

Lake Metroparks
Painesville Township Park – 1025 Hardy
Rd., Painesville Twp., OH 44077
Bluff Stabilization
Bid No. 2025-008



Lake County Probate Judge
Mark J. Bartolotta

Lake Metroparks Board of Park Commissioners
Gretchen Skok DiSanto
Frank J. Polivka
John C. Redmond, CPA

Executive Director
Paul Palagyi

January 10, 2025

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*** Bid Form must be purchased through SE Blueprint, Inc. 2035 Hamilton Avenue, Cleveland, Ohio 44114 (216) 241-2250 or www.seblueprint.com.**

INVITATION TO BID - LEGAL NOTICE

Sealed bids will be received at Lake Metroparks Administrative Offices, 11211 Spear Road, Concord Township, Ohio 44077 until **2:00 p.m.** local time, on **February 5, 2025** and thereafter will be publicly opened, read and recorded for the following:

NAME OF PROJECT: Painesville Township Park Hillside Bluff Stabilization

BID NUMBER: 2025-008

PRE-BID MEETING: January 23, 2025 at 2:00 pm. (1025 Hardy Road, Painesville Twp., OH 44077)

All documents, specifications, plans, etc., can be VIEWED AND PURCHASED at www.seblueprint.com. Copies may be PURCHASED for \$30.00 (Thirty Dollars), (non-refundable fee) through SE Blueprint, Inc., 2035 Hamilton Avenue, Cleveland, Ohio 44114, (216) 241-2250. A \$15 shipping/delivery fee is applicable for each set of Bidding Documents. Documents may also be REVIEWED, at Lake Metroparks Administrative Offices, 11211 Spear Road, Concord Township, Ohio 44077 or at www.lakemetroparks.com, click on "About Us".

Each bid (*\$50,000 or greater*) shall be accompanied by a Bid Guarantee in the form of either:

1. A certified check or cashier's check (Bid Check) made payable to "Lake Metroparks", in an amount equal to 10% of the bid amount conditioned to provide that if the bid is accepted the bidder will enter into a proper contract for the work; or
2. A Bid Guarantee and Performance Bond, for the full amount of the bid as provided in Section 153.571 of the Ohio Revised Code. A form of this bond is included in the Bidding Documents.

Bids must be submitted in sealed envelopes and clearly marked with the Bid No. and Project Title. No bid may be withdrawn before sixty (60) days have elapsed after the Bid Opening Date. This bond shall be written on an acceptable surety company authorized to do business in the State of Ohio and in an amount equal to 100% of the contract price. Bid guaranties of all unsuccessful bidders will be held until a proper contract is entered into or until all bids are rejected, as the case may be, and will be returned immediately thereafter. The successful bidder shall be required to file, at the time a contract is entered into, a Performance Bond and Labor and Material Payment Bond.

The Board intends to award a contract to the lowest and best bidder whose bid is submitted in accordance with the requirements of these bidding documents and does not exceed the funds available for the Project. The Board reserves the right to accept separate bids on various items of work, or to accept any combination of bids, or to reject any or all bids, and to waive any technical deficiencies or irregularities in bids.

BY THE ORDER OF **Lake Metroparks Board of Park Commissioners**
 Paul Palagyi, Executive Director

Published: News-Herald, SE Blueprint and www.lakemetroparks.com on **January 10, 2025**.

INSTRUCTION TO BIDDERS

1. Bidding Documents

1.1 Copies of the Contract Documents, including any Drawings and Specifications, may be obtained for bidding purposes upon the conditions set forth in the Invitation to Bid.

1.2 Persons or entities other than the bidder may view the Contract Documents at locations stated in the Invitation to Bid or at the office of the bidder. Persons or entities desiring additional information shall request such information from the bidder who shall then make a written request on its own letterhead to the Board for the additional information. The requesting person or entity shall bear the costs of printing and handling or any other cost arising from production of the requested information and shall be billed for printing costs directly by the printing company.

1.3 The bidder shall be responsible for advising any suppliers, subcontractors or sub-subcontractors of any alternates or changes to the Drawings and Specifications that may be issued as Addenda, and the Board assumes no responsibility for any bidder's failure to do so. The Board assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.

1.4 All prices and notations must be in ink or typewritten. Mistakes may be crossed out and corrections typed or printed adjacent to the mistake and initialed in ink by the person who signs bid. Prices shall be stated in units and quotations made separately on each item. In case of conflict, unit prices will govern. Where there is a conflict between words and figures, words will govern.

1.5 Bidders who have received this document from an outside source, not the Issuing Office (Lake Metroparks Planning Department), or obtained the documents from the Lake Metroparks website, should immediately contact the Issuing Office and provide their name, mailing address, email address, phone/fax number in order to be placed on the BIDDERS LIST. Bidders who fail to notify the Issuing Office with this information assume complete responsibility in the event that they do not receive communications from the Issuing Office prior to the closing date.

2. Bid Form

2.1 Bids must be made on the documents furnished in the Bid Documents. Each bid must contain the full name of all persons or entities submitting the bid and any parties-in-interest to such persons or entities.

2.2 Bids made by unincorporated entities or partnerships must set forth the name and place of residence or each principal or partner thereof, respectively.

2.3 Bids made by corporations must indicate the state of incorporation and the names and titles of officers having authority to sign the bid and Contract on behalf of the corporation. A copy of the corporate resolution authorizing those officers' signatures of the bid and Contract must be attached to the bid.

2.4 Proposals shall be addressed and sent to the address stated in the Invitation to Bid. Before the Board may consider any proposal, the Board must receive the proposal on or before the date and hour set for opening the bids. Conditions, limitations or provisions other than those expressly called for by any bidding document inserted as part of the proposal may cause the bid to be rejected by the Board.

2.5 Alterations of any Contract Document by erasure or interlineations must be explained or noted in such Contract Document over signature of bidder.

3. General Requirements

3.1 Bidders may bid on any or all parts of the Work and on any alternate described in the Contract Documents. Bidders may bid on any combination of contracts to be let in connection with the Project provided that the bidder must be engaged in the type of work for which the bid is submitted.

3.2 The Board reserves the right to accept bids in the combinations shown on the bid form, or to reject any or all bids, and to waive any technical deficiencies or irregularities in bids.

3.3. No contract will be awarded to any bidder who is in arrears to the Board for any debt or contractual obligation or who is in default as a surety or otherwise on any obligation owed to the Board.

3.4. Oral, telephonic or telegraphic bids are invalid and will not receive consideration.

3.5 The bidder shall submit a properly executed statement regarding personal property taxes in accordance with the enclosed statement entitled "Personal Property Tax Delinquency."

3.6 The Bidder (Prime Contractor) shall supply a minimum of 15% of the total labor force required to complete this Project, exclusive of supervisory and administrative personnel.

4. Bonds or Guaranties

(Note - Bid Guarantee and Performance Bond are only required on Bids/Proposals in excess of \$50,000)

4.1 A Bid Guarantee in the amount and manner prescribed in the Invitation to Bid shall accompany each bid.

4.2 The bidder shall furnish a Performance Bond and Labor and Material Payment Bond in the manner and amount prescribed in the Invitation to Bid.

4.3. The Board reserves the right to retain the Bid Guarantees of all bidders for a period of sixty (60) days after the bids are opened and read. During this sixty-day period, no bid may be withdrawn without the Board's permission or as otherwise provided by law. Bidders to whom contracts are awarded shall execute the contracts within (5) five days from the date of these bidders' receipt of notice of the contract award. Bidders whose Bid Guarantees are in a form other than the form set forth in section 153.571 of the Ohio Revised Code shall provide sureties in conjunction with execution of the contracts. Failure of any bidder to execute a contract or provide sureties within the time specified will be deemed an abandonment of the contract, will result in forfeiture by the bidder of its Bid Guarantee.

5. Examination of Drawings, Specifications and Work Site

5.1 Prior to submitting a bid, each bidder shall carefully examine the Drawings, Specifications and all other Contract Documents as well as visit the site of the Work to fully apprise itself of all conditions and limitations under which the Work will be performed. The bid shall reflect the costs of all items necessary to perform the Work. No allowances will be made to any bidder because of a lack of examination of the Contract Documents or inspection of the Work Site, and upon submission of the bid, the bidder shall be deemed to have made such examination and inspection.

6. Statement of Bidder's Qualifications

6.1 Each bidder shall complete and submit the enclosed "STATEMENT OF BIDDER'S QUALIFICATIONS".

7. Disclosures

7.1 The bidder to whom the Contract is awarded shall within seven (7) calendar days of notification of such award submit in writing to the Board the following information:

- (a) the nature and extent of Work to be performed by the bidder's own employees and forces;
- (b) the names of suppliers of principal items, systems, materials or equipment proposed to be used for the Work as well as the names and descriptions of such items, systems, materials or equipment; and
- (c) the names of any Subcontractors and Sub-subcontractors proposed to be used for any part of the Work.

7.2 Bidders shall establish to the satisfaction of the Board the reliability and capability of any proposed Subcontractors, Sub-subcontractor or supplier.

7.3 Persons or entities proposed by bidders to be Subcontractors, Sub-subcontractors or suppliers must perform the Work for which they were initially proposed and shall not be removed or replaced without prior written consent of the Board.

7.4 The qualifications of all subcontractors must be included in the bid package as noted in the detailed specifications.

8. Working Hours

8.1 Bids shall be based on the assumption that the Work will be performed on an eight (8) hour day, five (5) days a week basis. Any overtime expenses necessary to meet the construction schedule shall be borne by the contractor.

9. Administration of the Contract and Any Other Prime Contracts Relating to the Project

9.1 The Bidder awarded the General Trades Contract shall be the Contract Administrator and as such shall schedule and coordinate the work performed under its contract as well as any work performed under any other prime contracts relating to the Project. The Contract Administrator shall include in its bid all costs involved in the scheduling and coordination of such work, including but not limited to costs attributable to compiling progress reports.

9.2 The Contract Administrator shall schedule, coordinate and direct all phases of construction to ensure timely completion of the Project. All prime contractors and Subcontractors shall cooperate with the Contract Administrator in preparing the work schedule and maintaining construction progress in accordance with the schedule. They shall also provide requested information to the Contract Administrator on a monthly basis to assist the Contract Administrator in performing its responsibilities as such. Failure of any prime contractor or any Subcontractor to cooperate with the Contract Administrator shall be deemed by the Board to be a breach of contract by the party failing to so cooperate.

9.3 The Board shall not certify monthly payments for any prime contractor until it receives from the Contract Administrator certification that such prime contractor's work progress is satisfactory and that the prime contractor is completing its work according to the schedule prepared by the Contract Administrator.

9.4 Progress meetings shall occur on the same day and hour each week for the duration of the Project, or as otherwise agreed to by the Board, prime contractors and subcontractors. The Board shall distribute accurate minutes of these meetings to all prime contractors. Decisions reached at such meetings shall be binding upon all parties involved in the Project.

9.5 The Contract Administrator shall prepare and submit to the Board a progress schedule for the Project. Upon the Board's approval of the schedule, the Contract Administrator shall furnish four (4) copies to the Board. The schedule shall be revised monthly or as otherwise necessary to ensure timely completion of the Project. The schedule and all revisions thereof, as approved by the Board, shall be binding upon all parties involved in the Project.

9.6 The Contract Administrator shall coordinate the distribution of all Drawings for the Project. A copy of such Drawings shall be kept at the job site at all times.

10. Wage Rates

10.1 Any bidder awarded the Contract shall comply with the Wage Rate Requirements as described in Section 6 in Supplemental Instructions to Bidders in this this Document and ARTICLE 12 of the BOARD-CONTRACTOR AGREEMENT.

11. Discrimination

11.1 Any bidder awarded the Contract shall comply with ARTICLE 20 of the BOARD-CONTRACTOR AGREEMENT.

End of Instructions to Bidders

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

1. Questions about the Project

1.1 All questions concerning the Project shall be referred to:

Lake Metroparks Representative:

Seth Oldham
Park Planner
(440) 639-7275 ext. 1874
soldham@lakemetroparks.com

Consultant Representative:

David Pauling at KS Associates: paulingd@ksassociates.com

2. Pre-bid Conference

2.1 There will be a pre-bid conference for this project on the dates(s) listed below. Attendance is recommended.

<u>Date</u>	<u>Location</u>	<u>Time</u>
January 23, 2025	1025 Hardy Road, Painesville Twp., OH 44077	2:00 p.m.

3. Proposed Schedule for Project Completion

3.1 This schedule reflects the anticipated time required to complete the work defined in the specifications and shown on the drawings. Bidders are requested to submit with their bid, their proposed schedule for completion of the work described.

Advertised Public Bidding	January 10, 2025
Pre-Bid Conference	January 23, 2025
Bid Opening	February 5, 2025
Award of Bid by Board	February 12, 2025
Authorization to Proceed and Contracts	February 19, 2025
Construction to Commence	February 24, 2025
Substantial Completion	May 12, 2025
Punch List Completion	May 19, 2025
Occupancy by Lake Metroparks and Final Completion	May 26, 2025

The work shall commence no later than five (5) days after the Contractor's receipt of written notice to commence work, and, subject to authorized adjustments

4. Time of Completion

4.1 **Substantial Completion**, as defined in Paragraph 4.3 & 4.5 of Board –Contractor Agreement, shall be achieved not later than the date of May 12, 2025, but not later than the **Final Completion Date** of May 26, 2025.

5. Estimate of Cost

5.1 The following is an estimated range of cost for completing the project:

BASE BID TOTAL RANGE: \$465,925.00

6. Prevailing Wage Threshold Levels

6.1 Under guidelines established by AM Sub. H.B.350, if the Contract Sum under this Agreement exceeds the dollar thresholds established by the *Ohio Department of Employment Services - Wage and Hour Division*, the contractor(s) are required to conform to the prevailing wage rates as established by the Ohio Industrial Relations Board. Thresholds are to be adjusted biennially (every two years) by the Director of Ohio Department of Commerce.

Biennial adjustments to threshold levels are made according to the Price Deflator for Construction Index, United States Department of Commerce, Bureau of the Census.

6.2 Threshold Levels

“New” construction threshold for *Building Construction* – **\$250,000**

“Reconstruction, enlargement, alteration, repair, remodeling, renovation, or painting” threshold level for *Building Construction* – **\$75,000**

As of January 1, 2024:

“New” construction that involves *roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction* threshold level has been adjusted to – **\$98,974**

“Reconstruction, enlargement, alteration, repair, remodeling, renovation, or painting” that involves *roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction* threshold level has been adjusted to – **\$29,653**

6.3 The Prevailing Wage Determination Schedule for this project is available for review at the office of the Owner’s Prevailing Wage Coordinator, or for the complete Prevailing Wage information packet please contact:

Ohio Department of Commerce
Division of Industrial Compliance and Labor
Bureau of Wage and Hour Administration
6606 Tussing Road, PO Box 4009
Reynoldsburg, Ohio 43068-9009
614-644-2239

www.com.ohio.gov/laws/

6.4 Current prevailing wage rates are available through the Ohio Department of Commerce at the following link:

<http://www.com.ohio.gov/dico/>

Prevailing Wage Determination Cover Letter

County: LAKE
Determination Date: March 1, 2025
Expiration Date: June 1, 2025

THE FOLLOWING PAGES ARE PREVAILING RATES OF WAGES ON PUBLIC IMPROVEMENTS FAIRLY ESTIMATED TO BE MORE THAN THE AMOUNT IN O.R.C. SEC. 4115.03 (b) (1) or (2), AS APPLICABLE.

Section 4115.05 provides, in part: "Where contracts are not awarded or construction undertaken within ninety days from the date of the establishment of the prevailing wages, there shall be a redetermination of the prevailing rate of wages before the contract is awarded." The expiration date of this wage schedule is listed above for your convenience only. This wage determination is not intended as a blanket determination to be used for all projects during this period without prior approval of this Department.

Section 4115.04, Ohio Revised Code provides, in part: "Such schedule of wages shall be attached to and made a part of the specifications for the work, and shall be printed on the bidding blanks where the work is done by contract..."

The contract between the letting authority and the successful bidder shall contain a statement requiring that mechanics and laborers be paid a prevailing rate of wage as required in Section 4115.06, Ohio Revised Code. The contractor or subcontractor is required to file with the contracting public authority upon completion of the project and prior to final payment therefore an affidavit stating that he has fully complied with Chapter 4115 of the Ohio Revised Code.

The wage rates contained in this schedule are the "Prevailing Wages" as defined by Section 4115.03, Ohio Revised Code (the basic hourly rates plus certain fringe benefits). These rates and fringes shall be a minimum to be paid under a contract regulated by Chapter 4115 of the Ohio Revised Code by contractors and subcontractors. The prevailing wage rates contained in this schedule include the effective dates and wage rates currently on file. In cases where future effective dates are not included in this schedule, modifications to the wage schedule will be furnished to the Prevailing Wage Coordinator appointed by the public authority as soon as prevailing wage rates increases are received by this office.

"There shall be posted in a prominent and accessible place on the site of work a legible statement of the Schedule of Wage Rates specified in the contract to the various classifications of laborers, workmen, and mechanics employed, said statement to remain posted during the life of such contract." Section 4115.07, Ohio Revised Code.

Apprentices will be permitted to work only under a bona fide apprenticeship program if such program exists and if such program is registered with the Ohio Apprenticeship Council.

Section 4115.071 provides that no later than ten days before the first payment of wages is due to any employee of any contractor or subcontractor working on a contract regulated by Chapter 4115, Ohio Revised Code, the contracting public authority shall appoint one of his own employees to act as the prevailing wage coordinator for said contract. The duties of the prevailing wage coordinator are outlined in Section 4115.071 of the Ohio Revised Code.

Section 4115.05 provides for an escalator in the prevailing wage rate. Each time a new rate is established, that rate is required to be paid on all ongoing public improvement projects.

A further requirement of Section 4115.05 of the Ohio Revised Code is: "On the occasion of the first pay date under a contract, the contractor shall furnish each employee not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of Labor with individual written notification of the job classification to which the employee is assigned, the prevailing wage determined to be applicable to that classification, separated into the hourly rate of pay and the fringe payments, and the identity of the prevailing wage Coordinator appointed by the public authority. The contractor or subcontractor shall furnish the same notification to each affected employee every time the job classification of the employee is changed."

Work performed in connection with the installation of modular furniture may be subject to prevailing wage.

THIS PACKET IS NOT TO BE SEPARATED BUT IS TO REMAIN COMPLETE AS IT IS SUBMITTED TO YOU. (Reference guidelines and forms are included in this packet to be helpful in the compliance of the Prevailing Wage law.)

BID FORM

Bid Form documents can only be purchased from SE Blueprint, Inc.

SE Blueprint, Inc.
2035 Hamilton Avenue
Cleveland, Ohio 44114
seblue@seblueprint.com
(216) 241-2250 phone
(216) 241-2075 fax

Contents of Bid Form:

Price Sheet
Offer Sheet
Bidders Signature & Business Information
Request for Approved Equal
Affidavit of Non-Collusion
Affidavit of Delinquent Personal Property Tax Statement
Statement of Bidder's Qualifications & Experience
Bid Guarantee and Performance Bond
Checklist of Bid Proposal Forms

Contract Forms

The following forms shall be used during the contract:

LAKE METROPARKS BOARD-CONTRACTOR AGREEMENT

AIA DOCUMENT G702 AND G703, APPLICATION & CERTIFICATE FOR PAYMENT

AIA DOCUMENT G704, CERTIFICATE OF SUBSTANTIAL COMPLETION

AIA DOCUMENT G707, CONSENT OF SURETY COMPANY TO FINAL PAYMENT

OHIO LEGAL BLANK FORM 47, AFFIDAVIT OF ORIGINAL OR SUB-CONTRACTOR

OHIO LEGAL BLANK FORM 50 B, WAIVER OF LIEN

AFFIDAVIT OF PREVAILING WAGES



L A K E M E T R O P A R K S
B O A R D - C O N T R A C T O R A G R E E M E N T
11211 SPEAR ROAD, CONCORD TWP., OHIO 44077
(440) 639-7275

CONTRACT INFORMATION		
NAME OF CONTRACT:		
LOCATION:		
Bid No: _____	Bid Open: _____	Contract Amount: _____
P.O Number: _____	Board Approval: _____	Completion Date: _____

CONTRACTOR INFORMATION

BONDING / SURETY INFORMATION
Surety/Bond Company

MISCELLANEOUS INFORMATION	
SIGNED CONTRACT RECEIVED	_____
PERFORMANCE BOND	_____
WORKER'S COMP. CERTIFICATE	_____
CERTIFICATE OF INSURANCE	_____

BOARD-CONTRACTOR AGREEMENT

THIS AGREEMENT (AKA the "CONTRACT") is made between Lake Metroparks Board of Park Commissioners (the "BOARD") of the State of Ohio and **CONTRACTOR**. (the "Contractor") of the State of Ohio. This Contract shall be effective on the last date set forth on the signature page.

Article 1

THE CONTRACT DOCUMENTS

1.1 The Contract Documents consist of the Instructions to Bidders, if any, the bid of the Contractor (Including his bid guarantee), if any, the Contractor's performance bond, this Contract and all schedules and exhibits attached hereto, the Drawings, if any, listed on Schedule A hereto by issue date and revision date, the Specifications (both general and technical) contained in the Project Manual, if any, and any Addenda issued prior to the Execution of this Contract and modifications issued after execution of this Contract (such as Change Orders and Field Orders for minor changes in the Work). These form the binding Contract Documents if required by all. Capitalized terms used herein shall be defined as stated in Article 2 hereof or elsewhere in the Contract Documents. In the event of any inconsistency between this Contract and any of the other Contract Documents, the provisions of this Contract shall control. The intent of the Contract Documents is to include all labor, materials, equipment and other items necessary for the proper execution and completion of the Work and the terms and conditions of payment therefore. Work not covered in the Contract Documents will not be required unless it is consistent therewith and reasonably inferable there from as being necessary to produce the intended results. All of the Contract Documents form the total Contract, and all are as fully a part of the Contract as if attached hereto or repeated herein.

1.2 Nothing contained in the Contract Documents shall create any contractual relationship between the Board and any Subcontractor or Sub-subcontractor.

1.3 By executing this Contract, the Contractor represents that he has visited the site and familiarized itself with the local conditions under which the Work is to be performed.

Article 2

DEFINITIONS

2.1 The Project Manager will provide administration of the Contract and is an Authorized Agent of the Board. The Project Manager will have authority to act on behalf of the Board only to the extent provided in the Contract Documents.

2.2 Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. A sub-subcontractor is a person or entity who has a direct contract with any Subcontractor to perform any of the Work at the site.

2.3 Instructions to bidders are instructions contained in the bidding requirements for preparing and submitting bids for the Work.

2.4 Specifications are written descriptions of a technical nature of materials, equipment construction systems, standards and workmanship.

2.5 Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda become part of the Contract Documents when the Contract is executed.

2.6 Samples are physical examples furnished by the Contractor for the Project Manager's review and approval, which illustrate materials, equipment or workmanship, and which establish standards by which the Work will be judged.

2.7 Product Data is information furnished by the Contractor for the Project Manager's review and approval regarding materials or products to be used in the Work and which establish standards by which the Work will be judged.

2.8 Work comprises the completed structures, products or services, or any combination thereof, required by the Contract Documents, and includes all labor necessary to produce such structures, products or services, and all materials and equipment incorporated or to be incorporated in such structures, products or services.

2.9 Drawings and Plans are documents showing in graphic or pictorial form the design, location and dimension of the elements of the Work.

2.10 Application for Payment is the Contractor's written request for payment of amount due for completed portions of the Work and, if provided herein, for materials delivered and suitably stored pending their incorporation into the Work.

2.11 Project Manual is the manual containing any bidding documents, Specifications, and certain other Contract Documents.

2.12 Change Order is a written order to the Contractor, made and executed as provided in Article 17 hereof, issued after execution of the Contract, authorizing a Change in the Plans or an adjustment in the Contract Sum or the Contract Time.

2.13 Field Order is a written order issued by the Project Manager to the Contractor effecting minor interpretations of the Contract Documents or minor changes in the Work not involving an adjustment in the Contract sum or an extension of the Contract Time.

Article 3

THE WORK

3.1 The Contractor shall perform all Work required by the Contract Documents for **Lake Metroparks PROJECT**. As more fully described in Exhibit A hereto.

Article 4

TIME OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

4.1 The Work shall commence no later than five (5) days after the Contractor's receipt of written notice to commence work, and, subject to authorized adjustments, **Substantial Completion**, as defined in Section 4.3 hereof, shall be achieved no later than **DATE** (the "Contract time").

4.2 If the time for Substantial Completion is exceeded, the Board is hereby authorized to deduct and retain out of the payments that may be due or become due the Contractor liquidated damages, and not as a penalty, for each and every day the Work is delayed beyond the time so stipulated, it being understood and agreed that actual

damages would be difficult to ascertain with precision in any such case and that the amount of such liquidated damages bears a reasonable relationship to the actual damages that may be projected.

Liquidated Damages will be based on Original Contract Amount.

Original Contract Amount		Damages to be deducted for each calendar day of overrun
(From) \$0	(To and Including) \$50,000	\$25.00
\$50,001	\$100,000	\$50.00
\$100,001	\$300,000	\$100.00
\$300,001	\$500,000	\$200.00
\$500,001	\$750,000	\$325.00
\$750,001	\$1,000,000	\$450.00
\$1,000,001	\$1,500,000	\$625.00
\$1,500,001	\$2,000,000	\$875.00
OVER	\$2,000,000	\$1,000.00

4.3 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Board can occupy or utilize the Work for its intended use (subject only to minor punch list items which will not unreasonably interfere with the Board’s full use, occupancy and enjoyment of the Project site), and all required occupancy permits, if any, have been issued. The Contractor shall thereafter use due-diligence to complete such minor punch list items to the end that Final Completion will be achieved within fourteen (14) days after Substantial Completion and shall cause the least possible interference with the Board, its employees and guests.

4.4 The Date of Substantial Completion of the Work is the date upon which the Board can occupy or utilize the Work for the use for which it is intended or upon which in all material respects it serves the purpose for which it was intended.

Article 5

CONTRACT SUM

5.1 The Board shall pay the contractor for the performance of the Work subject to deductions and additions by properly authorized written Change Orders as provided herein, the Contract Sum of **AMOUNT (\$)**. (Bid Amount in Lump Sum).

The Contract Sum is determined as follows:

1.	Item 1 Base Bid	\$ XXX
	TOTAL, Not to Exceed	\$ XXX

5.2 Unless otherwise directed by the contract documents, the Contractor shall include in the Contract Sum any Contingencies stated in the Contract Documents. Items covered by this Contingency shall be supplied for such amounts and by such persons as the Board may direct.

A. The Contingency shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the Contingency delivered at the site.

B. The Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original contract shall be included in the Contract Sum and not in the Contingency.

C. Whenever the cost is more than or less than the Contingency, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

5.3 Within the Schedule of Items, several items may have cash Contingency assigned to them. This Contingency is ONLY an Estimate of what the item may actually cost. The final actual cost of the item(s) may be higher or lower than what is shown for the Contingency. The contractor will be paid ONLY for what is finally and actually installed. The contractor will provide all necessary documentation, invoices, receipts, time cards, payroll records, shipping tickets, records, data, etc. That indicates the actual and final cost of the item(s). If the actual and final cost of the item(s) is less than what is indicated in the Contingency amount, the Board shall receive a credit. If the actual and final cost of the item(s) is more than what is indicated in Contingency amount, the contractor will receive the correct amount, provided that all invoices and records, etc. are submitted to the Board.

Article 6

PROGRESS PAYMENTS

6.1 Based upon Applications for Payment submitted by the Contractor, the Project Manager may make progress payments on account of the Contract Sum.

6.2 Application for progress payments may be made on intervals as requested by the Contractor, but not more frequently than monthly.

6.3 Before the first Application for Payment, the Contractor shall submit to the Project Manager a schedule that apportions the lump sum price to the major components forming the work which schedule shall be prepared in such form and supported by such data to substantiate its accuracy as the Project Manager may require. This schedule, unless objected to by the Project Manager, shall be used only as a basis for the Contractor's applications for payment.

6.4 At least fourteen (14) days before the date for each progress payment, the Contractor shall submit to the Project Manager an itemized Application for Payment, notarized, supported by such data substantiating the Contractor's right to payment as the Project Manager may require, and reflecting retainage, if any, as provided in the Contract Documents.

6.5 The Project Manager will, within forty-five (45) days after the receipt of the Contractor's application for payment, either pay the amount that the Project Manager determines is properly due, or notify the Contractor in writing of the reasons for withholding payment.

6.6 No progress payment, nor any partial or entire use or occupancy of the Work by the Project Manager shall constitute an acceptance of any work not in accordance with the Contract Documents.

6.7 Progress payments for acceptable labor and work in place shall be made at the rate of ninety percent (90%) of the total amount approved by the Project Manager as an estimated progress payment, less former payments therein, provided that said work in place is free from any attested accounts, or from any claims for damages that might in any manner become a liability or charge against the Board, and except as herein provided, the allowance of such estimates shall not be deemed a final acceptance of the work or material therein included. The Project Manager upon receipt of the Contractor's lien waivers from the contractor and his subcontractors, that indicate any and all liens and encumbrances on the Work have been fully discharged, will make such progress payments.

6.8 Retainage held, in order to ensure the faithful and proper performance of the Contract, shall be deposited in an escrow account as designated in Section 153.63 of the Ohio Revised Code. The escrow instructions to the escrow agent shall be in conformance with the provisions of this Contract and with Sections 153.13 and 153.63 of the Ohio Revised Code. This Section 6.8 shall not apply to contracts the total cost of which is less than fifteen thousand dollars (\$15,000).

6.9 If the Contractor fails to comply with the terms of any of the Contract Documents, or with the orders or directions of the Project Manager as provided herein, the Project Manager reserves the right to withhold any payment that may be due until such terms, orders or directions have been complied with to the satisfaction of the Project Manager.

6.10 Payments may be withheld on account of (1) defective work not remedied, (2) claims filed, (3) failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment, (4) damage to the Project Manager or another contractor, or (5) persistent failure to carry out the Work in accordance with the Contract Documents.

Article 7

FINAL PAYMENT

7.1 The Project Manager shall make final payment, constituting the entire unpaid balance of the Contract Sum, to the Contractor when the Work has been completed, the Contract fully performed, and any and all liens and encumbrances released and discharged.

7.2 Final payment shall not be due until the Project Manager determines that Substantial Completion of the Work has occurred and the Contractor has delivered to the Project Manager a complete release of all liens and encumbrances arising out of this Contract and/or the Work or receipts in full covering all labor, materials and equipment for which a lien could be filed, or a bond satisfactory to the Project Manager indemnifying it against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Project Manager all moneys the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees, if any liens remain unsatisfied prior to final payment to contractor, the Project Manager shall retain those funds until all appropriate executed and notarized lien waiver(s) are provided.

7.3 The making of final payment shall constitute a waiver of all claims by the Project Manager except those arising from (1) potential or unsettled liens, (2) faulty or defective Work appearing after Substantial Completion, (3) failure of the Work to comply with the requirements of the Contract Documents, or (4) terms of any special warranties required by the Contract Documents. The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final application for payment.

Article 8
THE BOARD

8.1 The Board shall at all times have access to the Work wherever it is in preparation and progress.

8.2 Based on the Board's observations and an evaluation of any application for payment, the Board will determine the amounts owing to the Contractor in accordance with Article 6.

8.3 The Board may reject Work that does not conform to the Contract Documents.

8.4 To the extent required for the Work, the Board shall furnish all surveys and a legal description of the site.

8.5 Except as provided in Section 9.5, the Board shall secure and pay for any approval, easement, assessment or charge required for any construction, use or occupancy of any permanent structure or permanent change in any existing facility.

8.6 The Board shall forward all instructions directly to the Contractor.

8.7 If the Contractor fails to correct defective Work or persistently fails to carry out the Work in accordance with the Contract Documents, The Board, by written order, may order the Contractor to stop the Work or any portion thereof, until the cause for such order has been eliminated; however, this right of the Board to stop the Work shall not give rise to any duty on the part of the Board to exercise this right for the benefit of the Contractor or any other person or entity.

Article 9
THE CONTRACTOR

9.1 The Contractor shall supervise and direct the Work using its best skill and attention and shall be solely responsible for all means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

9.2 Unless otherwise specifically provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

9.3 The Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him.

9.4 The Contractor warrants to the Board that all materials and equipment incorporated in the Work will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements may be considered defective.

9.5 Unless otherwise indicated in the Contract Documents, the Contractor shall secure and pay for any building permit and for all other permits and governmental fees, licenses and inspections necessary for the proper execution and completion of the Work.

9.6 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the Work, and shall promptly notify the Board if the Drawings and Specifications, of any, are at variance therewith.

9.7 The Contractor shall be responsible to the Board for the acts and omissions of its employees and Subcontractors and their agents and employees, and any other persons performing any of the Work under a contract with the Contractor.

9.8 The Contractor shall review, approve and submit any Drawings, Product Data and Samples required by the Contract Documents. The Work shall be in accordance with approved submittals.

9.9 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by its operations. At the completion of the Work, it shall remove all of its waste materials and rubbish from and about the Work site as well as its tools, equipment, machinery and surplus materials.

9.10 The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent, copyright, trade secured or other proprietary rights and shall save the Board harmless from loss on account thereof.

9.11 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Board and its agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense

A. is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, including but not limited to the Work itself, including the loss of use resulting there from, and

B. is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Section 9.11. In any and all claims against the Board or any of its agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by either of them, or anyone for whose acts either of them may be liable, the indemnification obligation under this Section 9.11 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers or workmen's compensation acts, disability benefit acts or other employee benefit acts.

Article 10

SUBCONTRACTS

10.1 Unless otherwise required by the Contract Documents or the Bidding Documents, the Contractor, within seven (7) days of being awarded the Contract, shall furnish to the Board in writing the names of any Subcontractors for each of the principal portions of the Work. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection. Contracts between the Contractor, which are to be performed by a Subcontractor, shall include language that shall bind the subcontractor to the same terms of the contract documents as to which the contractor is bound and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by such Contract Documents, assumes toward the Board.

Article 11

INSURANCE

11.1 The Contractor agrees to provide and maintain at its own expense, worker's compensation coverage that is in compliance with the laws of the State of Ohio.

A. The Contractor also agrees to provide and maintain, at its own expense, Contractor's general liability insurance, covering premises operations, underground, explosion and collapse hazards, products/completed operation, contractual liability, independent contractor's liability, broad form property damage liability, personal injury liability with the employee exclusion deleted, incidental malpractice and extended bodily injury. The Board is to be named as additional insured under the policy, and certification shall be provided prior to the award of the Contract.

B. Limits of liability for general liability coverage shall be a minimum of \$1,000,000 combined single limit - bodily injury and property damage liabilities combined. The Board must be provided a minimum of (30) thirty days' notice of cancellation by the insurance carrier.

C. The Contractor shall also provide automobile liability insurance at limits not less than \$1,000,000 combined single limit - bodily injury and property damage liabilities combined. Coverage must be extended to provide protection for liabilities arising from the use of hired or non-owned automobiles. Any fellow employee exclusion must be deleted. The Board must be named as additional insured under this policy, with certification and endorsement provided prior to the award of Contract. The Board must be provided a minimum of thirty (30) days' notice of cancellation by the insurance carrier.

11.2 The Board shall be responsible for purchasing and maintaining its own liability insurance and, at its option, may maintain such insurance as will protect it against claims which may arise from operations under the Contract.

Article 12

WAGE RATES

12.1 The Contractor and any Subcontractor shall comply with Chapter 4115 of the Ohio Revised Code. Failure by the Contractor to so comply will be deemed by the Board to be a breach of contract. A schedule of the wage rates applicable under said chapter will be furnished to the Contractor by the Board upon request, if such schedule is not included in any Project Manual. The Contractor and any Subcontractor must submit, before beginning performance under this Contract, a schedule of the dates upon which wage payments are to be made, and for each such date thereafter, a copy of his or its complete payroll for that date, exhibiting for each employee his name, current address, social security number, number of hours worked per day and for the week, his hourly rate of pay, job classification, fringe benefits and deductions from wages. The Contractor and any Subcontractor must file with the Board upon completion of the Work and prior to final payment therefore an affidavit stating that it has complied with Chapter 4115 of the Ohio Revised Code. This Section 12.1 shall apply only if the Contract Sum under this Contract exceeds the dollar thresholds established by the Ohio Department of Commerce, Division of Industrial Compliance, Bureau of Wage and Hour.

As of January 1, 2014

New Construction has been adjusted to **\$84,314**.

“New” construction that involves roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction threshold level.

Reconstruction has been adjusted to **\$25,261**.

“Reconstruction, enlargement, alteration, repair, remodeling, renovation, or painting” that involves roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction threshold level.

The Prevailing Wage Determination Schedule for this project is available for review at the office of the Owner’s Prevailing Wage Coordinator and via the internet at <http://www.com.ohio.gov/dico/default.aspx>.

Article 13

WORK BY BOARD OR BY SEPARATE CONTRACTORS

13.1 The Board reserves the right to perform work related to the Work with its own personnel, and to award separate contracts in connection with portions of the Work or other work on the site. If the Contractor claims that delay or added cost is involved because of such action by the Board, he shall make such claim as he would under Section 17.4 hereof.

13.2 The Contractor shall afford the Board reasonable opportunity for the introduction and storage of their materials and equipment for the execution of their work, and shall coordinate its work with theirs.

Article 14

TIME

14.1 All time limits stated in the Contract Documents are of the essence. The Contractor shall expedite the Work and achieve Substantial Completion within the Contract Time.

14.2 If the Contractor is delayed at any time in the progress of the Work by changes ordered in the Work, labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipated, unavoidable casualties, or any causes beyond the Contractor's control, then the Contract Time shall be extended by Change Order for such reasonable time as the Board may determine.

Article 15

PROTECTION OF UNDERGROUND UTILITY FACILITIES

15.1 If the Work affects or otherwise involves underground utility facilities, both the Board and the Contractor shall adhere to the requirements of Section 153.64 of the Ohio Revised Code.

Article 16

PROTECTION OF PERSONS AND PROPERTY

16.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. It shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to

- A. All employees on the Work and other persons who may be affected thereby,
- B. All the Work and all materials and equipment to be incorporated therein, and
- C. Other property at the site or adjacent thereto.

He shall give all notices and comply with all applicable laws, ordinances, rules, regulations and orders of any public authority bearing on the safety of persons and property and their protection from damage, injury or loss. The Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Contractor,

any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The foregoing obligations of the Contractor are in addition to its obligations under Article 9.

Article 17

CHANGES IN THE PLANS

17.1 The Board, without invalidating the Contract, may order Changes in the Plans, consisting of additions, deletions, or modifications, the Contract Sum and the Contract Time being adjusted accordingly. All such Changes in the Plans shall be authorized by written Change Order, signed by the Board prior to any alleged Work commencing.

17.2 The Contract Sum and the Contract Time may be changed only by Change Order.

17.3 If the Contractor wishes to make any claim/proposal for an increase in the Contract Sum, because of claimed/proposed extra work, concealed conditions, or for any reason, no such claim/proposal for payment over and above the Contract Sum shall be authorized or valid unless each of the following occurs:

- A. A written claim/proposal is made by the Contractor to the Board within twenty (20) days of the occurrence or event giving rise to the claim/proposal.
- B. The claim/proposal is filed prior to proceeding with the claimed/proposed extra work; and
- C. A written Change Order is issued, agreed to and signed by the Board/Project Manager.

17.4 The Contractor agrees that he shall have no compensation or claim/proposal for extra work that will increase the Contract Sum unless and until the procedures set forth above are followed and approved, and the Contractor hereby agrees that any claim/proposal for an increase in the Contract Sum will not be made and is waived and invalid hereunder, unless and until the procedures set forth above are followed and a duly approved written Change Order is issued prior to proceeding with any alleged extra work.

Article 18

CORRECTION OF WORK

18.1 The Contractor shall promptly correct any Work rejected by the Board as defective or as failing to conform to the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. Such correction shall be completed within the time period agreed to by the Board. The provisions of this Article 18 apply to Work done by any Subcontractor of Sub-subcontractor as well as to Work done by employees of the Contractor.

Article 19

TERMINATION OF THE CONTRACT

19.1 If the Contractor defaults or persistently fails or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision of the Contract, the Board, after seven days' written notice to the Contractor and without prejudice to any other remedy it may have, may make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor or, at its option, may terminate the Contract and take possession of the site and of all materials, equipment, tools, and any construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever method it may deem expedient, and if the unpaid balance of the Contract Sum exceed the expense of finishing the Work, such excess shall be paid to the Contractor, but if such expense exceeds such unpaid balance, the Contractor shall pay the difference to the Board.

Article 20

DISCRIMINATION

20.1 The Contractor agrees:

A. That in the hiring of employees for the performance of work under this Contract or any subcontract, neither it nor any Subcontractor or Sub-subcontractor or any person acting on behalf of it or any Subcontractor or Sub-subcontractor shall, by reason of race, creed, sex, handicap, or color, discriminate against any citizen of the state who is qualified and available to perform the work to which the employment relates; and

B. That neither it nor any Subcontractor or Sub-subcontractor or any person acting on behalf of it or any Subcontractor or Sub-subcontractor shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this Contract on account of race, creed, sex, handicap, or color.

Article 21

MISCELLANEOUS PROVISIONS

21.1 Governing Law: This agreement shall be governed by the laws of the State of Ohio. Any claims, actions or causes of action that arise out of this agreement shall be brought in Lake County, Ohio. In signing this contract, the parties agree that venue for any claims shall be resolved solely by recourse to the Courts of Lake County, Ohio.

21.2 Written Notice: Written notice shall be deemed to have been served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

21.3 Board's Right To Clean Up: If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by the detailed specifications, the Board may clean up and charge the cost thereof to the contractors responsible therefore as it shall deem to be just.

21.4 Independent Contractor Acknowledgement: All individuals employed under this contract that provide services to Lake Metroparks are not considered public employees for the purpose of Ohio Public Employees Retirement System (OPERS) membership.

Article 22

GUARANTEE

22.1 The Contractor or the work as called for in the contract documents, in consideration of the price bid and the payments received or to be received, guarantees that all work done and all material used in the project under contract are in all respects first-class, of the proper kind and quality and has been done and is being done in accordance with the requirements of the contract documents, and also guarantees that the improvements will remain in good condition for and during the entire period of guarantee.

22.2 The period of guarantee shall begin upon the date of final acceptance by the Board in writing, of the construction work, and shall continue for a period of twelve (12) months thereafter or as otherwise provided in the general conditions.

22.3 If at any time before or during said period of guarantee, any defects or omissions become apparent in the work, or if it becomes apparent that any of the work is not in accordance with the requirements of the contract documents, or if any of the work constructed under this contract requires repairs due to defects in materials or workmanship, or for any other cause which may be attributed to the work which is being done by the Contractor, the Board or its authorized representative, will notify the Contractor to rectify such defects or omissions, or to make the repairs so required.

22.4 If the Contractor shall fail to begin to rectify such defects or omissions or to start such repairs within five (5) days from the date of such notification, or if such rectification or repair work is not made in a manner satisfactory to the Board or to its representative, the Board shall have the right to purchase any necessary materials, rent any necessary tools and equipment and to employ such other person or persons as may be deemed proper to make such repairs, and to pay the expense thereof out of moneys then due, or which may thereafter become due to the Contractor, or out of the amount retained for that purpose by the Board.

22.5 If moneys to correct defects, omissions or to resolve any guarantee issues are not sufficient to meet such expense, the additional moneys shall be furnished by the Contractor, and if he refuses or neglects to provide the necessary moneys, they shall be provided by his sureties.

22.6 If it is necessary to remove any part of the work to rectify defects or omissions or to repair defects in materials or workmanship, or if any part of the work becomes damaged due to such rectification or repairing, all such shall be replaced or repaired, all to the satisfaction of the Director or said representative. The guarantee provisions shall also apply to all rectified or repaired work.

Lake Metroparks Board of Park Commissioners
11211 Spear Road, Concord Twp., OH 44077

Witness Paul Palagyi, Executive Director _____ Date

and by
NAME
ADDRESS
ADDRESS

Witness **CONTRACTOR** _____ Date

EXHIBIT A

The Work consists of providing of all labor, materials, equipment, appliances and services necessary, including those reasonable inferred,

SAMPLE

APPLICATION AND CERTIFICATE FOR PAYMENT

Invoice #:

Page 1 of 2

To Owner: LAKE METROPARKS
11211 Spear Road
Concord Twp, OH 44077
Paul Palagyi

Project:

Application #:

Distribution to :

	Owner
	Architect
	Contractor

Period To:

From Contractor:

Project Nos:

Via (Architect):

Contract Date:

Contract For:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contact. Continuation Sheet is attached.

1. Original Contract Sum	\$	-
2. Net Change By Change Order	\$	-
3. Contract Sum To Date	\$	-
4. Total Completed and Stored To Date	\$	-
5. Retainage :		
a. 10.00% of Completed Work	\$	-
b. 10.00% of Stored Material	\$	-
Total Retainage	\$	-
6. Total Earned Less Retainage	\$	-
7. Less Previous Certificates For Payments		
8. Current Payment Due	\$	-
9. Balance To Finish, Plus Retainage	\$	-

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: 0

By: _____ Date: _____

State of: _____ County of: _____
Subscribed and sworn to before me this _____ day of _____

Notary Public:
My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the contract Documents, based on on-site observations and the data comprising the above application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ -

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this application on the Continuation Sheet that are changed to conform with the amount certified)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	Additions	Deductions
Total changes approved in previous months by Owner		\$ -
Total Approved this Month	\$ -	
TOTALS	\$ -	\$ -
Net Changes By Change Order		\$ -

CONTINUATION SHEET

Application and Certification for Payment, containing

Application No. : 0

Contractor's signed certification is attached.

Application Date :

In tabulations below, amounts are stated to the nearest dollar.

To:

Use Column I on Contracts where variable retainage for line items may apply.

Architect's Project No.:

Invoice # :

Contract :

A Item No.	B Description of Work	C Scheduled Value	D Work Completed From Previous Application (D+E)	E Work Completed This Period In Place	F Materials Presently Stored (Not in D or E)	G Total Completed and Stored To Date (D+E+F)	H % (G / C)	I Balance To Finish (C-G)	J Retainage
					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
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					\$ -	\$ -	#DIV/0!	\$ 0.00	\$ -
Page Totals		\$ -	\$ -	\$ -	\$ -	\$ -	#DIV/0!	\$ -	\$ -



CERTIFICATE OF SUBSTANTIAL COMPLETION

Project / Bid Number:

Contract Date:

Final Contract Amount:

Owner: Lake Metroparks 11211 Spear Road Concord, Ohio 44077	Contractor:
---	--------------------

- This Certificate of Substantial Completion **applies to all Work** under the Contract Documents.
- This Certificate of Substantial Completion **applies to the following specified parts of** the Contract Documents.
Documents:

The Work in which this Certificate applies has been inspected and reviewed by authorized representatives of the Owner, Contractor and Architect/Engineer and found to be substantially complete, and is also the date of commencement of applicable warranties required by the Contract Documents, except as attached. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the owner can occupy or utilize the Work for intended use.

The date of **Substantial Completion** of the Project or portion thereof designated above is hereby established as

Date

- A "Punch-List" of items to be completed or corrected is listed below. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The Contractor shall complete or correct the Work within **XX** days from the above date of Substantial Completion.

"Punch-List" items:

Lake Metroparks will issue a Final Completion Certificate upon the acceptance of the Work or designated portion thereof as determined by the Owner, Contractor and Architect/Engineer as complete. Upon this time Final Payment will be authorized and Lake Metroparks will assume full possession.

OR

Lake Metroparks accepts the Work or designated portion thereof as substantially complete and will assume full possession thereof at (location) --, on (date) --.

Signature

Paul B. Palagy
 Lake Metroparks
 Executive Director
 Date:

Signature

Name
 Lake Metroparks
 Project Manager
 Date:

Signature

Name
Company
Title
 Date:

This certification does not constitute an acceptance of Work NOT in accordance with the Contract Documents nor is it a release of contractor's obligation to complete the work in accordance with the Contract Documents. Lake Metroparks and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.

**CONSENT OF SURETY
TO FINAL PAYMENT**

AIA Document G707

(Instructions on reverse side)

- OWNER
- ARCHITECT
- CONTRACTOR
- SURETY
- OTHER

TO OWNER:
(Name and address)

ARCHITECT'S PROJECT NO.:

CONTRACT FOR:

PROJECT:
(Name and address)

CONTRACT DATED:

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of
any of its obligations to
(Insert name and address of Owner)

, CONTRACTOR,

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

(Printed name and title)

Attest:
(Seal):



CAUTION: You should sign an original AIA document that has this caution printed in red. An original assures that changes will not be obscured as may occur when documents are reproduced. See Instruction Sheet for Limited License for Reproduction of this document.



AFFIDAVIT OF (SUB OR ORIGINAL) CONTRACTOR

Ohio _____, 20____

STATE OF OHIO, _____ COUNTY, ss:

_____ being first duly sworn says that he is
_____ of _____

the (Sub/Original) Contractor having a contract with LAKE METROPARKS, the OWNER for

Situated on or around or in front of the following described property:

_____ whereof

LAKE METROPARKS was the OWNER.

Affiant further says that the following shows the names of every sub-contractor in the employ of said

_____ giving the amount, if any, which is due, or to become due, to them, or any of them, for work done or machinery, material or fuel furnished to date hereof, under said contracts.

NOTE: This statement must be accompanied by a similar sworn statement signed by each of the sub-contractors listed below.

SUB-CONTRACTORS

Name	Trade	Amount due or to become due for work and material furnished to date hereof

Said affiant further says that the following shows the names of every person furnishing machinery, material or fuel to _____ giving them the amount, if any, which is due, or to become due, to them, for machinery, material or fuel furnished to date hereof, under said contracts.

MATERIAL MEN

Name	Trade	Amount due or to become due for work and material furnished to date hereof

AFFIDAVIT OF (SUB OR ORIGINAL) CONTRACTOR

Said affiant further says that the following shows the names of every unpaid laborer in the employ of _____ furnishing labor under said contract, giving the amount, if any, which is due, or to become due, for labor done to date hereof.

Name	Trade	Amount due or to become due for labor furnished to date hereof

That the amounts due or become due to said sub-contractors, material men and laborers, for work done, or machinery, material or fuel furnished to date hereof, to _____ Is fully and correctly set forth opposite their names, respectfully, in the aforesaid statements, and further evidenced by certificates of every person furnishing machinery, material or fuel, hereto attached, and made a part hereof.

Affiant further says that _____ has not employed or purchased or procured machinery, material or fuel from, or sub-contracted with any person, firm or corporation, other than those mentioned above, and owes for no labor performed, or machinery or fuel furnished under said contracts, other than above set forth.

Name / Title

Sworn to before me and subscribed in my presence, at _____, Ohio, this _____ day of _____, 20____.

Notary Public

Ohio, _____, 20____

The undersigned certifies that to date hereof that have furnished machinery, material or fuel as set out herein to _____ for

Situated on or around or in front of the property described in the foregoing affidavit; that the nature of said machinery, material or fuel furnished, the date when they commenced furnishing the same and the amount now due or owing to each of them, is correctly stated and set opposite their respective names or that have been paid in full, if so acknowledged hereon.

Name	Machinery, materials or fuel and nature of the same	Commenced Furnishing	Amount due or to become due to date hereof.

WAIVER OF LIEN

To All Whom It May Concern:

In consideration of the FINAL sum of _____ dollars,
Written words

\$ _____, and other valuable consideration in hand paid, the receipt where of is hereby acknowledged, the undersigned does hereby waive, release and relinquish any and all liens or claims, right to lien or claim, for labor or materials, or both, furnished to date hereof, for premises known and described as follows:

Lake Metroparks Project: _____

Project Address: _____

Contractor/Sub-Contractor Name

Trade

Witness the hand and seal given this _____ day of _____, 20____,

City of _____ County of _____ State of _____.

Address

Authorized Agents' Name (print)

Signature of Authorized Agent

State of Ohio _____ County of _____

Subscribed and sworn to before me by _____

This _____ day of _____, 20____.

Notary Public _____

My commission expires _____.

(seal)

AFFIDAVIT OF PREVAILING WAGES

I, _____, of
(Print Name)

(Company name & address)

do hereby certify that the wages paid to all employees for the full number of hours worked in connection with the Contract to the Improvement, Repair and Construction of:

(Project and Location)

during the following period, from _____ to _____ is in accordance with the prevailing wage prescribed by the contract document.

I further certify that no rebates or deductions for any wages due any person have been directly or indirectly made other than those provided by law.

Name (print)

Signature of Officer or Agent

Sworn to and subscribed in my presence this _____ day of _____, 20____.

(Notary Public)

The above affidavit must be executed and sworn to by the officer or agent of the Contractor or Subcontractor who supervises the payment of employees, before the Board will release the surety and/or make a final payment due under the terms of the Contract.

Schedule "A"
List of Drawing Index

Drawing Number & Title

Title Sheet	1
General Notes	2
Existing Site Plan	3
Proposed Site Plan	4
Location Map	5
Sections	6
Elevation View	7
Details	8
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Redi-Rock Details	10
Site Access Plan	11

SECTION 01 30 00

ADMINISTRATIVE PROVISIONS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED:

- 1.1.1 Title of Work and Type of Contract
- 1.1.2 Contractor Use of Premises
- 1.1.3 Coordination
- 1.1.4 Field Engineering
- 1.1.5 Reference Standards

1.2 WORK COVERED BY CONTRACT DOCUMENTS:

- 1.2.1 Base Bid: Work of this Contract comprises general construction of new Bluff Stabilization at Painesville Township Park including pre-cast modular wall, steel sheet piling bulkhead, installation of a rock drain, and site restorations as shown in the Contract Drawings.

1.3 CONTRACT METHOD:

- 1.3.1 Construct the work under lump sum.
- 1.3.2 Owner will enter into separate contracts for work with the Contractor. The Contract form will be provided by Lake Metroparks.

1.4 CONTRACTOR USE OF PREMISES:

- 1.4.1 Limit use of premises for work and for construction operations to the area depicted in the Contract Documents. Contractor shall make arrangements with Owner for transportation of all construction materials and equipment to the site. All work and operations shall be coordinated with the Owner.
- 1.4.2 At the end of work by the Contractor, Contractor shall be responsible for all damages caused by construction of the project and shall be responsible for restoring any damaged areas to their original condition (before construction started). To facilitate determination of damages, contractor shall photograph work area with 35 mm camera, digital camera or video camera prior to starting work and provide Owner with one set of prints or video tape.

1.5 APPLICATION FOR PAYMENT:

- 1.5.1 Follow procedures described on the Contract for payment application processes.

1.6 COORDINATION:

1.6.1 Coordinate work of the various Sections of Specifications to assure efficient and orderly sequences of installation of construction elements, with provisions for accommodating items installed later.

1.6.2 Site access shall be provided at locations listed on the contract drawings.

1.7 FIELD ENGINEERING:

1.7.1 Contractor field engineering services: establish grades, lines, and levels, by use of recognized engineering survey practices.

1.7.2 Locate and protect control and reference points and establish new points as required.

1.8 REFERENCE STANDARDS:

1.8.1 For products specified by association or trade standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

1.8.1 The date of the standard is that which is in effect as of the Bid date.

1.8.3 Obtain copies of standards when required by Contract Documents. Maintain copy at jobsite during progress of the specific work.

END OF SECTION

SECTION 01 30 10 – CERTIFIED PAYROLL FILING

PART 1 – GENERAL

1.1 SCOPE

- A. The General Terms and Conditions require the CONTRACTOR and every lower-tier Subcontractor to submit certified payrolls and labor compliance documentation.
- B. The CONTRACTOR shall submit payroll reports for the CONTRACTOR and all applicable Subcontractors with each CONTRACTOR PAYMENT REQUEST, which reports shall be certified by the CONTRACTOR that the payroll is correct and complete, and the wage rates shown are not less than those required by the Sections 4115.03 to 4115.21, ORC, or the Davis-Bacon Act, as applicable. The CONTRACTOR is responsible for submitting all payroll reports of the CONTRACTOR'S SUBCONTRACTORS.
 - 1. Each payroll report shall indicate the period covered and shall include a list containing the name, address and social security number of each employee of the Contractor and the Contractor's Subcontractors paid for the Work.
 - 2. Each payroll report shall list the number of hours each employee worked each day on the Project during the reporting period, the total hours each week on the Project, the employee's hourly rate of pay, job classification, fringe benefits and all deductions from wages and net pay.
- C. Each payroll report shall also list each fringe benefit and state if it is paid as cash to the employee or to a named plan.
- D. The Contractor and all Subcontractors shall also submit apprenticeship agreements for all apprentices utilized on the Project.

1.2 SUBMITTALS

- A. The CONTRACTOR shall submit certified payroll reports monthly.

1.3 QUALITY ASSURANCE—NOT USED

1.4 DELIVERY, STORAGE AND HANDLING—NOT USED

1.5 PROJECT SITE CONDITIONS

- A. Questions regarding specific certified payroll issues please contact the OWNER'S Prevailing Wage Officer.

PART 2 – PRODUCTS

(Not used)

PART 3 – EXECUTION

(Not used)

END OF SECTION

SECTION 01 31 19

PRECONSTRUCTION CONFERENCE

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED:

1.1.1 Contractor participation in preconstruction conferences.

1.2 RELATED REQUIREMENTS:

1.2.1 Section 01 30 00 – Administrative Provisions.

1.3 PRECONSTRUCTION CONFERENCE:

1.3.1 Owner will schedule conference within 10 days after Notice of Award.

1.3.2 Attendance: Owners or owners' representative, Engineer, Contractor and Subcontractors.

1.3.3 Agenda:

1.3.3.1 Distribution of Contract Documents

1.3.3.2 Submittal of list of Subcontractors, and construction progress schedule

1.3.3.3 Designation of responsible personnel

1.3.3.4 Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, and change orders.

1.3.3.5 Scheduling.

END OF SECTION

SECTION 01 32 19

SUBMITTALS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED:

1.1.1 Procedures

1.2 RELATED REQUIREMENTS:

1.2.1 Section 01 30 00 – Administrative Provisions,
Section 00 62 76 – Application for Payment.

1.3 PROCEDURES:

1.3.1 Deliver submittals to the Engineer at:

Mark P. Cencer P.E., and David Pauling, P.E.
KS Associates, Inc.
260 Burns Road, Suite 100,
Elyria, OH 44035
Phone: 440-365-4730 ext. 395
Fax: 440-365-4790
Email: cencerm@ksassociates.com and paulingd@ksassociates.com

1.3.2 Transmit each item under Engineer-accepted form. Identify the Project, Contractor, subcontractor, major supplier, referenced Drawing number, detail number and Specification Section number, as appropriate. Identify deviations from Contract Documents. Provide space for Contractor and Engineer review stamps.

1.3.3 After Engineer review of submittal, revise and resubmit as required, identifying changes made since previous submittal.

1.3.4 Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

END OF SECTION

SECTION 01 32 33 – PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 SCOPE

- A. This Section includes preconstruction and construction progress digital photographs of major components of the work before they are covered, and other views as determined by the OWNER.
- B. The photographer shall be a professional, commercial photographer actively engaged in photographing similar projects for municipal agencies.
- C. Related Work specified elsewhere:
 - 1. N/A

1.02 SUBMITTALS

- A. The CONTRACTOR shall submit information for proposed Photographer for OWNER's approval, including qualifications and sample photographs which will be kept by the OWNER.
- B. For the (preconstruction) photos and each month submit the photographs taken for that month to the OWNER by e-mail. Electronic photograph files shall be in JPEG (.jpg) format. If the number of their photos and their file size render them too large to be e-mailed as attachments, an e-mail specifying an FTP site or other download link is acceptable.
- C. At the completion of the project submit the complete set of photographs over the duration of the project to the OWNER. An e-mail specifying an FTP site or other download link is acceptable.
 - 1. As an alternative, the CONTRACTOR may submit, if allowed by the OWNER, three (3) sets of the photography on a USB 3.0 Flash Drives of sufficient size to contain the complete electronic submittal with minimum read speeds of 245 MB/s and minimum write rates of 190 MB/s. If total data exceeds the capacity of a single 128GB Flash Drive, CONTRACTOR is to submit as multiple Flash Drives as necessary.
- D. All photographs will become the property of the OWNER.

PART 2 – PRODUCTS

2.01 PHOTOGRAPHS

- A. General Description: Sharp, clearly showing details and excluding non-related objects. Good focus with maximum depth of field and no distortion. Factually show the subject by including a scale in the view to define size, such as a yardstick. OWNER employees shall not be in the view of any photographs.
- B. Resolution: Photographs shall be taken with a digital camera with a minimum of 10 megapixel, with a minimum resolution of 1920 x 1440.
- C. Each photograph shall be submitted in JPEG (.jpg), PNG (.png), or GIF (.gif) file format.
- D. Latitude and longitude shall be included with the metadata for each digital photograph.

2.02 ELECTRONIC FILES

- A. Each photograph shall be named as follows:
24072_Painesville_XXXX_0001.jpg
where:
XXXX = Viewpoint of Photo
0001 = Photograph Number
- B. Photographs shall be named sequentially for the entire project beginning at 0001.
- C. Naming of Viewpoint of photograph shall be determined by the OWNER after the Viewpoint is chosen or when a new Viewpoint is chosen.
- D. For each photograph, submit electronic photo files by e-mail to the OWNER as noted in above Part 1.02, submittals. E-mails shall include the following information:
1. Project Name
 2. Project Acronym
 3. Project Number
 4. Date through Date (for pictures included on the compact disc)
 5. Photo # through Photo # (for pictures included on the compact disc)
 6. Prime CONTRACTOR
 7. Photographer

PART 3 – EXECUTION

3.01 NUMBER OF PHOTOGRAPHS AND LOCATION

- A. Preconstruction Photos: At least 12 preconstruction photographs of the site from viewpoints designated by the OWNER.
- B. Monthly Progress Photos: A minimum of 12 photographs shall be taken each month per outfall for the duration of the project from viewpoints designated by the OWNER. Photographs shall be taken to document the construction progress for the project duration. Views shall be such that an above-grade landmark can be used to roughly identify the location of the work and underground utilities if applicable.
- C. The OWNER reserves the right to adjust the number of views taken each month and the actual day the pictures are taken, in order to take advantage of construction procedures and weather.
- D. The general views taken will be approved by the OWNER.
- E. The OWNER reserves the right to require photographs be taken at any time other than at the regularly scheduled visits; however, if this occurs the regularly scheduled visit will be cancelled.

END OF SECTION

SECTION 01 52 00

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED:

- 1.1.1 Sanitary Facilities
- 1.1.2 Electric Services
- 1.1.3 Water Service
- 1.1.4 Barriers
- 1.1.5 Security
- 1.1.6 Cleaning During Construction
- 1.1.7 Removals
- 1.1.8 Storage Areas
- 1.1.9 Construction Working Hours and Environmental Concerns.

1.2 RELATED REQUIREMENTS:

- 1.2.1 Section 01 30 00 – Administrative Provisions

1.3 SANITARY FACILITIES:

- 1.3.1 Contractor shall be responsible for providing sanitary facilities for his workers.

1.4 ELECTRIC SERVICE:

- 1.4.1 Electric service is not available at the existing site.

1.5 WATER SERVICE:

- 1.5.1 Water service is not available at the site.

1.6 BARRIERS:

- 1.6.1 Provide temporary construction barriers as required to prevent unauthorized vehicle or pedestrian entry to the construction areas and to protect existing facilities and adjacent properties from damage from construction operations.

1.7 SECURITY:

- 1.7.1. Provide security program and facilities to protect work and existing facilities from unauthorized entry, vandalism, and theft. Coordinate security with the Owner's security program. Securing the construction area, materials and equipment shall be the responsibility of the contractor.

1.8 CLEANING DURING CONSTRUCTION:

- 1.8.1 Control accumulation of waste materials and rubbish; periodically dispose of off-site at a facility accepting the materials.

1.9 REMOVAL:

- 1.9.1 Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- 1.9.2 Clean and repair damage caused by installation or use of temporary facilities. Restore existing facilities used during construction to contract requirements, or to original condition. Contractor shall regrade, topsoil, and reseed all areas disturbed by the construction operations to the original condition or better prior to start of construction.

1.10 STORAGE AREAS:

- 1.10.1 The Contractor may use the area south of the existing bulkhead at the project site for storage of materials and equipment for construction. Coordinate use of this area with Owner.

1.11 CONSTRUCTION WORKING HOURS AND ENVIRONMENTAL CONCERNS:

- 1.11.1 Construction working hours shall be between 8:00 am and 5:00 pm, Monday through Friday. Unless requested otherwise and approved with the Owner/City.

END OF SECTION

SECTION 01 60 00

SPECIAL CONTRACT REQUIREMENTS

PART 1 – GENERAL

1.1 REQUIREMENTS INCLUDED:

- 1.1.1 Physical Data
- 1.1.2 Layout of Work
- 1.1.3 Tests and Inspections
- 1.1.4 Contractor's Liability Insurance
- 1.1.5 Owner Indemnification

1.2 PHYSICAL DATA:

- 1.2.1 Data and information furnished or referred to below is for the Contractor's information. The Engineer shall not be responsible for any interpretation of or conclusion drawn from the data or information by the Contractor.
 - 1.2.1.1 The physical conditions indicated on the drawings and in the specifications are the results of site investigations by surveys.

1.3 LAYOUT OF WORK:

- 1.3.1 The Contractor shall lay out the work by establishing all lines and grades at the site necessary to control the work and shall be responsible for all measurements that may be required for the execution of the work to the location and limit marks prescribed in the specifications or on the Contract Drawings.
- 1.3.2 The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by him until authorized to remove them. If any of the control points are destroyed by or through the negligence of the Contractor prior to their authorized removal, they shall be replaced by the Contractor. The Engineer may require that work be suspended at any time when horizontal and vertical control points established at the site by the Contractor are reasonably adequate to permit checking the work. Such suspension will be withdrawn upon proper placement of the control points.

1.4 TESTS AND INSPECTIONS:

- 1.4.1 The testing organization shall be an independent laboratory acceptable to the Engineer. The laboratory shall perform testing and other technical services as directed by, and with the approval of the Engineer.

- 1.4.2 Copies of all laboratory test and inspection reports shall be issued promptly by the contractor and forwarded directly to the Owner, Engineer and to other such persons or authorities as may be specified by the Engineer.
- 1.4.3 The Contractor shall notify the independent laboratory and the Engineer in sufficient time prior to the required time of inspection for them to make all inspections and tests. He shall also furnish such casual labor and all facilities which are necessary to obtain and handle samples at the project and to facilitate the specified inspections and tests. This shall include equipment for the Engineer to make his final inspection after all work is complete.

1.5 CONTRACTOR'S LIABILITY INSURANCE:

- 1.5.1 Copies of certificates of all the required insurances shall be submitted to the Owner prior to the commencement of work. The completed operations insurance to be maintained by the Contractor shall be maintained for a period of one year after final payment.
- 1.5.2 The limits of liability for the insurance shall provide coverage for not less than the following amounts or greater where required by law:
- 1.5.3 Comprehensive General Liability and Comprehensive Automobile Liability:
- 1.5.3.1 Bodily Injury Liability Insurance, in an amount not less than one million dollars (\$1,000,000.00) for injuries, including wrongful death to any one person, subject to the same limit for each person in an amount not less than one million dollars (\$1,000,000.00) on account of one accident.
- 1.5.3.2 Property Damage Insurance in an amount not less than one million dollars (\$1,000,000.00) for damage on account of any one accident and in an amount not less than two million dollars (\$2,000,000.00) for damages on account of all accidents.

1.5 OWNER INDEMNIFICATION:

- 1.6.1 To the fullest extent permitted by law, the Contractor agrees to indemnify, hold harmless, save and defend the Owner, Engineer, and their agents and employees, against all claims, liens, liabilities, losses, damages, or injuries, including, but not limited to, court costs, investigative costs, expenses, and attorneys' fees, whether or not caused by the actual or claimed active or passive negligence, of the Owner, Engineer, or the agents, employees, or representatives of any of them either as the sole or a contributing cause, for claims, liens, liabilities, losses, damages, or injuries to tangible or intangible property, wherever situated, including loss of use thereof, owned by the Owner, Engineer, or any other person regardless of whether that person is involved in the work under the contract or subcontracts, or to bodily or personal injuries, sickness, disease, or death resulting at any time therefrom, sustained by any person or persons, including, but not limited to, any employee or representative of any subcontractor, which claims, liens, liabilities, losses, damages or injuries arise out of or in connection with or result from, directly or indirectly, building operations from which arise claims by person or persons on the building premises in connection with the contract or subcontract, or the execution of the contract or subcontracts by the Contractor or any subcontractors or any one employed directly or indirectly by any one of them or anyone for whose acts any of them may be liable.

- 1.5.2 The provisions requiring the furnishing of personal injury liability or property damage insurance, the limitations imposed under workers' compensation acts, shall not be construed to limit, affect, or impair the generality of the foregoing.
- 1.5.3 Should any part of this indemnification clause be held invalid; the remainder shall be in full force and effect.

END OF SECTION

SECTION 01 71 13

MOBILIZATION

PART 1 – GENERAL

1.1 WORK INCLUDED

- 1.1.1 Work Included: This work shall consist of the performance of construction preparatory operations, including but not limited to the movement of personnel, equipment, materials to the project site. The contractor shall establish and maintain the necessary facilities to begin and sustain work on the Contract. In addition, the following items are to be included in the cost of mobilization:
- 1.1.1.1 Deliver necessary equipment as needed to complete the project. Coordinate with the City for access roads and routes to the site, any roads damaged shall be repaired at the contractor's expense.
- 1.1.1.2 Prepare various plans and other items as necessary to facilitate work as outlined in the contract documents.
- 1.1.1.3 Recurring costs for record documentation for the duration of the project.
- 1.1.1.4 Other work items necessary to begin construction, as shown in the plans.
- 1.1.1.5 Executing temporary easements for site access.
- 1.1.1.6 Restroom facilities for construction team.
- 1.1.1.7 Demobilization efforts at completion of the Project.

1.2 LIMITATION

- 1.2.1 The owner will limit the sum of the partial payments to the amounts shown in the table below under "Maximum Total of Partial Payments". The owner will pay the balance of the lump sum amount bid, as specified in 1.4.1.3.

Total Contract Amount		Maximum Total of Partial Payments (\$)
More than (\$)	Up to, inclusive (\$)	
0	50,000	0
50,000	100,000	2,000
100,000	200,000	4,000
200,000	500,000	10,000
500,000	1,000,000	20,000
1,000,000	2,000,000	40,000

2,000,000	5,000,000	100,000
------------------	------------------	----------------

If the lump sum amount bid for Mobilization exceeds the total shown the table above for partial payments, the owner will pay the excess upon completion of the project.

1.3 METHOD OF MEASUREMENT

1.3.1 The owner will measure mobilization as lump sum, acceptably performed.

1.4 PAYMENT

1.4.1 The owner will make partial payments according to the following schedule:

1.4.1.1 The owner will release 50 percent of the lump sum amount bid for Mobilization or 50 percent of the amount shown in 1.2, whichever is less, to the Contractor with the first estimate payable, but not sooner than 15 days after the start of work at the project site.

1.4.1.2 The owner will release an additional 40 percent of the lump sum amount bid for Mobilization or 40 percent of the amount shown in 1.2, whichever is less, with the first regular estimate after 10 percent of the original total contract amount, including payments for delivered materials but excluding Mobilization, is earned.

1.4.1.3 Upon completion of all work on the project, including final cleanup, the owner will release payment of the remaining 10 percent of the lump sum amount bid for Mobilization and any amount of the lump sum price bid for Mobilization, in excess of the total amount shown in 1.2 for partial payment. Final cleanup includes but is not limited to the removal of construction layout stakes and sediment and erosion control items.

1.4.1.4. Partial payments are subject to retainage per the contract.

END OF SECTION

SECTION 02 06 00

DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES:

- 1.1.1. The work shall consist of furnishing all labor, equipment and material necessary to demolish all items listed on the contract documents. Items to include the existing timber fence. The timber fence is to be stockpiled and reinstalled after construction. Note that dust control is considered incidental to all removals.
- 1.1.2. The contractor shall be responsible for all damages caused by demolition of items on the project during construction and shall be responsible for restoring any damaged areas to their original condition (before construction started).

1.2 REFERENCES:

- 1.2.1 This section is unused.

1.3 MEASUREMENT:

1.3.1 Existing Structures

The existing structures to be removed and stockpiled shall be measured by lump sum.

1.4 PAYMENT:

1.4.1 Demolition

No separate payment will be made for removal of miscellaneous metals. Removal of miscellaneous metals shall be included with the contract lump sum price for "Demolition", which price shall include all costs of removing and disposal of the items as shown on the drawings or as directed by the Engineer.

1.4.2 Concrete

No separate payment will be made for removal of concrete. Concrete removal shall be included at the contract lump sum price for "Demolition", which shall include all costs for plant, labor and materials required to complete the work as herein specified. The price for removal shall include all costs for saw cutting; control of removed concrete, rebar and debris; disposal of the material; and protection of existing features. Dust control is considered incidental to all removals.

1.4.3 Armor Stone, Talus and Rubble

No separate payment will be made for removal of armor stone, talus or rubble. All materials shall be removed at the contract lump sum price for "Demolition", which will constitute full compensation for all costs of furnishing labor, plant and equipment required to complete the work specified herein and shown on the drawings.

1.4.4 Existing Structures, Abandoned Structures or Associated Appurtenant Elements

Removal of all manhole drop structures, abandoned drop structures, associated brick conduits, abandoned brick conduits, existing manholes or remnants thereof shall be paid at the contract lump

SECTION 02 06 00

sum price for "Demolition", which will constitute full compensation for all costs of furnishing labor, plant and equipment required to complete the work specified herein and shown on the drawings.

PART 2 EXECUTION

2.1 GENERAL

Removal or demolition shall be done with care to avoid damage to adjacent structure and concrete not scheduled to be removed under this contract. All reinforcement and other embedded items exposed or encountered during the removal operations shall, unless otherwise directed, be cut off flush at the breakout location. Any miscellaneous items not indicated to be removed, which are encountered in the performance of the work under this contract shall not be removed without authorization of the Engineer.

2.2 REMOVAL OF ITEMS

Miscellaneous items on the site shall be removed to the extent shown on the drawings or required to perform the work under this contract.

2.2.1 Disposal

All removed items shall become the property of the Contractor and shall be removed from the site by the Contractor at his expense.

3.3 REMOVAL OF STRUCTURES

Structures scheduled for demolition shall be removed to the indicated depths by using tools specified in paragraph "Power Tools." All edges of a structure adjacent to existing remaining structure except where the edge of a repair area occurs at a joint, shall be saw cut a minimum depth of two (2) inches, unless otherwise noted. Broken concrete and debris shall not be permitted to enter adjacent watercourse. Blasting will not be permitted for any removals.

3.3.1 Power Tools

For removals, the Contractor may use drilling or coring equipment, handheld air, hydraulic-driven chipping hammers. Hand methods will be permitted. Heavy-duty pavement impact breakers or drop balls will not be permitted unless approved by the Engineer. Boom or vehicle-mounted rotary equipment such as rock saws, mining machines or rock drills will be permitted subject to approval by the Engineer. Adequate safety measures shall be provided to protect workers, equipment, and structure in the vicinity of the work. All equipment shall be subject to the review and approval of the Engineer.

3.3.3 Control of Removed Concrete and Debris

No construction debris will be allowed to drop to the bottom of the adjacent watercourse. Concrete and debris from removal operations for top of pier shall be collected and retained next to pier side walls above water level. The Contractor's written method of debris control and removal must meet the approval of the Engineer.

3.3.4 Disposal of Concrete, Debris and Wastewater

Broken concrete may be reused in the new work as indicated. Unless noted otherwise, broken concrete and other debris shall be removed from the site and disposed in a suitable area to be obtained and arranged for by the Contractor. The Contractor shall obtain written consent of the owner of the property on which disposal will be made and shall furnish evidence thereof to the Owner. The method used for disposing of wastewater employed in cutting, washing, and rinsing of

concrete surfaces shall be such that the wastewater does not stain, discolor, or affect exposed surfaces of the structure, or damage the environment of the project area. Method of disposal shall be subject to approval.

End of Section

SECTION 02 21 00

CONSTRUCTION SURVEYING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The work under this Section includes providing all labor, materials, tools and equipment necessary to perform all surveying and staking necessary for the completion of the Project in conformance with the Drawings and Specifications and standard engineering and surveying practices, including all calculations required to accomplish the WORK.
- B. The work shall include the staking, referencing and all other actions as may be required to preserve and restore land monuments and property corners which are situated within the Project area, and to establish monuments as shown on the Drawings.

1.2 RELATED WORK

- A. Section 01 60 00 – Special Contract Requirements
- B. Section 31 23 00 – Excavation, Grading, and Slope Preparation
- C. Section 31 41 16 – Steel Sheet Piling
- D. Section 35 31 19 – Armor Stone Revetment

1.3 CONSTRUCTION SURVEY AND STAKING TOLERANCES

- A. The Contractor shall provide construction surveying and staking to the tolerances specified below:

Type	Horizontal Tolerance (feet)	Vertical Tolerance (feet)
Stakes	0.01	N/A
All other surveying above water	0.05	0.10
All other surveying below water	0.20	0.20

1.4 SURVEY DATA FORMAT

- A. All survey data shall be provided in the coordinate system, datums, and units listed on the Contract Drawings. Nevertheless, the Contractor shall note the coordinate system, datums, and units with each submittal of survey data to the Engineer.
- B. All survey data shall be provided in AutoCAD *.DWG format, versions 2005-2018 are acceptable. Where submittals require the submission of coordinate points (i.e.:

topographic survey points, pile locations, etc.), points shall be also be provided in plain-text or Excel format as a comma separated value (*.CSV) file.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work.

PART 3 - EXECUTION

3.1 GENERAL

- A. All surveying shall be done by, or under the direction of, a registered Professional Surveyor licensed in the State of Michigan.
- B. The Owner or Engineer will supply information relative to the approximate locations of monuments and corners, but final responsibility for locations, referencing, and restoration shall rest with the Contractor.
- C. In the event the Contractor does not replace the survey monuments and property corners disturbed by the Contractor's operations, the Owner may, after first notifying the Contractor, replace the monuments in question. The cost of such replacements shall be deducted from payments to the Contractor.
- D. The Contractor shall provide the Engineer with a copy of all surveyors' notes, if requested by the Engineer, prior to each Pay Request that includes Construction Surveying as a payment item.
- E. The Contractor shall provide the Owner with a copy of all surveyors' notes, prior to the request for final payment, and include the information on the record drawings.
- F. The Contractor shall obtain all information necessary for as-built plan production, from actual measurements and observations made by its own personnel, including subcontractors, and submit this information to the Engineer.
- G. The Contractor shall furnish, at his own expense, all such stakes, spikes, steel pins, templates, platforms, equipment, tools and material and all labor as may be required in laying out any part of the work. It shall be the responsibility of the Contractor to maintain and preserve all stakes and other markers established by him until authorized to remove them. If any of the control points are destroyed by or through the negligence of the Contractor prior to their authorized removal, they shall be replaced by the Contractor. The Engineer may require that work be suspended if at any time when horizontal and vertical control points established at the site by the Contractor are not reasonably adequate to permit checking the work. Such suspension will be withdrawn upon proper placement of the control points.
- H. The Contractor shall perform all staking necessary to delineate clearing and/or grubbing limits; all cross sections necessary for determination of excavation and embankment quantities, including intermediate and/or remeasure cross sections as may be required; all slope staking; all staking of piles, sheet piles, and walkways, including the necessary checking to establish the proper location and grade to best fit the conditions on site; the

setting of such finishing stakes as may be required; the staking of right-of-way; the staking, referencing and other actions as may be required to preserve or restore land monuments and property corners; and all other staking necessary to complete the project.

- I. Field notes shall be kept in standard bound notebooks in a clear, orderly and neat manner, consistent with standard engineering and surveying practices. The Contractor's field books shall be available for inspection by the Engineer at any time.
- J. All field survey notes, including those which become source documentation from which quantities for payment are computed, shall be recorded by a notekeeper furnished by the Contractor. The notekeeper shall be thoroughly familiar with generally accepted standards of good survey notekeeping practice.
- K. A minimum of ten days prior to installation, unless otherwise approved by the Engineer, the Contractor shall stake the location of the new electric conduits, fire suppression mains, and fire suppression standpipe conduits. Each stake shall be a surveyor's lathe marked as to the type of service and placed at the right-of-way line at the locations shown on the Drawings.

END OF SECTION

SECTION 02 93 00

SITE RESTORATION

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- 1.1.1 The work shall consist of furnishing all labor, equipment and material necessary to finish grade, topsoil, seed, mulch, establish and maintain vegetation for the areas as specified herein.
- 1.1.2 All disturbed areas shall be top soiled and vegetated as described herein.
- 1.1.3 The contractor shall be responsible for all damages caused by construction of the project and shall be responsible for restoring any damaged areas to their original condition (before construction started).
- 1.1.4 Installation of landscaping consisting of woody materials, i.e., bushes, shrubs, trees, plantings, etc. are not a part or required in this contract.

1.2 RELATED SECTIONS:

- 1.2.1 Section 31 23 00 Excavation and Backfill

1.3 SUBMITTALS:

- 1.3.1 The Contractor shall submit a complete materials list of items proposed for the work and a description of how the work will be completed.
- 1.3.2 The Contractor shall submit seed certifications for all bags used in the project.

1.4 DELIVERY, STORAGE AND HANDLING:

- 1.4.1 Deliver grass and wildflower seed (if required) in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging, and location of packaging. Damaged packages are not acceptable.

1.5 MAINTENANCE:

- 1.5.1 Maintain vegetated surfaces and supply additional topsoil where necessary, including areas affected by erosion.
- 1.5.2 Replant damaged grass areas showing root growth failure, deterioration, bare or thin spots, and eroded areas.
- 1.5.3 Water seeded areas as needed to promote growth as specified herein.

PART 2 – PRODUCTS

2.1 SEED MIXTURE:

- 2.1.1 Use a mixture in accordance with ODOT Item 659.09 for Native Wildflower and Grass Mixtures.

2.2 MULCH:

- 2.2.1 Mulching material: Oat or wheat straw, reasonably free from weeds, foreign matter detrimental to plant life, and in a dry condition.
- 2.2.2 Establishment blanket: Uniform open weave jute matting; excelsior matting; erosion control mulching fabric consisting of knitted construction of yard interwoven with strips of biodegradable paper; or organic fiber protective fiber mat consisting of half-inch layer of chopped straw, knitted into mat with thin netting of biodegradable polypropylene.

2.4 TOPSOIL:

- 2.2.1 Minimum of 3" thickness, unless noted otherwise (UNO).

PART 3 – EXECUTION

3.1 EXAMINATION:

- 3.1.1 The Contractor shall not begin work in this section until the final grading has been approved by the Engineer.

3.2 PREPARATION:

- 3.1.1 The Contractor shall test the soil for the appropriate pH. The test results shall be submitted to the Engineer.
- 3.1.2 If needed, the Contractor shall apply agricultural liming material (amendments) as specified in Bulletin 472 "Agronomy Guide", published by the Cooperative Extension Service, The Ohio State University.

3.3 APPLICATION GRASS SEED:

- 3.3.1 The seeding shall be completed within three days after completion of final grading or as soon thereafter as conditions are favorable. Seeding shall occur between March 1 and October 30. Between October 30 and March 1, apply temporary seed according to ODOT Item 832.
- 3.3.2 The seedbed shall be prepared by pulverizing and breaking up the soil to a minimum depth of two inches with a disk harrow, drag harrow, spike tooth harrow or similar tool. All rocks over two inches in diameter, clods and undesirable material that would interfere with seeding operation shall be removed.
- 3.3.3 The grass seed shall be drilled or broadcast uniformly over the seedbed at a rate of 220 pounds per acre (5 pounds per 1,000 square feet) using methods and equipment acceptable to the Engineer. For wildflower seeding, plant at the rate specified by the manufacturer. The seeded area shall be passed over with a cultipacker or similar tool to help cover more seed and improve seeding establishment. Application of grass seed and fertilizer at the same time, in the same machine is not permitted.

- 3.3.4 Seed sowing is not permitted immediately following rain, when the ground is too dry, or during windy periods.
- 3.3.5 The approved mulch shall be applied over the seeded area at a rate of 2 tons per acre (one bale per 1,000 square feet) for straw. Hydro mulching will not be permitted.
- 3.3.6 The Contractor shall seed and mulch all disturbed areas.
- 3.3.7 Seeded areas shall be watered as necessary to promote good growth during the germination and establishment period. During the establishment period the Contractor shall water a minimum of one inch over the seeded area two times per week. In dry weather, more frequent watering will be required to provide a stand of grass.

3.4 ADJUSTING:

- 3.4.1 Any vegetated areas which are found to not have an adequate growth of cover during the first year shall be re-seeded as soon as weather conditions permit, at no additional cost to the Owner.

3.5 INSTALLATION:

- 3.5.1 The Contractor shall secure the work area and protect the vegetated areas until vegetation is accepted.

PART 4 – PAYMENT

4.1 PAYMENT:

- 4.1.1 Payment for all work performed under this Section will be by lump sum bid price for Site Restoration.
- 4.1.2 Upon acceptable seeding, fertilizing and mulching phases of work as approved by the Engineer, fifty percent payment shall be made to the Contractor based on the division of contract price submitted.
- 4.1.3 Watering - Thoroughly water all permanent seeded areas (Classes 1 to 6) after the seed has germinated. Apply a total rate of 300 gallons per 1000 square feet in at least 2 applications spread over 7 days. Apply the water using a hydro-seeder or a water tank under pressure with a nozzle that produces a spray that will not dislodge the mulch material.

Perform a secondary water application between 7 and 10 days after the primary applications. If 1/2-inch (13 mm) or greater of rainfall has occurred within the first 7-day period, the Contractor may delay or omit the secondary application, depending on weather conditions.
- 4.1.4 Lime application per testing and will be paid on a per acre measurement.
- 4.1.4 Upon established grass as approved by the Engineer, the remaining fifty percent payment based on the division of contract price shall be made to the Contractor.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 – GENERAL

1.1 WORK INCLUDED:

1.1.1 Reinforcing steel bars (or WWF) for cast-in-place concrete foundations.

1.2 RELATED WORK:

1.2.1 Section 03 30 00 – Cast-In-Place Concrete.

1.3 REFERENCES:

1.3.1 ACI 301 – Structural Concrete for Buildings.

1.3.2 ACI 315 – Details and Detailing of Concrete Reinforcement.

1.3.3 ACI 318/318R Building Code Requirements for Structural Concrete and Commentary latest edition.

1.3.4 ASTM A108 – Steel Bars, Carbon, Cold-Finished, Standard Quality.

1.3.5 ASTM A185 – Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement.

1.3.6 ASTM A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

1.3.7 CRSI – Manual of Standard Practice.

1.3.8 CRSI 63 – Recommended Practice for Placing Reinforcing Bars.

1.3.9 AWS D1.4 (1998) Structural Welding Code - Reinforcing Steel

1.4 QUALITY ASSURANCE:

1.4.1 Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice, and Document 63.

1.4.2 Conform to ACI 301.

PART 2 – PRODUCTS:

2.1 MATERIALS:

2.1.1 Reinforcing Steel: ASTM A615, 60 KSI yield grade, billet-steel, deformed bars. All reinforcing steel and welded wire fabric shall be epoxy coated.

2.2 ACCESSORY MATERIAL:

2.2.1 Tie Wire: Minimum 16 gage annealed type.

- 2.2.2 Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete. All supports shall be epoxy coated.

2.3 FABRICATION:

- 2.3.1 Fabricate in accordance with ACI 315.
- 2.3.2 Locate reinforcing splices not indicated on drawings at points of minimum stress. Minimum lap length shall be 18 inches.

PART 3 – EXECUTION

3.1 INSTALLATION:

- 3.1.1 Before placing concrete, clean reinforcement of foreign particles or coatings.
- 3.1.2 Place, support, and secure reinforcement against displacement. Do not deviate from alignment or measurement.

PART 4 – PAYMENT

- 4.1 Payment for concrete reinforcement will be included within the payment for concrete fill based on the lump sum for bid. Concrete Reinforcement shall be placed as shown in the contract drawings. Material placed in excess of the quantities and locations specified will not be paid for except where authorized by the Engineer. Any concrete reinforcement wasted or used by the Contractor for other purposes and any concrete reinforcement not placed in accordance with the requirements of the specifications will not be measured or paid for.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 WORK INCLUDED:

- 1.1.1 Furnish labor, materials, equipment, and transportation for placement of cast-in-place concrete slabs.
- 1.1.2 Furnish for the approval of the Engineer for the following:
 - 1.1.2.1 Submit concrete mix design to the Engineer for review and approval.
 - 1.1.2.2 Manufacturer's Literature: Certificates of compliance from suppliers which demonstrates compliance with applicable specifications for the concrete admixtures and curing compound.
 - 1.1.2.3 Placement Procedure: The Contractor shall submit a complete outline of the procedure to be used for scaffolding for form installation and for the placement of concrete. Such data shall clearly describe the methods for transportation, handling, and depositing the concrete.
 - 1.1.2.4 Curing: The curing medium and methods to be used shall be submitted for the Engineer's review.

1.2 RELATED WORK:

- 1.2.1 Section 03 20 00 – Concrete Reinforcement.
- 1.2.2 Section 03 35 00 – Concrete Finishing.

1.3 REFERENCES:

- 1.3.1 American Society for Testing and Materials (ASTM), latest edition:
 - C31 Making and Curing Concrete Test Specimens in the Field
 - C33 Concrete Aggregates
 - C39 Compressive Strength of Cylindrical Concrete Specimens
 - C94 Ready-Mixed Concrete
 - C143 Slump of Portland Cement Concrete
 - C150 Portland Cement
 - C172 Sampling Freshly Mixed Concrete
 - C231 Air Content for Freshly Mixed Concrete by the Pressure Method
 - C260 Air-Entraining Admixtures for Concrete

C494 Chemical Admixtures for Concrete.

1.3.2 U.S. Army Corps of Engineers Handbook for Cement and Concrete (CRD):

CRD-C 300 Membrane-Forming Compounds for Curing Concrete

1.3.3 American Concrete Institute (ACI), latest edition:

ACI305R Hot Weather Concreting

ACI306R Cold Weather Concreting.

1.3.4 State of Ohio Department of Transportation (ODOT) Construction and Material Specifications.

1.4 COORDINATION:

1.4.1 Unless other satisfactory agreements are specifically entered into by contractors concerned, all miscellaneous iron and steel, sleeves, anchors, etc., required by work of other contractors, will be furnished and installed by such other contractors with the cooperation of this Contractor.

PART 2 – PRODUCTS

2.1 Portland Cement: ASTM C150, Type I or IA. Use one brand name only.

2.2 Coarse Aggregate: Hard, durable, uncoated crushed stone or gravel meeting requirements of ODOT 703.02

2.3 Fine Aggregate: Clean, hard, durable, uncoated grains, natural sand or manufactured sand, free from silt, loam and clay. Fine aggregate shall comply with ODOT 703.02.

2.4 Air-Entraining Admixture: ASTM C260.

2.5 Water-Reducing Admixture: ASTM C494, Type A, admixtures containing chloride are prohibited. With the engineer's approval, Types A through G may be used; if Type F and Type G are used an additional cylinder shall be cast and tested at 28 days.

2.6 Water: Fresh, clean and potable, and free of injurious amounts of oil, acid, alkali, salts, suspended solids, or organic matter. Lake water from the project site is not acceptable.

2.7 Calcium chloride or admixtures containing chloride are prohibited.

2.8 Curing Materials:

2.8.1 Membrane-forming curing compound: CRD-C 300, non-pigmented. Non-pigmented compound shall contain a fugitive dye.

2.9 Concrete Slabs:

2.9.1 Concrete Slabs: Provide a minimum of 4,000 psi after 28 days.

2.9.2

TOTAL AIR CONTENT FOR VARIOUS SIZES OF COARSE AGGREGATE FOR NORMAL WEIGHT CONCRETE		
Nominal maximum size coarse aggregate, in.	Size Number	Total air content of percent by volume
3/8	8	7 – 10
1/2	4	6 – 9
3/4	67	5 – 8
1	57	4.5 – 6.5
1-1/2	467	4 – 6
2	357	3.5 – 5.5
3	---	2.5 – 4.5
Maximum slump for normal weight concrete: 4"		

2.9.3 If high-range, water-reducing admixtures (superplasticizers) are used, the following shall apply:

(1) Interior or below ground concrete not subject to freezing and thawing – the concrete shall be delivered to the job site at a water slump of 3" to 4". Superplasticizer shall be added to achieve a maximum slump if 8".

(2) Concrete subject to freezing and thawing – the concrete shall be delivered to the job site at a water slump of 2" to 3". Superplasticizer shall be added to achieve a maximum slump of 8". The air contents specified in 2.9.2 shall apply and shall be measured at the point of placement.

2.9.4 Admixtures:

2.9.4.1 Use water-reducing admixture or water-reducing, retarding admixture in concrete as required for placement and workability, in strict compliance with manufacturer's directions.

2.9.4.2 Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content noted in Table 2.9.2.

2.10 Concrete Mixing:

2.10.1 Ready-mix concrete shall comply with requirements of ASTM C94, and as specified herein.

2.10.2 Concrete transported in a truck mixer shall be discharged at the job within 1-1/2 hours after cement and aggregates are combined with water.

2.10.3 During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.

2.10.3.1 When air temperature is between 85° F (30° C) and 90° F (32° C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90° F (32° C), reduce mixing and delivery time to 60 minutes.

- 2.10.4 No water will be permitted to be added to the mix after initial mixing.
- 2.10.5 Whenever the placing of concrete is suspended for a period of 60 minutes or longer, the material shall be considered as "hardened concrete".

PART 3 – EXECUTION

3.1 GENERAL:

- 3.1.1 Existing concrete surfaces shall be cleaned of all dirt, dust, and debris prior to placing new concrete.
- 3.1.2 Existing concrete surfaces shall be damp, but not wet, prior to placing new concrete.

3.2 JOINTS:

- 3.2.1 Contraction Joints: Provide 1-3/4" deep x 1/4" wide sawcut control joints as shown on the contract drawings. Use a backer rod with self-leveling polyurethane sealant (single component) with an accelerated curing capacity. Meeting Federal Specification TT-S-00230C, Type 1, Class A and meets ASTM C-920, Type S, Grade P, Class 25. Install the sealant 3/8"-1/2" into the sawcut joint, (Sikaflex-1cSL or equal).
- 3.2.2 Expansion Joints: Place self-leveling polyurethane sealant (single component) with an accelerated curing capacity in the prepared joint. Material to meet Federal Specification TT-S-00230C, Type 1, Class A and meets ASTM C-920, Type S, Grade P, Class 25. Install the sealant 3/8"-1/2" into the sawcut joint, (Sikaflex-1cSL or equal).

3.3 CONCRETE PLACEMENT

- 3.3.1 General: Equipment used for transporting and placing concrete including pumps and dump buckets shall be subject to approval by the Engineer. Contractor shall provide minimum 48-hour notification to the Engineer before placing concrete.
- 3.3.2 Preplacement inspection: Before placing concrete, the Engineer shall inspect the complete formwork installation, reinforcing steel, joint materials and items to be embedded or cast-in.
- 3.3.3 Placing concrete in forms: Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams, cold joints, or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
- 3.3.4 Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping.
 - 3.3.4.1 Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete

embedment of reinforcement and other embedded items without causing segregation of mix.

- 3.3.5 Placing concrete slabs: Deposit and consolidate concrete slabs in a continuous operation.
- 3.3.6 Bring slab surfaces to correct elevation, level with straightedge and strike off. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. Slab or wearing course surface variations shall not exceed 1/8" in a 10' distance.
- 3.3.7 Maintain reinforcing in proper position during concrete placement operations.

3.4 Cold Weather Requirements (incidental to work no separate pay item):

- 3.4.1 When cold weather conditions exist that would impair quality and strength of concrete, place concrete in compliance with ACI 306R and as herein specified.
- 3.4.2 Provide adequate equipment for heating concrete materials and protecting concrete during freezing weather. Do not use frozen materials or materials containing ice.
- 3.4.3 Concrete materials, reinforcement, forms, and fillers shall be free from frost. Whenever the temperature of surrounding air is below 40° F, concrete placed in forms shall have a temperature between 70° F and 80° F, and adequate means shall be provided for maintaining a temperature of not less than 70° F for 3 days, or 50° F for 5 days, or for as much more time as is necessary to insure proper curing of concrete. Housing or other protection shall remain in place and intact at least 24 hours after artificial heating is discontinued. No dependence shall be placed on salt or other chemicals for the prevention of freezing.

3.5 Hot Weather Requirements (incidental to work no separate pay item):

- 3.5.1 When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI305R and as herein specified.
- 3.5.2 Cool ingredients before mixing to maintain concrete temperature at time of placement below 90° F (32° C). Mixing water may be chilled or chopped ice may be used to control temperature provided water equivalent of ice calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
- 3.5.3 Take adequate precautions to prevent accelerated setting, strength reduction, and plastic cracking due to high concrete temperatures and exposure to wind. Provision for windbreaks, shading, fog spraying, or wet covering with a light-colored material shall be made in advance of placement, and such protective measure shall be taken as quickly as finishing operations will allow.
- 3.5.4 Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

3.6 Use Water-Reducing Retarding Admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.7 Curing and Protection:

- 3.7.1 General: Concrete shall be cured by an approved method for 7 days. Concrete shall be protected from premature drying, extremes in temperatures, rapid temperatures change, mechanical injury and injury from rain and flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the site prior to start of work.
- 3.7.2 Moist curing: Concrete moist cured shall be maintained continuously (not periodically) wet for the entire curing period.
- 3.7.3 Membrane curing: Concrete may be cured with an approved curing compound in lieu of moist curing. Membrane curing will not be permitted on any surface containing protruding steel reinforcement.
- 3.7.3.1 The curing compound shall be applied to formed surfaces immediately after the forms are removed and prior to any patching or other surface treatment except the cleaning of loose sand, mortar, and debris from the surface. The surfaces shall be thoroughly moistened with water and the curing compound applied as soon as free water disappears. The curing compounds shall be applied to unformed surfaces in a 2-coat continuous operation by approved motorized power-spraying equipment at the manufacturer's heaviest recommended coverage. Surfaces which have been subjected to rainfall within 3 hours after curing compound has been applied shall be re-sprayed by the method and at the coverages herein specified. All concrete surfaces on which the curing compound has been applied shall be adequately protected for the duration of the entire curing period from any causes which will disrupt the continuity of the curing membrane.

3.8 Concrete Surface Repairs

- 3.8.1 General: The Contractor and the Engineer shall inspect all completed cast-in-place concrete structures immediately after removal of forms to determine defects and to establish the scope of repairs.
- 3.8.2 Patching defective areas: Repair and patch defective areas with cement mortar.
- 3.8.2.1 Cut out honeycomb, rock pockets, voids over ¼" in any dimension, and holes left by tie rods and bolts, down to solid concrete, but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with approved bonding agent. Place patching mortar after bonding compound has dried.
- 3.8.3 For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- 3.8.4 Repair of formed surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be

removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

- 3.8.5 Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
- 3.8.6 Repair of unformed surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and to very surface plan to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
- 3.8.7 Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, including crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
- 3.8.8 Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
- 3.8.9 Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to the Engineer.
- 3.8.10 Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least ¾" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Cement paste slurry may be used as a bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- 3.8.11 Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part of Portland cement to 2-1/2 parts fine aggregate passing no. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.
- 3.8.12 Perform structural repairs with prior approval of the Engineer for method and procedure, using specified epoxy adhesive and mortar.
- 3.8.13 Repair methods not specified above may be used, subject to approval of the Engineer.

3.9 Field Sampling:

- 3.9.1 Sampling: Collect samples of fresh concrete in accordance with ASTM C172 during each working day as required to perform all tests specified herein. Make test specimens in accordance with the ASTM C31.

3.10 Field Testing:

- 3.10.1 Consistency tests: Determine slump in accordance with ASTM C143. Take samples for slump determination from the concrete while it is being placed. Perform tests at the beginning of a concrete placement operation and at subsequent intervals to ensure that the specification requirements are met. In addition, perform tests each time test cylinders are made.
- 3.10.2 Compressive tests: Determine compressive strength in accordance with ASTM C39. Make four (4) test specimens for each set of tests. Test one specimen at 7 days, two at 28 days, and one hold cylinder. Frequency of compressive tests shall be not less than one for each shift's pour, plus additional sets for each 50 CY or portion thereof over and above the first 25 CY of each concrete class placed in any one day.
- 3.10.3 Air content: Test air-entrained concrete for air content at the same frequency as specified for slump tests. Determine percentage of air in accordance with ASTM C231 pressure method, on samples taken during placing of the concrete in the forms.
- 3.10.4 Concrete temperature: Test hourly when air temperature is 40° F and below, and when 80° F and above; and each time a set of compressive test specimens is made.
- 3.10.5 Contractor shall provide services of an approved testing laboratory to perform concrete field sampling and testing as required.
- 3.10.6 Test results will be reported in writing to the Engineer within 24 hours that tests are made.
- 3.10.7 Nondestructive testing: Impact hammer, sonoscope, or other non-destructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

3.11 Evaluation and Acceptance of Concrete:

- 3.11.1 Slump exceeding the specified maximum by more than 1", when occurring in two consecutive tests made on different portions of the same sample, will be cause for rejection of that truck load or batch load.
- 3.11.2 No concrete shall be placed that does not meet air requirements. If air content at the floated surfaces is more than 5% less than the companion test of the same sample taken at the delivery chute, the Contractor shall immediately take steps to correct the placement procedures.
- 3.11.3 No concrete shall be placed or accepted when the concrete temperature exceeds 90° F.
- 3.11.4 Strength level of concrete shall be considered satisfactory if 90% of the strength test results and the average of sets of three consecutive strength tests results equal or exceed the specified compressive strength, and no individual strength test result falls below the specified value by more than 500 psi.

- 3.11.5 When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate operations and provide corrective procedures for protection and curing in-place concrete.
- 3.11.6 The Contractor shall pay all costs associated with replacement or rejected or unaccepted concrete work.

PART 4 – PAYMENT

- 4.1 Payment for cast-in-place concrete will be based on the lump sum bid for the corresponding concrete work (Concrete Fill Between Modules & Shale Bluff and Reinforced Concrete Slab Above Concrete Module Wall).
- 4.2 Cast-in-place concrete shall be placed as shown in the contract drawings. Material placed in locations not specified will not be paid for except where authorized by the Engineer. Any cast-in-place concrete wasted or used by the Contractor for his convenience, other purposes, and cast in-place concrete not placed in accordance with the requirements of the specifications will not be measured or paid for. Concrete will be paid in lump sum.
- 4.4 No allowance shall be made in the price of the cast-in-place concrete for excavation beyond the limits required, as shown on the Contract Drawings. The cost of excavation for the purpose of site access shall be the responsibility of the Contractor. Removal of unsuitable soils and replacement of select fill shall be as directed and approved in writing by the Engineer and shall be paid as a part of the lump sum for Excavation.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 – GENERAL

1.1 WORK INCLUDED

- 1.1.1 Furnish all labor, materials, services, equipment, and apparatus necessary to complete all structural steel work shown on the Contract Drawings and specified herein.

1.2 APPLICABLE PUBLICATIONS

- 1.2.1 American Institute of Steel Construction (AISC) Publications:
- AISC 348 (2004) Specification for Structural Joints Using ASTM A325 or A490 Bolts
- Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, Adopted November 1, 1978
- Code of Standard Practice for Steel Buildings and Bridges, September 1, 1976
- Manual of Steel Construction, 9th Edition, Allowable Stress Design (ASD)
- 1.2.2 American Society for Testing and Materials (ASTM) Publications:
- A572/A572M Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
- ASTM A 36/A 36M (2008) Standard Specification for Carbon Structural Steel
- ASTM A 53/A 53M (2007) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
- ASTM A 325 (2009) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
- A563 Carbon and Alloy Steel Nuts
- A436 Hardened Steel Washers
- A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- A722 Uncoated High strength Steel Bar for Prestressing Concrete
- 1.2.3 American Welding Society (AWS) Publications:
- D1.1 Structural Welding Code – Steel

1.3 SUBMITTALS

- 1.3.1 Materials, the Contractor shall furnish the Engineer with three copies of all mill certificates, or a high-quality electronic copy for materials. The Contractor at the time of submittal of shop drawings, shall furnish a list designating the material to be used for each item. The Contractor shall furnish a shipping bill (Bill of Lading) or memorandum of each shipment of finished pieces or members to the project site, giving the designation mark and weight of each piece, the number of pieces, the total weight, and if shipped by rail in carload lots, the car initial and number.
- 1.3.2 Certificates
- 1.3.2.1 Miscellaneous Metal Materials Certificates for material tests and analysis.
- 1.3.2.2 Qualification of Welders and Welding Operators; A copy of current welder's certificates shall be submitted; position of the weld certificate shall be noted on the certificate.
- 1.3.3 Submit shop drawings of earth/embankment retention structures, cofferdams, trench boxes or benching of open cut trenches that the Contractor may use during the prosecution of the work.

PART 2 – PRODUCTS

2.1 STEEL

- 2.1.1 Materials shall conform to the respective specifications specified herein and shown on the drawings. Materials not otherwise specified herein on the drawings shall conform to the AISC "Manual of Steel Construction". the Contractor shall furnish the Engineer with three copies (or a high-quality electronic copy) of all mill certificates for materials.
- All materials shall be new and without splices.
- 2.1.2 Structural Steel: ASTM A572 Grade 50 with a minimum yield strength of 50,000 psi (as required on the Contract Drawings).
- 2.1.3 Miscellaneous steel plates and beams shall comply with ASTM A572 Grade 50. Bolts shall comply with ASTM A325, Nuts shall comply with ASTM A563 and Washers with ASTM A436.

PART 3 – EXECUTION

3.1 CLEANING

- 3.1.1 Wash surfaces which become contaminated with rust, dirt, oil, grease, or other contaminants with solvents until thoroughly clean. Ensure that steel to be embedded in concrete or mortar is free of dirt and grease.

3.2 ERECTION

- 3.2.1 Erect steel in accordance with the AISC "Manual of Steel Construction".
- 3.2.2 Make provision for erection loads, and for enough temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

3.2.3 Do not field cut or alter structural members without approval of the Engineer.

3.2.4 Tolerances: In accordance with the "Code of Standard Practice" of the AISC "Manual of Steel Construction".

3.3 WELDING

3.3.1 AWS D.1.1.

4.0 PAYMENT

4.1 Payment for structural steel will be based on the lump sum bid, for each individual steel bid item.

END OF SECTION

SECTION 31 05 22

GEOTEXTILE FILTER FABRIC

PART 1 – GENERAL

1.1 WORK INCLUDED:

- 1.2.1 This item shall consist of furnishing all labor, equipment and materials necessary to install geotextile filter fabric below the filter layer of concrete slabs, as shown on the Contract Drawings.

1.3 RELATED WORK

- 1.3.1 Section 03 30 00 – Cast-In-Place Concrete
- 1.3.2 Section 31 23 00 – Excavation, Grading, & Slope Preparation

1.4 SUBMITTALS

- 1.4.1 Submit manufacturer's literature and sample of geotextile fabric to the Engineer for approval prior to purchasing material.

PART 2 – PRODUCTS

- 2.1.1 **MATERIALS:** Geotextile filter fabric shall be a nonwoven, needle-punched polypropylene fabric with the following listed minimum properties:

Fabric Property	Unit	Test Method	Physical Properties
Minimum tensile strength	LBS	ASTM D 4632	200
Minimum elongation	%	ASTM D 4632	15%
Minimum puncture strength	LBS	ASTM D 6241	440
Minimum tear strength	LBS	ASTM D 4533	50
Apparent opening size	Mils	ASTM D 4751	24
Minimum permittivity	Sec ⁻¹	ASTM D 4491	0.2 sec ⁻¹

PART 3 – EXECUTION

3.1 SHIPMENT AND STORAGE

- 3.1.1 During all periods of shipment and storage, the fabric shall be protected from direct sunlight, ultraviolet rays, temperatures greater than 140° F, mud, dirt, dust and debris. To the extent possible, the fabric shall be maintained wrapped in a heavy duty protective covering.

3.2 INSTALLATION

- 3.2.1 The geotextile filter fabric shall be placed as shown on the Contract Drawings. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.
- 3.2.2 Overlap – Geotextile filter fabric shall be overlapped a minimum of two (2) feet at each seam.

PART 4 – PAYMENT

4.1 GEOTEXTILE FILTER FABRIC

4.1.1 Payment shall be by Lump Sum.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 – GENERAL

1.1 WORK INCLUDED

- 1.1.1 This work consists of clearing, grubbing, scalping, removing trees and stumps, and removing all vegetation and construction debris from the footprint of the proposed structure or area to be included in the new vegetated slope, except such objects that are to remain or are to be removed according to other items of work.
- 1.1.2 All removed items shall be disposed of at the Contractor's expense.

1.2 GENERAL

- 1.2.1 Remove or save all trees, shrubs, and plants as designated on the plans. Preserve all vegetation and objects not designated for removal. Paint cut or scarred surfaces of trees or shrubs selected for retention according to ODOT Item 666.04.
- 1.2.2 In order to retard and prevent the spread of destructive insects, including the emerald ash borer and Asian longhorned beetle, limit the movement of regulated articles according to Ohio Administrative Codes 901:5-56 and 901:5-57. Observe requirements for handling and transporting of regulated articles in quarantined areas as defined by the Ohio Department of Agriculture (www.agri.ohio.gov).
- 1.2.2.1 The following are considered regulated articles and are subject to the quarantine established by the Ohio Department of Agriculture:
 - 1.2.2.1.1 Deciduous trees of any size
 - 1.2.2.1.2 Deciduous limbs and branches
 - 1.2.2.1.3 Any cut non-coniferous (non-evergreen) firewood.
 - 1.2.2.1.4 Deciduous tree bark and deciduous tree wood chips larger than 1 inch (25 mm).
 - 1.2.2.1.5 Deciduous logs and lumber with the bark, outer inch of sapwood, or both attached.
 - 1.2.2.1.6 Any item made from or containing deciduous tree wood capable of spreading emerald ash borer or Asian longhorned beetle.
 - 1.2.2.1.7 Any means of conveyance capable of spreading emerald ash borer or Asian longhorned beetle.
- 1.2.3 Follow all other federal and state emerald ash borer and Asian Longhorned beetle quarantines
- 1.2.4 Restrictions on when the contractor may perform the clearing and grubbing work are located in other parts of the Contract Documents. Please refer to U.S. Army Corps of Engineers permits for environmental conditions.
 - 1.2.4.1 To reduce potential adverse effects on the Federally endangered Indiana bat (*Myotis sodalis*), trees (woody stems greater than 5 inches in diameter at breast height) shall not be cut between April 1 and September 30, of any year.

- 1.2.4.2 To reduce any potential adverse effects on the Federally threatened Northern long-eared bat (*Myotis septentrionalis*), trees (woody stems greater than 2 inches in diameter at breast height) shall not be cut between April 1 and September 30, of any year.
- 1.2.4.3 To avoid and minimize any potential adverse effects to warblers, the clearing, removal and/or modification of any scrub/shrub or forested habitat shall not occur between April 22nd to June 1st and August 15th to October 15th of any year. All site clearing shall be performed between October 16 and March 31.

1.3 TREE REMOVAL, CLEARING AND GRUBBING

- 1.3.1 Clear and grub all trees and stumps marked for removal and all surface objects, brush, roots, and other protruding obstructions not designated to remain, except for special treatments listed:
 - 1.3.1.1 In locations to be seeded, remove stumps at least 6 inches (150 mm) below ground surface.
 - 1.3.1.2 In unseeded areas to be rounded at the top of backslopes, cut the stumps flush with or below the surface of the final slope line.
 - 1.3.1.3 The Contractor may leave undisturbed stumps and roots, and nonperishable solid objects 6 inches (150 mm) above the existing ground surface in the plan embankment construction locations when the embankment height is greater than 9 feet (3 m) as measured vertically from the existing ground surface to the proposed ground surface, and
 - 1.3.1.4 In locations outside of the construction limits of the cut and embankment areas not to be seeded, the Contractor may leave sound stumps 24 inches (0.6 m) above the existing ground surface.
- 1.3.2 Except in areas to be excavated, backfill stump holes and other holes created by removing obstructions with ODOT Item 203 embankment material. Place and compact according to ODOT Item 203.
- 1.3.3 Remove low hanging, unsound, or unsightly branches on trees or shrubs designated to remain. Trim branches of trees extending over the roadbed to provide a clear height of 20 feet (6 m) above the roadbed surface.
- 1.3.4 Dispose of debris contaminated with garbage, solid waste, or hazardous waste or material according to other contract items.

1.4 METHOD OF MEASUREMENT

- 1.4.1 If Clearing and Grubbing is specified in the Contract, the Owner will not measure the area cleared and grubbed.
- 1.4.2 If Tree Removal is specified in the Contract, the Owner will measure trees and stumps designated for removal according to the following table.

Tree or Stump Diameter	Pay Item Designation
Over 12 inches to 24 inches	18-inch size
Over 24 inches to 36 inches	30-inch size
Over 36 inches to 60 inches	48-inch size
Over 60 inches	60-inch size

- 1.4.3 The Owner will measure the diameter of trees at a height of 54 inches (1.4 m) above the ground. Trees 12 inches (0.3 m) and less in diameter are classified as brush. The Owner will measure stumps by taking the average diameter at the cutoff.

1.5 BASIS OF PAYMENT

- 1.6.1 If Clearing and Grubbing is specified in the Contract, the Owner will pay for all work described, including backfilling holes, scalping, and removing all trees and stumps, at the lump sum price bid.

END OF SECTION

SECTION 31 23 00

EXCAVATION, GRADING AND SLOPE PREPARATION

PART 1 – GENERAL

1.1 WORK INCLUDED

- 1.1.1 Excavation, grading and slope preparation shall include:
 - 1.1.1.1 Excavation of all material in the footprint of the proposed structures.
 - 1.1.1.2 Grading and slope preparation from the top of the bluff to the new Redi-Rock wall on the western side of the project area as shown on the drawings.

1.2 EXISTING CONDITIONS

- 1.2.1 Conduct excavation, grading and slope preparation within the construction limits to minimize interference with adjacent structures.

1.3 SUBMITTALS

- 1.3.1 N/A

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 EXCAVATION

- 3.1.1 Excavate to the grades shown on the Contract Drawings and grade and slope as necessary.

PART 4 – PAYMENT

4.1 EXCAVATION, GRADING AND SLOPE PREPARATION

- 4.1.1 Payment for all work performed under this section will be by the lump sum bid price for Excavation, Grading and Slope Preparation.

END OF SECTION

SECTION 31 25 00

EROSION & SEDIMENTATION CONTROL

PART 1 – GENERAL

1.1 WORK INCLUDED

- 1.1.1 This item shall consist of furnishing all labor, equipment and materials necessary to install, maintain and remove upon completion of the project all items required in the Storm Water Pollution Prevention Plan included in the Contract Drawings.
- 1.1.2 The Erosion and Sedimentation Control Drawings included in the Contract Documents is the minimum requirement to be implemented. Provide additional control as necessary to meet applicable local and State criteria or as required to complete the work.

1.2 RELATED WORK

- 1.2.1 Section 31 23 00 Excavation, Grading & Slope Preparation

1.3 SUBMITTALS

- 1.3.1 The Contractor shall be responsible for submitting the required Notice of Intent to the Ohio Environmental Protection Agency and obtaining approval prior to commencing work.
- 1.3.2 Submit for approval by the Engineer complete manufacturer's published descriptive literature and specifications for all products specified herein and utilized on the project.

1.4 QUALITY ASSURANCE

- 1.4.1 Regulatory Requirements: Comply with applicable local, State and Federal ordinances, rules and regulations concerning sedimentation control and storm water runoff.
- 1.4.2 In case of conflict between the above codes, regulations, references and standards and these specifications, the more stringent requirements shall govern.

1.5 PROJECT SITE CONDITIONS

- 1.5.1 Existing Conditions: Verify all existing conditions affecting the work of this section prior to submitting bids or proposals. Additional compensation will not be allowed for revisions or modification of work resulting from failure to verify existing conditions.

1.6 MAINTENANCE REQUIREMENTS

- 1.6.1 Temporary Erosion and Sediment Control measures shall be maintained until permanent measures are in place or no longer necessary due to project completion. All damaged, disturbed or devices filled with sediment, which may occur within the construction period, shall be corrected at no cost to the Owner. Any devices damaged by erosion or sediment shall be restored to their original condition by the Contractor, at no cost to the Owner.

PART 2 – PRODUCTS

2.1 SILT FENCE

- 2.1.1 Silt fence shall be furnished and installed around the perimeter of all material staging areas as specified on the Contract Drawings.

PART 3 – EXECUTION

3.1 EROSION & SEDIMENTATION CONTROL

- 3.1.1 The Contractor shall perform all items specified in the Contract Documents to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties. Including the prevention of soil, silts, organics entering catch basins around and near the site.
- 3.1.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- 3.1.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 4 – PAYMENT

4.1 EROSION & SEDIMENTATION CONTROL

- 4.1.1 Payment for execution of the Erosion & Sedimentation Control shall be by lump sum.

4.2 PAYMENT ITEMS

- 4.2.1 Payment Item - Erosion & Sedimentation Control Lump Sum

END OF SECTION

SECTION 31 41 16

STEEL SHEET PILING

PART 1 – GENERAL

1.1 WORK INCLUDED:

- 1.1.1 Furnish all plant, labor and materials as noted herein and perform all operations required to install steel sheet piling, in accordance with the requirements specified herein and the contract drawings.

1.2 APPLICABLE PUBLICATIONS:

- 1.2.1 American Society for Testing and Materials Standards (ASTM):
- ASTM A 6/A 6M (2004b) General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
- A36/A36M Structural Steel
- A572/A572M Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

1.3 RELATED WORK:

- 1.3.1 05 12 00 Structural Steel

1.4 SUBMITTALS:

- 1.4.1 Equipment Description: The Contractor shall submit complete descriptions of pile driving equipment, including hammers (manufacturer's general information, operating instructions, testing procedures, etc.), extractors and other appurtenances to the Engineer prior to the commencement of work.
- 1.4.2 Steel sheet piling corners/specials are commercially available off the shelf, field fabrication of corners or on-site fabrications are not required.
- 1.4.3 Field Fabricated Connections: The Contractor shall submit shop drawings for field fabricated connections required to connect interlock the new steel sheet piling.
- 1.4.4 No steel sheet piling connections are required to existing bulkheads – all bulkheads are new construction.

1.5 DELIVERY, STORAGE AND HANDLING

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified mill 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 should also facilitate required inspection activities.

1.6 QUALIFICATION OF WELDERS AND WELDING OPERATORS

The Contractor shall certify that the qualification of welders and welding operators and tack welders who will perform structural steel welding have been qualified for the particular type of work and position to be done in accordance with the requirements of AWS D1.1/D1.1M, Section 5, prior to commencing fabrication. The certificate shall list the qualified welders by name and shall specify the code and procedures under which qualified and the date of qualification. Prior qualification will be accepted if welders have performed satisfactory work under the code for which qualified within the preceding three months. The Contractor shall require welders to repeat the qualifying tests when their work indicates a reasonable doubt as to proficiency. Those passing the requalification tests will be recertified. Those not passing will be disqualified until passing. All expenses in connection with qualification and requalification shall be borne by the Contractor.

PART 2 - MATERIALS

2.1 STEEL SHEET PILING

2.1.1 Steel for sheet piling shall conform to the requirements of A572 Grade 50 for the SCZ 12 or equal. Sheet piling shall be new and of the type indicated on the drawings and be of a design such that when in place they will be continuously interlocked throughout their entire length. Piles shall be supplied in un-spliced lengths as specified on the drawings unless otherwise indicated. All piling shall be provided with standard pulling holes located approximately four (4) inches below the top of the pile, unless otherwise shown or directed. Piling shall have the minimum properties equivalent to those listed in the following table:

Type of Section	Nominal Web Thickness (Inches)	Driving Width (Inches)	Weight Per Sq. Ft. of Wall (Lbs.)	Weight Per Lin. Ft. of Wall (In.3)
SCZ-12 (Skyline) (or approved equal)	0.2	28.5	11.37	27.01

2.2 DEADMAN WALL

2.2.1 This section is unused.

2.3 H-PILES

2.3.1 This section is unused.

2.3 TIE RODS

2.3.1 This section is unused.

PART 3 – EXECUTION

3.1 PLACING AND DRIVING PERMANENT PILING:

3.1.1 **Placing:** Piling shall be carefully located as shown on the drawings or as directed by the Engineer. Contractor shall clear the driving line prior to driving piling. Piles shall be placed in a plumb position with each pile interlocked with adjoining piles for its entire length, to form a continuous diaphragm throughout the length of the piles. Piles driven out of interlock with adjacent piles or otherwise damaged shall be removed and replaced by new piles at the Contractor's expense.

3.1.2 **Driving:** Piles shall be driven by approved methods in such manner as not to subject the piles to serious damage and to insure proper interlocking throughout the length of the piles. Pile hammers shall be maintained in proper alignment during driving operations by use of suitable leads or by guides attached to the hammer. A driving helmet/cap shall be employed in driving, when required, to prevent damage to the top of the piles; pile cap shall be suited for the type of pile being driven. All piles shall be driven without the aid of a water jet, unless otherwise authorized. Adequate precautions shall be taken to ensure that piles are driven plumb. Each run of piling shall be driven to grade progressively from the start and no piles shall be driven to a lower grade than those behind it in the same run except when the piles behind it cannot be driven deeper. If the pile next to the one being driven tends to follow below final grade, it may be pinned to the next adjacent pile.

Should boulders or other obstructions render it impracticable to drive a pile to the specified penetration, the Contractor shall remove the boulders or obstructions, as directed by the Engineer, to insure the adequacy and stability of the structure.

3.2 CUTTING AND SPLICING: Piles driven below the elevations indicated for the top of piles, and piles which because of damaged heads have been cut off to permit further elevation, shall be extended to the required top elevation by splicing an additional length, when directed, without cost to the Owner. Piles adjoining spliced piles shall be full length piles. The Contractor shall cut off the tops of piles excessively battered during driving, when directed to do so, at no cost to the Owner. Cut offs shall become the property of the Contractor and shall be removed from the work. The Contractor may cut holes in the piles for bolts, rods, drains, or utilities at locations and of sizes shown on the drawings or as directed. All cutting shall be performed in a neat and workmanlike manner. Bolt holes shall be drilled or may be burned and reamed in place by approved methods which will not damage remaining metal. Holes other than bolt holes, shall be reasonably smooth and of proper size for rods or other items to be inserted. Any holes in the piling, other than the holes shown on the contract drawings, shall be plugged by welding 3/8-inch steel plates over the holes on the inside face of the piling. Cutting holes through interlocks will not be permitted.

3.3 PULLING AND REDRIVING: The Engineer may require the Contractor to pull certain selected piles after driving for test and inspection, to determine the conditions of the piles. Any pile so pulled and found to be damaged to such extent as would impair its usefulness in the structure, as determined by the Engineer, shall be removed from the work, and the Contractor shall furnish and drive another pile to replace the damaged pile. Piles pulled and found to be in a satisfactory condition shall be re-driven.

END OF SECTION

SECTION 32321

PRECAST MODULAR BLOCK RETAINING WALL

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes furnishing all materials and labor required for construction of a precast concrete modular block (PMB) retaining wall without geosynthetic reinforcement. Precast modular block retaining wall blocks under this section shall be cast utilizing a wet-cast concrete mix and exhibit a final handling weight in excess of 1,000 pounds (450 kg) per unit.
- B. Scope of Work: The work shall consist of furnishing materials, labor, equipment and supervision for the construction of a precast modular block (PMB) retaining wall structure in accordance with the requirements of this section and in acceptable conformity with the lines, grades, design and dimensions shown in the Contract Drawings.

1.2 PRICE AND PAYMENT PROCEDURES

- A. Allowances. No allowance shall be made in the price of the retaining wall for excavation beyond the limits required for retaining wall construction as shown on the Contract Drawings. The cost of excavation for the purposes of site access shall be the responsibility of the Contractor. Removal of unsuitable soils and replacement with select fill shall be as directed and approved in writing by the Engineer and shall be paid under the lump sum for Excavation and removal of clay and shale material.
- B. Measurement and Payment.
 - 1. The unit of measurement for furnishing the precast modular block retaining wall system shall be by lump sum.

1.3 REFERENCES

- A. If conflicts exist between the specifications and reference documents; the Engineer will make the final determination of the applicable document.
- B. Reference Standards
 - 1. State of Ohio, Department of Transportation, Construction and Material Specifications, January 1, 2019
 - 2. Precast Modular Block Units
 - a. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
 - b. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - c. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - d. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
 - e. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
 - f. ASTM C666 – Standard Test Method for Concrete Resistance to Rapid Freezing and Thawing.
 - g. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.

- h. ASTM C1116 – Standard Specification for Fiber-Reinforced Concrete.
 - i. ASTM C1611 – Standard Test Method for Slump Flow of Self-Consolidating Concrete.
 - j. ASTM D6638 – Standard Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units (Modular Concrete Blocks).
 - k. ASTM D6916 – Standard Test Method for Determining Shear Strength Between Segmental Concrete Units (Modular Concrete Blocks).
3. Geosynthetics
- a. AASHTO M 288 – Geotextile Specification for Highway Applications.
 - b. ASTM D3786 – Standard Test Method for Bursting Strength of Textile Fabrics Diaphragm Bursting Strength Tester Method.
 - c. ASTM D4354 – Standard Practice for Sampling of Geosynthetics for Testing.
 - d. ASTM D4355 – Standard Test Method for Deterioration of Geotextiles
 - e. ASTM D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - f. ASTM D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
 - g. ASTM D4595 – Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - h. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
 - i. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile.
 - j. ASTM D4759 – Standard Practice for Determining Specification Conformance of Geosynthetics.
 - k. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
 - l. ASTM D4873 – Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
 - m. ASTM D5262 – Standard Test Method for Evaluating the Unconfined Tension Creep and Creep Rupture Behavior of Geosynthetics.
 - n. ASTM D5321 – Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method.
 - o. ASTM D5818 – Standard Practice for Exposure and Retrieval of Samples to Evaluate Installation Damage of Geosynthetics.
 - p. ASTM D6241 – Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.
 - q. ASTM D6637 – Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method.
 - r. ASTM D6706 – Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil.
 - s. ASTM D6992 – Standard Test Method for Accelerated Tensile Creep and Creep-Rupture of Geosynthetic Materials Based on Time-Temperature Superposition Using the Stepped Isothermal Method.

4. Soils
 - a. AASHTO M 145 – AASHTO Soil Classification System.
 - b. AASHTO T 104 – Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.
 - c. AASHTO T 267 – Standard Method of Test for Determination of Organic Content in Soils by Loss of Ignition.
 - d. ASTM C33 – Standard Specification for Concrete Aggregates.
 - e. ASTM D422 – Standard Test Method for Particle-Size Analysis of Soils.
 - f. ASTM D448 – Standard Classification for Sizes of Aggregates for Road and Bridge Construction.
 - g. ASTM D698 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. (12,400 ft-lbf/ft (2,700 kN-m/m)).
 - h. ASTM D1241 – Standard Specification for Materials for Soil-Aggregate Subbase, Base and Surface Courses.
 - i. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
 - j. ASTM D1557 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort. (56,000 ft-lbf/ft (2,700 kN-m/m)).
 - k. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 - l. ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).
 - m. ASTM D3080 – Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions.
 - n. ASTM D4254 – Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
 - o. ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
 - p. ASTM D4767- Test Method for Consolidated-Undrained Triaxial Compression Test for Cohesive Soils.
 - q. ASTM D4972 – Standard Test Method for pH of Soils.
 - r. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Aggregate by Nuclear Methods (Shallow Depth).
 - s. ASTM G51 – Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing.
 - t. ASTM G57 – Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method.
5. Drainage Pipe
 - a. ASTM D3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - b. ASTM F2648 – Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications.

1.4 SUBMITTALS

- A. Product Data. At least 14 days prior to construction, the Contractor shall submit a minimum of two (2) copies of the retaining wall product submittal package to the Engineer for review and approval.

The submittal package shall include technical specifications and product data from the manufacturer for the following:

1. Precast Modular Block System brochure
2. Precast Modular Block concrete test results specified in paragraph 2.1, subparagraph B of this section as follows:
 - a. 28-day compressive strength
 - b. Air content
 - c. Slump or Slump Flow (as applicable)
3. Drainage Pipe
4. Geotextile

- B. Installer Qualification Data. At least 14 days prior to construction, the Contractor shall submit the qualifications of the entity responsible for installation of the retaining wall per paragraph 1.5, subparagraph A of this section.

1.5 QUALITY ASSURANCE

- A. Contractor Qualifications. In order to demonstrate basic competence in the construction of precast modular block walls, the Contractor shall document compliance with the following:
1. Experience.
 - a. Construction experience with a minimum of 30,000 square feet (2,800 square meters) of the proposed precast modular block retaining wall system.
 - b. Construction of at least ten (10) precast modular block (large block) retaining wall structures within the past three (3) years.
 - c. Construction of at least 50,000 square feet (4,650 square meters) of precast modular block (large block) retaining walls within the past three (3) years.
 2. Contractor experience documentation for each qualifying project shall include:
 - a. Project name and location
 - b. Date (month and year) of construction completion
 - c. Contact information of Owner or General Contractor
 - d. Type (trade name) of precast modular block system built
 - e. Maximum height of the wall constructed
 - f. Face area of the wall constructed
 3. In lieu of the requirements set forth in items 1 and 2 above, the Contractor must be a certified Precast Modular Block Retaining Wall Installation Contractor as demonstrated by satisfactory completion of a certified precast modular block retaining wall installation training program administered by the precast modular block manufacturer.

1.6 QUALITY CONTROL

- A. The Engineer shall review all submittals for materials and Contractor qualifications.
- B. The Contractor shall inspect the on-site grades and excavations prior to construction and notify the Engineer if on-site conditions differ from the elevations and grading conditions depicted in the Contract Drawings.

1.7 DELIVERY, STORAGE AND HANDLING

- A. The Contractor shall inspect the materials upon delivery to ensure that the proper type, grade and color of materials have been delivered.
- B. The Contractor shall store and handle all materials in accordance with the manufacturer's recommendations as specified herein and in a manner that prevents deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, UV exposure or other causes. Damaged materials shall not be incorporated into the work.
- C. Geosynthetics
 - 1. All geosynthetic materials shall be handled in accordance with ASTM D4873. The materials should be stored off the ground and protected from precipitation, sunlight, dirt and physical damage.
- D. Precast Modular Blocks
 - 1. Precast modular blocks shall be stored in an area with positive drainage away from the blocks. Be careful to protect the block from mud and excessive chipping and breakage. Precast modular blocks shall not be stacked more than three (3) units high in the storage area.
- E. Drainage Aggregate and Backfill Stockpiles
 - 1. Drainage aggregate or backfill material shall not be piled over unstable slopes or areas of the project site with buried utilities.
 - 2. Drainage aggregate and/or reinforced fill material shall not be staged where it may become mixed with or contaminated by poor draining fine-grained soils such as clay or silt.

PART 2 – MATERIALS

2.1 PRECAST MODULAR BLOCK RETAINING WALL UNITS

- A. All units for the project shall be obtained from the same manufacturer. The manufacturer shall be licensed and authorized to produce the retaining wall units by the precast modular block system patent holder/licensor and shall document compliance with the published quality control standards of the proprietary precast modular block system licensor for the previous three (3) years or the total time the manufacturer has been licensed, whichever is less.
- B. Concrete used in the production of the precast modular block units shall be first-purpose, fresh concrete. It shall not consist of returned, reconstituted, surplus or waste concrete. It shall be an original production mix meeting the requirements of ASTM C94 and exhibit the following:
 - 1. Minimum 28-day compressive strength of 4,000 psi (27.6 MPa).
 - 2. Shall be free of water soluble chlorides and chloride based accelerator admixtures.
 - 3. 6% +/- 1½% air-entrainment in conformance ASTM C94.
 - 4. Maximum slump of 5 inches +/- 1½ inches (125 mm +/- 40 mm) per ASTM C143 for conventional concrete mix designs.
 - 5. Slump Flow for Self-Consolidating Concrete (SCC) mix designs shall be between 18 inches and 32 inches (450 mm and 800 mm) as tested in accordance with ASTM C1611.
- C. Each concrete block shall be cast in a single continuous pour without cold joints. With the exception of half-block units, corner units and other special application units, the precast modular block units

shall conform to the nominal dimensions listed in the table below and be produced to the dimensional tolerances shown.

Block Type	Dimension	Nominal Value	Tolerance
28" (710 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	28" (710 mm)	+/- 1/2" (13 mm)
41" (1030 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	40-1/2" (1030 mm)	+/- 1/2" (13 mm)
60" (1520 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	60" (1520 mm)	+/- 1/2" (13 mm)

* Excluding Variable Face Texture

- D. Individual block units shall have a nominal height of 18 inches (457 mm).
- E. With the exception of half-block units, corner units and other special application units, the precast modular block units shall have two (2), circular dome shear knobs that are 10 inches (254 mm), 7.5 inches (190 mm), or 6.75 inches (171 mm) in diameter and 4 inches (102 mm) or 2 inches (51 mm) in height. The shear knobs shall fully index into a continuous semi-cylindrical shear channel in the bottom of the block course above. The Peak interlock shear between any two (2) vertically stacked precast modular block units, with 10 inch (254 mm) diameter shear knobs, measured in accordance with ASTM D6916 shall exceed 6,500 lb/ft (95 kN/m) at a minimum normal load of 500 lb/ft (7kN/m). as well as an ultimate peak interface shear capacity in excess of 11,000 lb/ft (160 kN/m). The peak interlock shear between any two (2) vertically stacked precast modular block units, with 7.5 inch (190 mm) or 6.75 inch (171 mm) diameter shear knobs, measured in accordance with ASTM D6916 shall exceed 1,850 lb/ft (27 kN/m) at a minimum normal load of 500 lb/ft (7kN/m) as well as an ultimate peak interface shear capacity in excess of 10,000 lb/ft (146 kN/m). Test specimen blocks tested under ASTM D6916 shall be actual, full-scale production blocks of known compressive strength. The interface shear capacity reported shall be corrected for a 4,000 psi (27.6 MPa) concrete compressive strength. Regardless of precast modular block configuration, interface shear testing shall be completed without the inclusion of unit core infill aggregate.
- F. Without field cutting or special modification, the precast modular block units shall be capable of achieving a minimum radius of 14 ft 6 in (4.42 m).
- G. The precast modular block units shall be manufactured with integrally cast shear knobs that establishes a standard horizontal set-back for subsequent block courses. The precast modular block system shall be available in the four (4) standard horizontal set-back facing batter options listed below:

<u>Horizontal Set-Back/Blk. Course</u>	<u>Max. Facing Batter</u>
3/8" (10 mm)	1.2°
1-5/8" (41 mm)	5.2°
9-3/8" (238 mm)	27.5°
16-5/8" (422 mm)	42.7°

The precast modular block units shall be furnished with the required shear knobs that provide the facing batter required in the Contract Drawings.

- I. The precast modular block unit face texture shall be selected by the owner from the available range of textures available from the precast modular block manufacturer. Each textured block facing unit shall be a minimum of 5.76 square feet (0.54 square meters) with a unique texture pattern that repeats with a maximum frequency of once in any 15 square feet (1.4 square meters) of wall face.
- J. The block color shall be selected by the owner from the available range of colors available from the precast modular block manufacturer.
- K. All precast modular block units shall be sound and free of cracks or other defects that would interfere with the proper installation of the unit, impair the strength or performance of the constructed wall. PMB units to be used in exposed wall construction shall not exhibit chips or cracks in the exposed face or faces of the unit that are not otherwise permitted.
- L. Preapproved Manufacturers.
 - 1. Manufacturers of Redi-Rock Retaining Wall Systems as licensed by Redi-Rock International, LLC, 05481 US 31 South, Charlevoix, MI 49720 USA; telephone (866) 222-8400; website www.redi-rock.com.
- M. Substitutions. Technical information demonstrating conformance with the requirements of this specification for an alternative precast modular block retaining wall system must be submitted for preapproval at least 14 calendar days prior to the bid date. Acceptable alternative PMB retaining wall systems, otherwise found to be in conformance with this specification, shall be approved in writing by the Engineer 7 days prior to the bid date. The Engineer reserves the right to provide no response to submissions made out of the time requirements of this section or to submissions of block retaining wall systems that are determined to be unacceptable to the owner.

2.2 GEOTEXTILE

- A. Geotextile filter fabric shall conform to ODOT Item 712 Type D.

2.3 DRAINAGE AGGREGATE AND WALL BACKFILL

- A. Drainage aggregate (and wall infill for retaining walls designed as modular gravity structures) shall be a durable crushed stone conforming to No. 57 size per ASTM C33 with the following particle-size distribution requirements per ASTM D422:

U.S. Standard <u>Sieve Size</u>	<u>% Passing</u>
1-½" (38 mm)	100
1" (25 mm)	95-100
½" (13 mm)	25-60
No. 4 (4.76 mm)	0-10
No. 8 (2.38 mm)	0-5

2.4 LEVELING PAD

- A. The precast modular block units shall be placed on a leveling pad constructed from reinforced concrete. The leveling pad shall be constructed to the dimensions and limits shown on the Contract Drawings.
- B. Concrete used for construction of the reinforced concrete leveling pad shall have a minimum 28-day compressive strength of 4,000 psi. The concrete shall be cured a minimum of 12 hours prior to placement of the precast modular block wall retaining units.

2.5 DRAINAGE

- A. Drainage Pipe
 - 1. Drainage collection pipe shall be a 4" (100 mm) diameter, 3-hole perforated, HDPE pipe with a minimum pipe stiffness of 22 psi (152 kPa) per ASTM D2412.
 - 2. The drainage pipe shall be manufactured in accordance with ASTM D1248 for HDPE pipe and fittings.

PART 3 – EXECUTION

3.1 GENERAL

- A. The Contractor shall be responsible for work site safety. All work shall be performed in accordance with OSHA safety standards, state and local building codes and manufacturer's requirements.
- B. The Contractor is responsible for the location and protection of all existing underground utilities. The Contractor shall coordinate the work of subcontractors affected by this requirement.
- C. The Contractor is responsible to ensure that safe excavations and embankments are maintained throughout the course of the project.

3.2 EXAMINATION

- A. Prior to construction, the Contractor and all subcontractors shall examine the areas in which the retaining wall will be constructed to evaluate compliance with the requirements for installation tolerances, worker safety and any site conditions affecting performance of the completed structure. Installation shall proceed only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Excavation.
 - 1. The Contractor shall excavate to the lines and grades required for construction of the precast modular block retaining wall as shown on the Contract Drawings. The Contractor shall minimize over-excavation. Excavation support, if required, shall be the responsibility of the Contractor.
- B. Foundation Preparation.
 - 1. Prior to construction of the precast modular block retaining wall, the leveling pad area and undercut zone (if applicable) shall be cleared and grubbed. All topsoil, brush, frozen soil and organic material shall be removed. Additional foundation soils found to be unsatisfactory

beyond the specified undercut limits shall be undercut and replaced with approved fill as directed by the Engineer.

C. Leveling Pad.

1. The leveling pad shall be constructed to provide a level, hard surface on which to place the first course of precast modular block units. The leveling pad shall be placed in the dimensions shown on the Contract Drawings and extend to the limits indicated.
2. Reinforced Concrete Leveling Pad. The Contractor shall erect proper forms as required to ensure the accurate placement of the concrete leveling pad according to the Contract Drawings.

3.4 PRECAST MODULAR BLOCK WALL SYSTEM INSTALLATION

A. The precast modular block structure shall be constructed in accordance with the Contract Drawings, these specifications and the recommendations of the retaining wall system component manufacturers. Where conflicts exist between the manufacturer's recommendations and these specifications, these specifications shall prevail.

B. Drainage components. Pipe, geotextile and drainage aggregate shall be installed as shown on the Contract Drawings.

C. Precast Modular Block Installation

1. The first course of block units shall be placed with the front face edges tightly abutted together on the prepared leveling pad at the locations and elevations shown on the Contract Drawings. The Contractor shall take special care to ensure that the bottom course of block units are in full contact with the leveling pad, are set level and true and are properly aligned according to the locations shown on the Contract Drawings.
2. Backfill shall be placed in front of the bottom course of blocks prior to placement of subsequent block courses. Nonwoven geotextile fabric shall be placed in the V-shaped joints between adjacent blocks. Drainage aggregate shall be placed in the V-shaped joints between adjacent blocks to a minimum distance of 12" (300 mm) behind the block unit.
3. Drainage aggregate shall be placed in 9 inch maximum lifts and compacted by a minimum of three (3) passes of a vibratory plate compactor capable exerting a minimum of 2,000 lb (8.9 kN) of centrifugal force.
4. Nonwoven geotextile fabric shall be placed between the drainage aggregate and the retained soil (gravity wall design) as required on the Contract Drawings.
5. Subsequent courses of block units shall be installed with a running bond (half block horizontal course-to-course offset). With the exception of 90-degree corner units, the shear channel of the upper block shall be fully engaged with the shear knobs of the block course below. The upper block course shall be pushed forward to fully engage the interface shear key between the blocks and to ensure consistent face batter and wall alignment. Drainage aggregate, geotextile and properly compacted backfill shall be complete and in-place for each course of block units before the next course of blocks is stacked.
6. The elevation of retained soil fill shall not be less than 1 block course (18" (457 mm)) below the elevation of the reinforced backfill throughout the construction of the retaining wall.

D. Construction Tolerance. Allowable construction tolerance of the retaining wall shall be as follows:

1. Deviation from the design batter and horizontal alignment, when measured along a 10' (3 m) straight wall section, shall not exceed 3/4" (19 mm).

2. Deviation from the overall design batter shall not exceed 1/2" (13 mm) per 10' (3 m) of wall height.
3. The maximum allowable offset (horizontal bulge) of the face in any precast modular block joint shall be 1/2" (13 mm).
4. The base of the precast modular block wall excavation shall be within 2" (50 mm) of the staked elevations, unless otherwise approved by the Engineer.
5. Differential vertical settlement of the face shall not exceed 1' (300 mm) along any 200' (61 m) of wall length.
6. The maximum allowable vertical displacement of the face in any precast modular block joint shall be 1/2" (13 mm).
7. The wall face shall be placed within 2" (50 mm) of the horizontal location staked.

3.5 BACKFILL PLACEMENT

- A. Backfill material placed immediately behind the drainage aggregate shall be compacted as follows:
 1. 98% of maximum dry density at $\pm 2\%$ optimum moisture content per ASTM D698 standard proctor or 85% relative density per ASTM D4254.
- B. Compactive effort within 3' (0.9 m) of the back of the precast modular blocks should be accomplished with walk-behind compactors. Compaction in this zone shall be within 95% of maximum dry density as measured in accordance with ASTM D698 standard proctor or 80% relative density per ASTM D 4254. Heavy equipment should not be operated within 3' (0.9 m) of the back of the precast modular blocks.
- C. Backfill material shall be installed in lifts that do not exceed a compacted thickness of 9" (230 mm).
- D. At the end of each workday, the Contractor shall grade the surface of the last lift of the granular wall infill to a $3\% \pm 1\%$ slope away from the precast modular block wall face and compact it.
- E. The Contractor shall protect the precast modular block wall structure against surface water runoff at all times through the use of berms, diversion ditches, silt fence, temporary drains and/or any other necessary measures to prevent soil staining of the wall face, scour of the retaining wall foundation or erosion of the reinforced backfill or wall infill.

3.6 OBSTRUCTIONS

- A. The Contractor shall make all required allowances for obstructions behind and through the wall face in accordance with the Contract Drawings.
- B. Should unplanned obstructions become apparent for which the Contract Drawings do not account, the affected portion of the wall shall not be constructed until the Engineer can appropriately address the required procedures for construction of the wall section in question.

3.7 COMPLETION

- A. For walls supporting unpaved areas, a minimum of 12" (300 mm) of compacted, low-permeability fill shall be placed over the granular wall infill zone of the precast modular block retaining wall structure. The adjacent retained soil shall be graded to prevent ponding of water behind the completed retaining wall.

- B. The Contractor shall confirm that the as-built precast modular block wall geometries conform to the requirements of this section.

END OF SECTION