



Bid Book

For

Trail Lake Park – Trailhead and Trails

605 Ravenna Road, Streetsboro, Portage County, Ohio

Portage Park District

705 Oakwood St.

Suite G-4

Ravenna, Ohio 44266

(330) 297-7728

admin@portageparkdistrict.org

portageparkdistrict.org

May 28, 2020

CHARLES ENGELHART
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CHRISTINE CRAYCROFT

COMMISSIONER
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COMMISSIONER
COMMISSIONER
EXECUTIVE DIRECTOR

Project Engineer: Dustin Doherty, P.E.
Civil and Environmental Consultants, Inc.
250 Old Wilson Bridge Road, Suite 250
Worthington, OH 43085

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**LEGAL NOTICE
PORTAGE PARK DISTRICT
TRAIL LAKE PARK – TRAILHEAD AND TRAILS**

NOTICE TO BIDDERS

The Portage Park District will receive sealed bids for the above-mentioned project at the office of the Portage Park District, 705 Oakwood St., Suite G-4, Ravenna, OH 44266 until **2:00 P.M.** Local Time on **Friday, June 19, 2020**, at which time the bids will be publicly opened and read aloud.

The Engineer is: Dustin Doherty, P.E. Civil and Environmental Consultants, Inc. 250 Old Wilson Bridge Road, Suite 250 Worthington, OH 43085; ddoherty@cecinc.com.

Bid instructions, Drawings, Project Manual, and Specifications will be available online at www.portageparkdistrict.org. Drawings can be viewed at the office as well - Portage Park District, 705 Oakwood St., Suite G-4, Ravenna, OH 44266, however no paper copies of the drawings will be distributed.

The work to be performed as part of this Contract: **The installation of a handicapped accessible trail and trailhead for Trail Lake Park.**

Each bidder shall be required to complete and file with his/her bid a Proposal Guaranty and Performance/Payment Bond Form (Section 153.571 of the Ohio Revised Code) with a Surety Company executing the Bond, which is listed on the Treasury Department's most current list (Circular 570 as amended) and authorized to transact business in the State where the project is based.

If the bid is accepted, the successful bidder shall enter into a contract and the Proposal Guaranty and Performance/Payment Bond shall provide the conditions in said bond, and as listed below:

(A) A Contract Performance Bond in an amount equal to 100% of the estimated cost of the work conditioned, among other things that the Contractor will perform the work upon the terms proposed, within the time prescribed, in accordance with the plans and specifications.

(B) A Payment Bond in an amount equal to 100% of the estimated cost of the work conditioned for the payment by the Contractor and all Sub-contractors for labor performed and materials furnished in connection with the project involved.

The Portage Park District reserves the right to reject any or all bids and waive any informalities in bidding. Bids of Corporations not chartered in Ohio must be accompanied by proper certification that such corporation is authorized to do business in Ohio.

All bidders must fill in all blanks of the proposal in ink or typewritten. The entire Bid Book must be submitted intact with the bid.

This Contract is subject to the provisions of Executive Order 11246 of September 24, 1965, as pertains to an Affirmative Action Plan, and Governor Executive Order of January 27, 1972. The successful low bidder will be required to comply with all Contract Requirements for Equal Employment Opportunities. Each bidder must insure that all employees and applicants for employment are not discriminated against because of race, color, creed, religion, sex, age, disability, national origin, ancestry or military status as defined in section 4112.01 of the Ohio Revised Code.

For the convenience of each prospective bidder, a **Pre-bid Conference has been scheduled on Friday, June 5th at 2:00 p.m. at the project site 605 Ravenna Road, Streetsboro, Ohio.**

PORTAGE PARK DISTRICT CHRISTINE CRAYCROFT, EXECUTIVE DIRECTOR

TO THE EDITOR: Please publish the foregoing on Thursdays, May 28, June 4th and June 11th and send proof of publication to Portage Park District, 705 Oakwood St. Suite G-4, Ravenna, Ohio 44266.

INFORMATION TO BIDDERS

1. Receipt and Opening of Bids:

The Portage Park District invites bids on the form attached hereto. All blanks must be appropriately filled in. **Bids will be received at the office of the Portage Park District until 2:00 PM local time, (time determined from Park District mobile phone), June 19, 2020 ,** and then shall be publicly opened and read aloud immediately thereafter. The envelopes containing the bids must be sealed, addressed, and designated as bid for ***“Trail Lake Park-Trailhead and Trails.”*** Bids shall be submitted in duplicate (original and one (1) copy). **The Portage Park District may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids.** Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. **No bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof.**

2. Preparation of Bid:

Each bid must be submitted on the prescribed form and accompanied by a bid security as described in paragraph 5. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures, and the foregoing certifications must be fully completed and executed when submitted. In case of discrepancies of written words and figures, the prices written in words shall govern.

Each bid must be submitted in duplicate in a sealed envelope bearing on the outside the name of the bidder, his/her address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

3. Method of Bidding:

The Owner invites unit price/lump sum price bids as indicated in the Bid form. If the lowest total responsive bid received exceeds the amount of funds available to finance the contract, the Owner may:

- a. Reject all bids;
- b. Augment the funds available in an amount sufficient to enable award to the lowest responsive bidder or bidders;
- c. Take the base bid less a number of items as listed on the proposal form as to produce a net amount which is within available funds.

4. Qualifications of Bidder:

All bidders shall have experience in all functions of the work described in the plans for this project.

5. Bid Security:

Each bid shall be accompanied by either a Bid Guaranty Bond in the amount of 100% of the Bid amount or by a certified check, cashier's check, or letter of credit on a solvent bank in the amount of not less than 10% of the amount of the Bid, subject to conditions provided in the Instructions to Bidders. The successful BIDDER will be required to furnish a satisfactory Performance Bond in the amount of 100% of the Bid in accordance with Section 153.54 of the Ohio Revised Code.

Such cash, checks or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within sixty (60) days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he/she has not been notified of the acceptance of his/her bid. Attorneys-in-fact who sign bid bonds must file with each bond a certified and effectively dated copy of their power of attorney.

Bid security furnished in bond form shall be issued by a Surety Company or Corporation licensed in the State of Ohio to provide said surety.

6. Liquidated Damages for Failure to Enter into Contract:

The successful bidder, upon his/her failure or refusal to execute and deliver the contract and bonds required within ten (10) days after he/she has received notice of the acceptance of his/her bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his/her bid.

7. Conditions of Work:

Each bidder must inform himself/herself fully to the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his/her obligation to furnish all material and labor necessary to carry out the provisions of his/her contract. Insofar as possible the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

8. Obligation of Bidder:

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents. This includes any and all addenda. The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his/her bid.

9. Examination of Site:

Each bidder shall and is hereby directed to inspect the entire site of the proposed work and judge for himself/herself as to all the circumstances affecting the cost and progress of the work and shall assume all patent and latent risks in connection therewith. For the benefit of each prospective bidder, **a Pre-bid Conference has been scheduled on Friday June 5th, 2:00 p.m. at the Project Site, 605 Ravenna Road, Streetsboro, Ohio.**

10. Working Facilities:

The plans show, in the general and detailed manner, the existing structures and the land available for construction purposes. The bidders must satisfy themselves of the conditions and difficulties that may be encountered in the execution of the work at this site.

11. Addenda and Interpretations:

No official interpretation of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to **Dustin Doherty, PE, Civil and Environmental Consultants, Inc., via email and contain Trail Lake Park Trailhead and Trail – RFI in the address**; Email: ddoherty@cecinc.com and to be given consideration, **must be received by June 15, 2020 by 4 P.M.** Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the Portage Park District website, **not later than June 18, 2020, 4:00.** Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his/her bid as submitted. All addenda so issued shall become part of the contract documents.

12. Water Supply:

All water for construction purposes, as well as the expense of having water conveyed about the work, must be provided by the Contractor and the cost of this work shall be included in the unit prices stipulated for the various items of the work to be done under this contract.

The source, quality and quantity of water furnished shall, at all times, be satisfactory to the project engineer.

13. Signature of Bidders:

The firm, corporate or individual name of the bidder must be signed in ink in the space provided for the signatures on the proposed blanks. In the case of a corporation, the title of the officer signing must be stated and such officer must be thereunto duly authorized and the seal of said corporation duly affixed. In the case of the partnership, the signature of at least one of the partners must follow the firm name, using the term “member of the firm”. In the case of an individual, use the terms “doing business as”, or “sole owner”. The bidder shall further state in his proposal the name and address of each person or corporation interested therein.

14. Notice of Special Conditions:

Attention of the bidder is particularly called to those parts of the General Contract Conditions and other contract documents and specifications which deal with the following:

- a. Insurance requirements
- b. Requirement for a performance bond for 100% of contract price
- c. Requirement that all subcontractors be approved by the owner
- d. Time-for-completion and liquidated damages requirements
- e. Affirmative Action and Equal Opportunity provisions, including Prevailing Wage requirements

- f. Successful bidder shall provide any proof of registration as may be required within Portage County

15. Additional Obligations Upon Contract Award:

Upon award of the contract but prior to execution of the final agreement and notice to proceed, the contractor shall submit all of the following documents, completed as required:

- a. Acceptance of Notice of Award
- b. Contract
- c. Insurance certificate(s) and/or policy(ies)/Workers Compensation Certificate
- d. Performance Bond, if not already provided
- e. Contractor Registration for prime and subcontractors, if required

16. Foreign Corporations and Contractors

a. Foreign Corporations

Definition: "Foreign Corporation" means a corporation incorporated under the laws of another state. No contract shall be entered into with a foreign corporation until the Secretary of State has certified that such corporation is authorized to do business in Ohio; and until, if the bidder so awarded the contract is a person or partnership, it has filed with the Secretary of State a Power of Attorney designating the Secretary of State as its agent for the purpose of accepting service of summons in any action brought under Section 153.05 of the Ohio Revised Code or under Sections 4123.01 to 4123.94, inclusive of the Revised Code.

17. Signing Bid — Agreement to Terms of Attached Contract:

By signing this bid, Contractor acknowledges reading all attached and all referenced documents and agrees he/she abide by the terms therein, without modification, unless Owner agrees to such modifications in writing. Modifications of any documents attached or referenced herein shall not be made a condition of signing the final contract by the Contractor and failure to sign the contract as worded herein within the time allotted shall subject the Contractor to forfeiture of his/her bid security.

18. Liquidated Damages for Failure to Complete Project by Completion Date

Contractor and Park District recognize that time is of the essence of this Project and that the Park District will suffer financial loss if the work is not completed within the times specified under Completion Date, plus any extensions allowed under the contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by the Park District if the Work is not completed on time. Accordingly, instead of requiring such proof, the Park District and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay the Park District two hundred fifty dollars (\$250.00) for each day that expires after the time specified in the Completion Date until the work is substantially completed. After substantial completion, if Contractor shall neglect, refuse or fail to complete the remaining work within the contract time or any proper extension thereof granted by the Park District, Contractor shall pay Park District two hundred fifty dollars (\$250.00) for each day that expires after the time specified in Completion Date for completion and readiness for final payment until the work is completed and ready for final payment.

19. Applicable Laws

This Contract shall be construed, interpreted, and the rights of the parties determined in accordance with the laws of the State of Ohio and in the Courts of Portage County, Ohio or in the case of Federal Jurisdiction in the United States District Court of Ohio, Northern District, Eastern Division.

All State, Federal and Portage Park District laws, regulations and rules are hereby incorporated into this Contract.

Section 4115.07 of the Ohio Revised Code of the State of Ohio provides that all contractors or subcontractors falling within or affected by Section 4115.03 to 4115.14 inclusive of the Ohio Revised Code, shall keep full and accurate payroll records covering all disbursements of wages to their employees to whom they are required to pay not less than the minimum prevailing rates of wages, as set forth in the Contract. Such payroll records shall not be destroyed or removed from the State for a period of one year following the completion of the Contract in connection with which records are made.

At any time during the life of the Contract, the Park District may demand that the contractor and/or his subcontractors submit an affidavit stating that wages have been paid for the pay period or periods in question in conformance with the minimum rates set forth in the contract. Such affidavits must be supported by a certified copy of his/her detailed payroll records for the questioned period or periods. Said detailed payroll records shall show the individuals by name, classification and pay rate on the contractor's payroll each day of the period, together with the hours each day and the total amount paid, plus any deductions which may have been made. The Park District may withhold partial payments pending the submission of the affidavit and certified payroll records. If minimum wage requirements have not been met in accordance with the terms of the contract, payments may be withheld until the contractor and/or subcontractor has complied.

UPON COMPLETION OF THE WORK AND PRIOR TO FINAL PAYMENT, THE CONTRACTOR and SUBCONTRACTORS (IF ANY) SHALL SUBMIT AN AFFIDAVIT (SEE PREVAILING WAGE RESPONSIBILITIES SECTION) STATING THAT WAGES HAVE BEEN PAID IN CONFORMANCE WITH THE MINIMUM RATE SET FORTH IN THE CONTRACT.

The 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 Park District will release the Surety and/or make final payment due under the terms of the contract.

20. Clerical Error

The Park District reserves the right to correct any award erroneously made as a result of a clerical error on the part of the Portage Park District.

21. Indemnification

Contractor agrees to indemnify, defend and hold harmless the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), employee(s) and agent(s) thereof, from and against any and all liabilities, claims and causes of action or damages which may result from the acts, errors, omissions or misconduct of Contractor or of any of its members, officers, officials, employees or agents within any term of the Agreement and for any period

within the statute of limitations beyond the term of this Agreement. Contractor shall make good any loss, damage or injury resulting from such Contractor conduct so as to avoid any loss to the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), and employee(s).

Any insurance required under this Contract shall name the Portage Park District, the Portage County Board of Commissioners and Portage County government as additional insureds.

If Contractor's bid is accepted, Contractor agrees to enter into Contract in accordance with the bid, plans, details, specifications and other items defined as included in the Contract in Definitions, Article 1. In addition to any other indemnifications in this Contract, Contractor agrees to indemnify the Portage Park District, the Portage County Board of Commissioners and Portage County government against all damage suffered by any Contractor failure to perform the Contract according to its provisions. Contractor agrees to pay all lawful claims of subcontractors, material suppliers and laborers for labor performed or material furnished in carrying forward, performing or completing the Contract. Contractor further agrees and assents that this requirement is for the benefit of any subcontractor, material supplier, or laborer having a just claim, as well as for the Portage Park District, the Portage County Board of Commissioners and Portage County government.

22. Workers' Compensation

Insofar as Worker's Compensation is concerned, the bidder or contractor agrees to furnish an official certificate or receipt of the Industrial Commission of Ohio, showing that he has paid into the State Insurance fund the necessary premiums, whenever such certificates are required in the Advertisement for Bids.

23. Equal Employment Opportunity Policy

During the performance of this Agreement, Contractor agrees that it, nor any subcontractor, nor any person working on the Contractor or sub-contractors behalf shall discriminate, intimidate or retaliate against any employee or applicant for employment who is qualified and able to perform the work required, by reason of race, color, creed, religion, sex, age, disability, national origin, ancestry or military status as defined in section 4112.01 of the Ohio Revised Code. The Contractor shall post in conspicuous places notices to be provided setting forth the provisions of this nondiscrimination clause. The Contractor shall insert the foregoing provisions in any of its sub-contracts pursuant to this Agreement and shall require sub-contractors or others engaged in performance of work on its behalf pursuant to this Agreement to do the same.

24. Insurance

The Contractor shall not commence work under this Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.

The contractor shall file with the Owner all Certificate(s) of Insurance as are necessary to document the insurance coverage required hereunder, subject to the approval of the Owner and receipt of any additional forms/documentation requested, prior to final execution of the Contract and issuance of the Notice to Proceed.

Requirements for all Insurance Coverages

Notices to Owner and Other Additional Insured

The policy shall provide and the Certificate shall reflect the fact the Owner and all other additional insured shall receive at least 30 days notice of any cancellation or change in the coverage (except for nominal changes) adverse to the interests of the Owner and other additional insured in order for such cancellation or change in coverage to be effective. The Owner and other additional insured shall be provided with any notice or non-renewal, regardless of the cause.

Additional Insured

Insurance required in this Contract shall name the Portage Park District, Portage County Board of Commissioners, Portage County government as additional insureds, along with any sub-contractors or other performing work on Contractor's behalf.

Policy Format

All policies shall be the Insurance Service Office's current form or better.

General Liability

Types of Insurance: The policy should provide at a minimum, the following coverages and the Certificate of Insurance shall so indicate whether the coverage is provided in the basic policy or in supplemental coverage to negate an exclusion in the basic policy:

- Comprehensive Form
- Premises/Operations
- Underground, Explosion and Collapse Hazard (Underground and Collapse Hazard coverage required only for General Construction Contractor and others doing excavation and other earthwork)
- Products/Completed Operations
- Contractual
- Independent Contractor
- Broad Form Property Coverage

Liability Limits: The liability limits for the coverages noted above shall be at least as noted below.

	Liability Limits	
	Each Occurrence	Aggregate
BI & PD Combined (CSL)	\$ 1,000,000	\$ 1,000,000

Automobile Liability

Types of Coverage: The policy shall include at least the following types of coverage:

- Any Auto
- All Owner Autos (Priv. Pass.)
- All Owned Autos (Other than Priv. Pass.)
- Hired Autos
- Non-Owned Autos

Liability Limits: The liability limits for the coverages noted above shall be at least as noted below.

Liability Limits

	Each Occurrence	Aggregate
BI & PD Combined	\$ 1,000,000	\$ 1,000,000

Owners Protective Liability Policy: The liability limits for the coverages noted above shall be at least as follows:

	Liability Limits	
	Each Occurrence	Aggregate
BI & PD Combined	\$ 1,000,000	\$ 1,000,000

Builders Risk/Installation Floater

Types of Coverage

The Contractor shall insure for the life of the contract against all loss or damage by fire, flood other than National Flood Insurance (whether in a flood hazard area or not), hurricane, windstorm, hail, lightning, explosion, riot civil commotion, aircraft, smoke, vehicles and other hazards covered by the standard current I.S.O. standard fire and extended coverage insurance endorsement. Coverage shall also be provided for all materials and equipment for which pre-incorporation payment is requested.

Limits of Liability: The limit of liability for the coverage noted above shall be not less than the amount of the Contract.

Contractor's Insurance Agent E/O Certificate

Contractor's insurance agent shall provide the Park District with Agent's Errors and Omissions Certificate in the minimum amount of One Million Dollars (\$ 1,000,000.00)

The Policies as listed above shall contain all the following special provisions:

The Company agrees that thirty (30) days prior to cancellation or reduction of the insurance afforded by this policy with respect to the Contract involved, written notice will be mailed to the Portage Park District.

The maintaining of such insurance as outlined herein shall in no way constitute a waiver of legal liability for damage to any adjoining buildings or their contents or the work and property of others on the site beyond the limits of insurance thus maintained. The Contractor shall hold the Owner free and harmless from any injury and damage resulting from the negligent or faulty performance of the contract by the Contractor or by his/her Subcontractors.

Each contractor shall hold the Owner harmless from all payments for patents, either as royalty or otherwise, in the use of materials, methods, appliances, etc., that he may be in any way involved in or connected with any part of his work or the work of his Subcontractors.

Upon contract award, the contractor shall furnish one (1) copy of Declaration of Insurance as evidence of coverage.



Trail Lake Park-Trailhead and Trails

To: All Bidding Contractors
From: Christine Craycroft, Executive Director
Re: Submittal Requirements
Date: May 28, 2020

Dear Interested Bidders:

The bid specifications require you to submit the items listed below. The omission of any item called for by the bid document does not relieve you of the responsibility to comply with the requirement. Please review your specifications. This list is for your convenience only. If you do not have the listed items submitted, your bid may not be considered.

Please submit:

- Bidder's Proposal
- Proposed Construction Schedule-provided by bidder
- Delinquent Tax Affidavit
- Certificate in Compliance with Section 3517.13
- Non-Collusion Affidavit
- Income Tax Affidavit
- Certification Against Debarment and Suspension
- Unresolved Finding for Recovery Certification
- Bid Guaranty & Bond
- Statement of Bidder's Qualifications & Affidavit
- Proposed Subcontractors' Breakdown

GENERAL PROVISIONS

GENERAL PROVISIONS

ARTICLE 1 - DEFINITIONS

Whenever the words defined in this article, or pronouns used in their stead, occur in the Contract Documents, they shall have the meanings given herein.

Owner: The Portage Park District or their designated representative or any officer duly authorized to act for said agency.

Architect/ Engineer: The Project Manager/ Architect/ Engineer so designated by the Portage Park District assigned to administer the contract.

Inspector: An authorized representative of the Project Manager/Architect/Engineer assigned to make any and all necessary inspections of the work performed and materials furnished by the Contractor.

Contractor: The party entering into the Contract for the performance of the work required thereby, the legal representative of said party, or the agent appointed to act for said party in performance of the work.

Subcontractor: An individual, firm, or corporation who contracts with the Contractor to perform part or all of the latter's contract.

Surety: The body corporate which is bound with and for the Contractor on the bond furnished in connection with this project, which bond forms a part of the Contract Documents.

Specifications: The definitions, instructions, descriptions, directions, provisions, and requirements contained herein and all written supplements thereof made, or to be made, pertaining to the Contract and the materials and workmanship to be furnished under the Contract.

Contract: All things contained in the specifications, drawings, proposal, agreement, and bond; also, all supplemental agreements which could reasonably be required to complete the construction contemplated. The above items shall be considered as one instrument forming the Contract. It is understood that all things contained or referred to in the Advertisement, Information to Bidders, Special Provisions, General Provisions, Detailed Specifications, Signed Contract, Contract Bond, and Drawings, as well as all other papers or addenda attached to or bound with any of the above or referred to therein, are part of the Contract and are to be considered as one instrument constituting the Contract Documents. The intent is to make the various "Parts" and "Sections" of the Contract Documents complementary one to the other. No papers attached to or bound with any of the above shall be detached thereto, as all are a necessary part thereof. Whenever in the Specifications or in the Drawings the words directed, permitted, ordered, designated, prescribed or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation or prescription of the Engineer is intended.

ARTICLE 2 - CONTRACT AND CONTRACT DOCUMENTS

All applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

The specifications and addenda, shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

ARTICLE 3 - PERFORMANCE BOND

Simultaneously with his/her delivery of the executed contract, the Contractor shall furnish a surety bond as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner. The bond shall be for 100 percent of the contract price. A Performance Bond meeting the requirements of O.R.C. 153.54 is required. Attorneys-in-Fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

ARTICLE 4 - ANTIDISCRIMINATION

During the performance of this Agreement, Contractor agrees that it, nor any subcontractor, nor any person working on the Contractor or sub-contractors behalf shall discriminate, intimidate or retaliate against any employee or applicant for employment who is qualified and able to perform the work required, by reason of race, color, creed, religion, sex, age, disability, national origin, ancestry or military status as defined in section 4112.01 of the Ohio Revised Code. The Contractor shall post in conspicuous places notices to be provided setting forth the provisions of this nondiscrimination clause. The Contractor shall insert the foregoing provisions in any of its sub-contracts pursuant to this Agreement and shall require sub-contractors or others engaged in performance of work on its behalf pursuant to this Agreement to do the same.

ARTICLE 5 - AUTHORITY OF PROJECT MANAGER/ARCHITECT/ENGINEER

The Architect/Engineer shall give all orders and directions contemplated under this Contract; shall determine in all cases the amount, quality, acceptability, and fitness of the several kinds of work and materials for which payment is to be made; shall determine all questions respecting the true interpretation or meaning of the Drawings or Specifications relating to said work and the construction thereof; shall decide in all cases every question which may arise relative to the fulfillment of this Contract on the part of the Contractor. In case any dispute shall arise between the parties hereto involving this Contract, seeking determinations and decisions of the Project Manager/Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money under this Contract.

ARTICLE 6 - AUTHORITY AND DUTIES OF INSPECTORS

Inspectors employed under the supervision of the Project Manager/Architect/Engineer shall be authorized to inspect all work done and materials furnished. Inspection may extend to any part of the work and of the preparation or manufacture of the materials to be used. Inspectors will be assigned to the various phases of the work, reporting to the Project Manager/Architect/Engineer as to the progress of the work and the manner in which it is being performed; also reporting whenever it appears that the materials furnished and work done by the Contractor fail to fulfill the requirements of the Specifications and Drawings, and to call to the attention of the Contractor any failure or other default; but, no inspection, nor any failure to inspect at any time or place, shall relieve the Contractor from any obligation to perform all the work strictly in accordance with the requirements of the Specifications. In case of any dispute arising between the Contractor and the inspector as to materials furnished or the manner of performing the work, the inspector shall have the authority to reject materials or suspend work until the question at issue can be referred to and decided by the Project Manager/Architect/Engineer. The inspectors shall perform such other duties as are assigned to them. They shall not be authorized to revoke, alter, enlarge, relax, or replace any requirements of these Specifications, nor to approve or accept any portion of the work, nor to issue instructions contrary to the Drawings and Specifications. Inspectors shall in no case act as foremen or perform other duties for the Contractor, nor interfere with the management of the work. Any instructions which the inspectors may give the Contractor shall in no way be construed as committing the Project Manager/Architect/Engineer, or the Owner, in any way, nor releasing the Contractor from fulfillment of the terms of the Contract.

ARTICLE 7 - SUPERVISION

The Contractor will supervise and direct the work. He/She will be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor will employ and maintain on the work site a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present and on the site at all times as required to perform adequate supervision and coordination of work.

The Owner and its representatives will, at all times, have access to the work. In addition, authorized representatives and agents of any participating federal or state agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the work and also for any inspection or testing thereof.

The Contractor shall submit a proposed program of operation, showing clearly how he/she proposes to conduct the work so as to bring about the completion of his/her work within the time limit specified. This program shall outline the proposed sequence of operations, the rates of progress and the dates when his/her work will be sufficiently advanced to permit the installation of the work under other contracts, and the estimated progress payments due under the Contract. The work under this contract shall be so scheduled that as structures are completed, they can be placed into useful operation with a minimum of delay. The program shall be subject to the approval of the Owner.

All construction as proposed along all City, Township, State and Federal rights of way including storage and stockpiling of materials, is to be conducted within the limits of the public right-of-way. Bracing, sheeting, and shoring shall be used to keep all construction work within the construction limits unless

work agreements are secured from the adjacent property owners. It is the Contractor's responsibility to secure these work agreements, if deemed necessary. Copies of the work agreements shall be delivered to the Project Manager/Architect/Engineer and the Owner prior to any work beginning on the affected property.

ARTICLE 8 - EQUIPMENT

The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools, and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Project Manager/Architect/Engineer and shall be maintained in a satisfactory working condition. Equipment used on all portions of the work shall be such that no injury to work, adjacent property, or other objects will result from its use. The contract may be annulled if the Contractor fails to provide adequate equipment for the work.

ARTICLE 9 - SAFETY

The Contractor will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work. He/She will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury, or loss to all employees of the work and other persons who may be affected thereby, and all the work and all materials or equipment to be incorporated therein, whether in storage on and off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor will erect and maintain, as required by the conditions and progress of the work, all necessary safeguards for safety protection. He/She will notify owners of adjacent utilities when prosecution of the work may affect them.

The Contractor shall comply with the safety standards provisions of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-586), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No. 75, Saturday, April 17, 1971. The Contractor shall also comply with Chapter 4104.9-2 of the Ohio Revised Code prohibiting the Employment of Minors in Occupations Hazardous or Detrimental to their Health.

The Contractor shall maintain at his/her office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured at the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

Lights, signs, and barricades shall be used to maintain traffic and safety for vehicular and pedestrian traffic during the course of this contract in accordance with the specifications.

ARTICLE 10 - INDEMNIFICATION

Contractor agrees to indemnify, defend and hold harmless the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), employee(s) and agent(s) thereof, from and against any and all liabilities, claims and causes of action or damages which may result from the acts, errors, omissions or misconduct of Contractor or of any of its members, officers, officials, employees or agents within any term of the Agreement and for any period within the statute of limitations beyond the term of this Agreement. Contractor shall make good any loss, damage or injury resulting from such Contractor conduct so as to avoid any loss to the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), and employee(s).

Any insurance required under this Contract shall name the Portage Park District, the Portage County Board of Commissioners and Portage County government as additional insureds.

If Contractor's bid is accepted, Contractor agrees to enter into Contract in accordance with the bid, plans, details, specifications and other items defined as included in the Contract in Definitions, Article 1. In addition to any other indemnifications in this Contract, Contractor agrees to indemnify the Portage Park District, the Portage County Board of Commissioners and Portage County government against all damage suffered by any Contractor failure to perform the Contract according to its provisions. Contractor agrees to pay all lawful claims of subcontractors, material suppliers and laborers for labor performed or material furnished in carrying forward, performing or completing the Contract. Contractor further agrees and assents that this requirement is for the benefit of any subcontractor, material supplier, or laborer having a just claim, as well as for the Portage Park District, the Portage County Board of Commissioners and Portage County government.

ARTICLE 11 - CONSTRUCTION SCHEDULE

The date of beginning and the time for completion of the work are essential conditions of the Contract Documents. Bidders shall submit a proposed construction schedule with the bid, with the understanding that the project shall be completed by December 15, 2020, and once work commences it shall be continuous until complete. The Owner and Contractor shall mutually agree on a commencement date to be specified in the Notice to Proceed. It is intended the Notice to Proceed shall be issued

The Contractor will proceed with the work at such rate of progress as to ensure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the Contract Time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work. The contract time to fully complete the project shall be from the date of the "Notice to Proceed" to the Substantial Completion date of December 15, 2020.

If the Contractor shall fail to complete the work within the Contract Time, or extension of time granted by the Owner, the Contractor will pay to the Owner for liquidated damages \$250.00 for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

ARTICLE 12 - COMPLETION OF WORK

The Contractor shall guarantee all materials and equipment furnished for a period of one year from the

date of Substantial Completion. The Contractor warrants and guarantees for a period of one year from the date of Substantial Completion of the improvement that it is free from all defects due to faulty materials or workmanship, and the Contractor shall promptly make corrections as may be necessary by reason of such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make repairs, adjustments, or other work which may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

When the work, including that performed by Subcontractors, is completed, the site shall be cleaned of all rubbish and debris caused by the construction and all privately owned property shall be returned to its original condition. All sheds or other temporary structures, surplus materials, and equipment shall be removed and the project left in a neat and presentable condition.

ARTICLE 13 - LAWS AND REGULATIONS

The Contractor shall keep himself fully informed of all Federal and State Laws in any way affecting those engaged or employed in the work, the material used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or political subdivisions having any jurisdiction or authority over the same. If any discrepancy or inconsistency shall be discovered in this Contract or in the Drawings and Specifications herein referred to in relation to any such law, regulation, decree, or order, the Contractor shall forthwith report the same in writing to the Engineer. He/She shall at all times himself observe and comply with, and shall cause all of his/her agents and employees to observe and comply with, all such existing and future laws, regulations, orders and decrees; and shall protect and indemnify the Park District, its officers and agents against any claims or liability arising from or based on the violation of such law, regulation, order or decree whether by himself or by his employees.

Contractor shall fully comply, and ensure that those working on its behalf pursuant to this Contract, comply with all Federal, State and Local laws, rules, regulations and other requirements. Contractor shall indemnify, defend and hold harmless the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), employee(s) or agent(s) thereof from any and all liability resulting from any Contractor failure to so comply. Contractor shall likewise indemnify, defend and hold harmless the Portage Park District, the Portage County Board of Commissioners, Portage County government and any member(s), officer(s), official(s), employee(s) or agent(s) from any failure to so comply by those working on behalf of Contractor.

ARTICLE 14 - SUBCONTRACTS

The Contractor shall not sublet, sell, transfer or assign any portion of the contract without written consent of the Owner or the Owner's designated agent. When such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with his/her own organization, work amounting to no less than fifty percent of the total contract cost, except any item designated in the contract before computing the amount of work required to be performed by the Contractor with his/her own organization. No subcontract, or transfer of contract, shall in any way release the Contractor or his/her liability under the contract and bonds.

The Contractor shall not award work to subcontractor(s) without prior written approval of the Owner and after submission of all certifications as required in the Instructions to Bidders. The Contractor shall be fully responsible to the Owner for the acts and omissions of the subcontractor(s), and of persons

either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

ARTICLE 15 - ASSIGNMENT

The Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract or his right, title, or interest in or to the same or any part thereof, without the previous consent in writing of the Owner endorsed herein or hereby attached; and he shall not convey by power of Attorney or otherwise, any of the moneys to become due and payable under this Contract unless, by and with, like consent signified in a like manner. If the Contractor shall, without previous written consent, assign, transfer, convey, sublet or otherwise dispose of his/her Contract or his/her right, title or interest therein or any moneys to become due under this Contract to any person, firm or corporation, this Contract may, at the option of the Owner, be revoked and annulled and the Owner shall thereupon be relieved and discharged from any and all liabilities and obligations growing out of the same to the Contractor and to his/her assignee or transferee; provided that nothing herein contained shall be construed to hinder, prevent, or affect an assignment by the Contractor for the benefit of his/her creditors, made pursuant to the statutes of the State of Ohio; and no right under this Contract, or to any moneys to become due hereunder, shall be asserted against the Board in law or equity, by reason of any so-called assignment of this Contract, or any part thereof, or any moneys become due hereafter unless authorized by written consent of the Owner.

ARTICLE 16 - CHANGE OF WORK

The Owner reserves the right to make, at any time during the progress of the work, such increases or decreases in quantities and such alterations in details of work as may be deemed necessary or desirable. Such increases or decreases and alterations shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered, the same as if it had been a part of the original contract.

Authorized alterations in plans or quantities of work involving work not covered by unit prices in the proposal shall be paid for as stipulated in the change order authorizing such work.

No changes in work covered by the approved Contract shall be made without having prior written approval of the Owner.

ARTICLE 17 - ESTIMATED QUANTITIES

The quantities of the various classes of work to be done and materials to be furnished under this Contract, which have been estimated as stated in the Advertisement of the Bid, are approximate and only for the purpose of comparing, on a uniform basis, the bids offered for the work under this Contract. Neither the Owner, nor any of its officers or agents thereof, are held responsible because any of the said estimated quantities shall be found to be greater or less on the completion of work. The Contractor shall make no claim for anticipated profits or for loss of profits because of a difference between the quantities as established for the final estimate and the various estimated quantities stated in the Proposal.

ARTICLE 18 - PARTIAL ESTIMATES

Each month the Engineer will make in writing an estimate of the amount and value of the work and the materials incorporated in the work by the Contractor in the performance of this Contract. The Contractor shall aid the Engineer in the preparation of this estimate by submitting to him at the start of each month an estimate of the work he has accomplished during the preceding month, broken down by items and containing supporting computations. The first such estimate shall be of the amount and value of the work done and the materials incorporated in the work since the Contractor commenced the performance of the Contract. Every subsequent estimate, except the final estimate, shall be of the amount and value of the work done and materials incorporated in the work since the last preceding estimate was made; provided, however, that no such estimate shall be required to be made when, in the judgment of the Project Manager/Architect/Engineer, the total value of the work done and material incorporated in the work since the last preceding estimate amounts to less than two thousand dollars. At the discretion of the Project Manager/Architect/Engineer allowances may be made for non-perishable materials which are to be incorporated in the work, when delivered and properly stored upon the site. Payment for materials and equipment delivered and stored as specified above shall be based upon certified paid invoices to be submitted by the Contractor and title to the same shall be vested with the Owner upon payment therefore. The Contractor's plant shall not be included in partial estimates, such estimates shall not be required to be made by strict measurement, but they may be made by measurement or by estimation, or partly by one method and partly by the other, and it shall be sufficient if they are approximate only. Such estimates shall be dated as of the last day of the month covered by the estimate, except the final estimate.

ARTICLE 19 - PARTIAL PAYMENTS

Before the contract is fifty percent completed, labor performed on the project and materials delivered on site shall be paid for at a rate of ninety-two percent of the estimates for partial payment as submitted by the Contractor, checked and prepared by the Project Manager/Architect/Engineer, and approved by the Project Manager/Architect/Engineer.

ARTICLE 20 - ADJUSTMENT OF RETAINED PERCENTAGES

After the Contract is more than fifty percent completed, labor performed shall be paid for at the rate of one hundred percent of the estimates submitted by the Contractor, checked and approved by the Project Manager/Architect/Engineer.

All materials delivered on the site after the Contract is fifty percent completed shall be paid for at a rate of ninety-two percent of the invoiced value of the material. The balance of such estimate shall be paid when the material is incorporated into and becomes a part of the project.

The Contract shall be fifty percent completed when the Contractor has been paid an amount equal to fifty percent of the total cost of the labor of the Contract and fifty percent of the total cost of the material of the Contract.

ARTICLE 21 - PARTIAL PAYMENT MAY BE WITHHELD

Partial payments may at any time be withheld or reduced if, in the opinion of the Project Manager/Architect/Engineer, the work is not proceeding in accordance with this Contract.

ARTICLE 22 - FINAL ESTIMATE

When, in the opinion of the Project Manager/Architect/Engineer, all the work contemplated by this Contract is completed, he shall measure up said work and prepare a final estimate of the same. The Contractor shall aid the Project Manager/Architect/Engineer in the preparation of this estimate by submitting to him, as soon as possible following the completion of work an estimate of the work he has done under this Contract, broken down by items and containing supporting computations. The Owner shall, within thirty days after receiving the said final estimate, make payment of ninety-six percent of the amount of said estimate, less previous payments to the Contractor and such other sums as may lawfully be retained under the terms of this Contract, provided that all terms of this Contract have been complied with by said Contractor. Such estimate shall be dated as of the day on which the Contractor shall have completed the work called for to be done under this Contract.

ARTICLE 23 - FOUR PERCENT RESERVE

The said Contractor hereby further agrees that the Owner shall be, and is hereby authorized to retain for a period of thirty days subsequent to the date of the final acceptance of work, out of the money payable to said Contractor under this agreement, the sum of four percent of the amount of the Contract, and to expend the same in making such repairs of the said work for which the Contractor is responsible as the Project Manager/Architect/Engineer may deem necessary in case such repairs are neglected by the Contractor after reasonable notice.

ARTICLE 24 - REPAIRS FOR ONE YEAR

The Contractor shall make all repairs due to defective workmanship of material for the term of one year after the date of the final estimate; shall correct and repair promptly during that time all defective work and material of whatever description; and shall deliver the work in all respects in good condition at the end of that time. However, ordinary wear and tear, or damage due to negligent or improper operation on the part of the Owner, shall not be considered an obligation of the Contractor. Twelve months after the date of the final estimate, as hereinbefore mentioned, and as soon after the expiration of the said twelve months as practicable, the Owner shall make or cause to be made a final inspection of the performance of this Contract.

If such performance and work shall be found satisfactory and not to have deteriorated through defects of workmanship or material, then the Owner shall accept said work. Such acceptance shall be a prerequisite to the release of the surety on the warranty bond. If, however, the final or any prior inspection discloses defects due to non-fulfillment of this Contract, or non-compliance with its requirements, the Owner shall so notify the Contractor in writing and thereupon the Contractor shall, at his/her own expense, repair or replace and shall make good all defects of materials, workmanship, or guarantee. Such repairs shall be a prerequisite to the approval and acceptance of the work and the release of the surety on the warranty bond. In case the Contractor shall neglect or fail to promptly make said repairs, after written notification, the Owner shall cause such repairs to be made at the expense of the Contractor.

ARTICLE 25 - FINAL PAYMENT

The Owner agrees that upon the expiration of said period of thirty (30) days, provided all the work shall at that time be in good order and approved by the Owner following the final inspection, the said Contractor shall be entitled to receive the whole or that part of the above mentioned sum as may remain after the expense of making such repairs shall have been paid thereto. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

The Owner hereby agrees to pay and the Contractor hereby further agrees to receive in full compensation for furnishing all materials and doing all work as contemplated and set forth by these Specifications and the accompanying drawings, the several sums and prices set forth in the proposal sheet hereto attached.

ARTICLE 26 - LIENS

If, at any time within thirty (30) days after the whole work herein agreed to be performed and all labor and material herein agreed to be delivered have been performed and delivered or completed and accepted by the Owner, any person or persons claiming to have performed any labor or furnishing any materials toward the performance or completion of this Contract shall file with the Owner notice according to law, the Owner shall retain until the discharge thereof, from all money under its control, such moneys as shall be sufficient to satisfy and discharge the amount in such notice claimed to be due, together with the costs of any action or actions brought to enforce such lien created by the filing of such notice.

ARTICLE 27 - TERMINATION

After ten (10) days from delivery of a written Notice to the Contractor, the Owner may, without cause and without prejudice to any other right or remedy elect to terminate the Contract. In such case the Contractor shall be paid for all work executed and any expense sustained. Contractor shall also be entitled to reasonable profit, unless such termination was due to the act or conduct of the Contractor.

SPECIAL PROVISIONS

SPECIAL PROVISIONS

ARTICLE 1. Physical Data

The Contractor shall make all explorations necessary to locate structures to which connections are to be made without extra expense to the Owner.

ARTICLE 2. Night Work

No work shall be done during the hours between sunset and sunrise without the prior approval or order of the Project Manager/Architect/Engineer.

ARTICLE 3. Work on Sunday and Holidays

No work will be permitted on Sundays or on legal holidays except upon the specific authorization or direction of the Project Manager/Architect/Engineer (to be authorized only in case of extreme emergency).

ARTICLE 4. Protection of Existing Structures

The Contractor shall make such investigations as are necessary to determine the extent to which existing structures may interfere with the prosecution of the work contemplated under this Contract.

Any existing surface, subsurface or overhead structures damaged or destroyed shall be promptly repaired or replaced by the Contractor in a satisfactory manner at his own cost and expense.

ARTICLE 5. Care and Protection of Work

From the commencement of the work until the completion thereof, the Contractor shall be solely responsible for the work covered by this Contract and for all materials and equipment used or intended to be used in the work. All destruction, injury or damage to the same from whatever cause, as well as any damage done by him, his employees, and his subcontractors in the performance of this work shall be made good by him at his own expense before the final estimate is made. He shall provide suitable means of protection for all materials and equipment intended to be used in the work and for all work in progress as well as for the completed work.

ARTICLE 6. Cleaning Up

The Contractor shall keep the site of the work free from trash, litter and waste materials and shall maintain the same in a neat and orderly condition throughout the period of work.

ARTICLE 7. Examination of Finished Work

The Contractor shall furnish the Project Manager/Architect/Engineer with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the Specifications and Contract. If the Project Manager/Architect/Engineer requires it, at any time before

acceptance of the work, the Contractor shall remove or uncover such portion of the finished work as may be directed for examination. The Contractor shall restore said portion of the work to the standards required by the Specifications. Should the work thus exposed or examined above prove acceptable, the uncovering, removing, replacing of the covering, or making good of the parts removed shall be paid for by the Owner; except that any work done or materials used without suitable supervision or inspection by a representative of the Project Manager/Architect/Engineer may be ordered removed and replaced at the Contractor's expense. However, should the work exposed or examined prove unacceptable, either in whole or part, the uncovering, removing, replacing of the covering and making good of the parts removed shall be at the Contractor's expense.

The Contractor shall, when directed, remove all water which may accumulate in or about the work during construction, or prior to the final acceptance of the same, in order that proper inspection may be made.

ARTICLE 8. Safety Precautions

Precautions shall be exercised at all times for the protection of persons (including employees) and property. The safety provisions of applicable laws, and building and construction codes shall be observed.

ARTICLE 9. First Aid

The Contractor shall provide and keep upon the work site a completely equipped first-aid kit and shall provide ready access thereto at all times when men are employed on the work. He shall designate some proper person to be in charge of the first-aid work site and shall cause such person to receive proper instruction therein.

ARTICLE 10. Posting Wage Rates

The Contractor shall post at conspicuous points at the site of the project a schedule showing all determined wage rates.

ARTICLE 11. Wage Rates

In the event that the rate of wages paid for any trade or occupant in the locality where such work is being performed are under current collective agreements or understandings between bona fide organizations of labor and employer, then the wage to be paid shall be not less than such agreed wage rates, nor less than the minimum rates compiled by the Ohio Department of Commerce, Bureau of Labor and Worker Safety

Every Contractor and Subcontractor who is subject to this contract shall, as soon as he/she begins performance under his/her contract with the Owner, supply the Owner a schedule of dates of which he/she is required to pay wages to employees. He/She shall also deliver to the prevailing wage coordinator within three weeks after every pay date, a certified copy of his/her payroll which shall exhibit for each employee paid any wages, name, current address, social security number, number of hours worked each day on the pay period and the total for each week, hourly rate of pay, job classification, fringe benefits, and deductions from wages. The certification of each payroll shall be executed by the Contractor, Subcontractor, or duly appointed agent thereof and shall recite that the payroll is correct and complete and that the wage rate shown is not less than those required by the contract.

ARTICLE 12. Insurance

Requirements for all Insurance Coverages

Notices to Owner and Other Additional Insured

The policy shall provide and the Certificate shall reflect the fact the Owner and all other additional insured shall receive at least 30 days notice of any cancellation or change in the coverage (except for nominal changes) adverse to the interests of the Owner and other additional insured in order for such cancellation or change in coverage to be effective. The Owner and other additional insured shall be provided with any notice or non-renewal, regardless of the cause.

Additional Insured

The insurance required by this Section shall include the interests of the Contractor and its subcontractors, the Engineer and its subconsultants in the work, including each of their respective employees, all of whom shall be listed as insured or as additional insured. The Owner's financing agency shall also be listed as an additional insured, as necessary.

Policy Format

All policies shall be the Insurance Service Office's current form or better.

General Liability

Types of Insurance: The policy should provide at a minimum, the following coverages and the Certificate of Insurance shall so indicate whether the coverage is provided in the basic policy or in supplemental coverage to negate an exclusion in the basic policy:

- Comprehensive Form
- Premises/Operations
- Underground, Explosion and Collapse Hazard (Underground and Collapse Hazard coverage required only for General Construction Contractor and others doing excavation and other earthwork)
- Products/Completed Operations
- Contractual
- Independent Contractor
- Broad Form Property Coverage

Liability Limits: The liability limits for the coverages noted above shall be at least as noted below.

	Liability Limits	
	Each Occurrence	Aggregate
BI & PD Combined (CSL)	\$ 1,000,000	\$ 1,000,000

Automobile Liability

Types of Coverage: The policy shall include at least the following types of coverage:

- Any Auto
- All Owner Autos (Priv. Pass.)
- All Owned Autos (Other than Priv. Pass.)

- Hired Autos
- Non-Owned Autos

Liability Limits: The liability limits for the coverages noted above shall be at least as noted below.

	Liability Limits	
	Each Occurrence	Aggregate
BI & PD Combined	\$ 1,000,000	\$ 1,000,000

Owners Protective Liability Policy: The liability limits for the coverages noted above shall be at least as follows:

	Liability Limits	
	Each Occurrence	Aggregate
BI & PD Combined	\$ 1,000,000	\$ 1,000,000

Builders Risk/Installation Floater

Types of Coverage

The Contractor shall insure for the life of the contract against all loss or damage by fire, flood other than National Flood Insurance (whether in a flood hazard area or not), hurricane, windstorm, hail, lightning, explosion, riot civil commotion, aircraft, smoke, vehicles and other hazards covered by the standard current I.S.O. standard fire and extended coverage insurance endorsement. Coverage shall also be provided for all materials and equipment for which pre-incorporation payment is requested.

Limits of Liability: The limit of liability for the coverage noted above shall be not less than the amount of the Contract.

Contractor's Insurance Agent E/O Certificate

Contractor's insurance agent shall provide the Park District with Agent's Errors and Omissions Certificate in the minimum amount of One Million Dollars (\$ 1,000,000.00)

Article 13. Prompt Payment

In accordance with Section 4113.61 of the Ohio Revised Code, the prime Contractor shall make payment to each subcontractor and materialman within ten (10) calendar days after receipt of payment from the OWNER if Direct Pay for work performed or materials delivered or incorporated into the public improvement, provided that the pay estimate prepared by the Project Manager/Architect/Engineer includes work performed or materials delivered or incorporated into the public improvement by the subcontractor or materialman.

The prime Contractor shall also require that this contractual obligation be placed in all subcontractor and materialman contracts that it enters into and further require that all subcontractors and materialmen place the same payment obligations in each of their lower tier contracts. If the prime Contractor, subcontractors or materialmen subject to this provision fail to comply with the ten (10) day payment requirement, the offending party shall pay, in addition to the payment due, interest in the amount of eighteen percent (18%) per annum of the payment due, beginning on the eleventh (11th) day following the receipt of payment from the OWNER and ending on the date of full payment of the payment due plus interest.

Repeated failures to pay subcontractors and materialmen timely as defined by this statute shall result in a finding that the prime is in breach of contract and subject to all legal consequences that such a finding entails. Further, repeated failures to pay timely as defined by the statute shall result in a lower evaluation score for the prime Contractor and those subcontractors who are subject to evaluation.

Article 14. Ohio Workers' Compensation Coverage

The Contractor shall secure and maintain valid Ohio Worker's Compensation Coverage until final acceptance of the project by the OWNER. If the Contractor is a foreign corporation (incorporated under the laws of another state), then the Contractor shall have coverage in another state that provides reciprocal coverage in the State of Ohio or the foreign corporation shall maintain coverage through the Ohio Bureau of Worker's Compensation. A certificate of coverage evidencing valid worker's compensation coverage shall be submitted to the OWNER before the contract shall be executed.

The Contractor must immediately notify the OWNER in writing if it or any subcontractor fails or refuses to renew their workers' compensation coverage. Furthermore, the Contractor must notify the OWNER in writing if its or any of its subcontractor's workers' compensation policies are canceled, terminated or lapse.

The failure to maintain valid workers' compensation coverage shall be considered a breach of contract which may result in the Contractor or subcontractor being removed from the project, withholding of pay estimates and/or termination of the contract.

Article 15. Unresolved Finding For Recovery

Contractor affirmatively represents to the OWNER that it is not subject to a finding for recovery under R.C. 9.24, or that it has taken the appropriate remedial steps required under R.C. 9.24 or otherwise qualifies under that section. Contractor agrees that if this representation is deemed to be false, the contract shall be void ab initio as between the parties to this contract, and any funds paid by the state hereunder shall be immediately repaid to the state, or an action for recovery may be immediately commenced by the state for recovery of said funds.

Article 16. Drug-Free Workplace Compliance

The prime Contractor agrees to comply with all applicable state and federal laws regarding drug-free workplace. The prime Contractor shall make a good faith effort to ensure that all its employees, while working on the Project, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.

The prime Contractor shall also require that this contractual obligation be placed in all subcontractor and materialman contracts that it enters into and further requires that all subcontractors and materialmen place the same contractual obligations in each of their lower tier contracts.

Article 17. Certification Against Debarment And Suspension

The bidder hereby certifies, except as noted below, under penalty of perjury and under other such penalties as the laws of this state and the United States of America provide, that the company or any person associated there with in the capacity of owner, partner, director, officer, principal investigator,

project director, manager, auditor, or any position involving the administration of federal funds is **not** currently under suspension, debarment, voluntary exclusion or determination of ineligibility by any federal agency; that the company or any person associated therewith in the capacity of owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the administration of federal funds has **not** been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past three (3) years; that the company or any person associated therewith in the capacity of owner, partner, director, manager, auditor, or any position involving the administration of federal funds does **not** have a proposed debarment pending; that the company or any person associated there with in the capacity of owner, partner, director, officer, principal investigator has **not** been indicted, convicted, or had a civil judgment rendered against the company, or themselves by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.

If there are exceptions to any of the above clauses please set out the exceptions on the lines below. Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, initiating agency and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

Execution of this proposal on the signature portion thereof shall constitute also signature of this certification as permitted by Title 28 United States Code, Section 1746.

PREVAILING WAGE CONTRACTOR RESPONSIBILITIES

Wages and Hours on Public Works (Prevailing Wage)

[ORC Chapter 4115: Wages And Hours On Public Works \(Prevailing Wage\)](#)

General Information

Ohio's prevailing wage laws apply to all public improvements financed in whole or in part by public funds. This applies when the total overall project cost is fairly estimated, as of January 1, 2020, for New Building Construction to be at least \$250,000, or New construction involving roads....and other works connected to road or bridge construction at \$93,292.

Thresholds are to be adjusted biennially (every 2 years) by the Director of the Ohio Department of Commerce.

Penalties For Violation

Violators are to be assessed the wages owed, plus a penalty of 100% of the wages owed.

Intentional Violations

If an intentional violation is determined to have occurred, the contractor is prohibited from contracting directly or indirectly with any public authority for the construction of a public improvement. Intentional violation means "a willful, knowing, or deliberate disregard for any provision" of the prevailing wage law and includes but is not limited to the following actions:

- a. Intentional failure to submit payroll reports as required, or knowingly submitting false or erroneous reports.
- b. Intentional misclassification of employees for the purpose of reducing wages.
- c. Intentional misclassification of employees as independent contractors or as apprentices.
- d. Intentional failure to pay the prevailing wage.
- e. Intentional failure to comply with the allowable ratio of apprentices to skilled workers as required by the regulations established by Ohio Department of Commerce, Wage and Hour Bureau.
- f. Intentionally employing an officer, of a contractor or subcontractor, that is known to be prohibited from contracting, directly or indirectly, with a public authority.

Responsibilities

- A. Pay the prevailing rate of wages as shown in the wage rate schedules issued by the Ohio Department of Commerce, Wage and Hour Bureau, for the classification of work being performed. (Website: <http://com.ohio.gov/laws/>)
 1. Wage rate schedules include all modifications, corrections, escalations, or reductions to wage rates issued for the project
 2. Overtime must be paid at time and one-half the employee's base hourly rate. Fringe benefits are paid at straight time rate for all hours including overtime.
 3. Prevailing wages must be paid in full without any deduction for food, lodging, transportation,

use of tools, etc. unless, the employee has voluntarily consented to these deductions in writing. The public authority and the Chief of Wage and Hour Bureau must approve these deductions as fair and reasonable. Consent and approval must be obtained before starting the project.

- B. Use of Apprentices and Helpers cannot exceed the ratios permitted in the wage rate schedules.
 - 1. Apprentices must be registered with the Ohio State Apprenticeship Council.
 - 2. Contractors must provide the Prevailing Wage Coordinator a copy of the Apprenticeship Certification for each apprentice on the project.
- C. Keep full and accurate payroll records available for inspection by any authorized representative of the Ohio Bureau of Wage and Hour or the contracting public authority, including the Prevailing Wage Coordinator. Records should include but are not limited to:
 - 1. Time cards, time sheets, daily work records, etc.
 - 2. Payroll ledger\journals and canceled checks\check register.
 - 3. Fringe benefit records must include program name, address, account number, and canceled checks.
 - 4. Records made in connection with the public improvement must not be removed from the State for one (1) year following the completion of the project.
 - 5. Out-of-State Corporations must submit to the Ohio Secretary of State the full name and address of their Statutory Agent in Ohio.
- D. Prevailing Wage Rate Schedule must be posted on the job site where it is accessible to all employees.
- E. Prior to submitting the initial payroll report, supply the Prevailing Wage Coordinator with your project dates to schedule reporting of your payrolls.
- F. Supply the Prevailing Wage Coordinator a list of all subcontractors including the name, address, and telephone number for each.
 - 1. Contractors are responsible for their subcontractors' compliance with requirements of [Chapter 4115](#) of the [Ohio Revised Code](#).
- G. Before employees start work on the project, supply them with written notification of their job classifications, prevailing wage rates, fringe benefit amounts, and the name of the Prevailing Wage Coordinator for the project.
- H. Supply all subcontractors with the Prevailing Wage Rates and changes.
- I. Submit certified payrolls within two (2) weeks after the initial pay period. Payrolls must include the following information:
 - 1. Employees' names, addresses, and social security numbers.
 - a. Corporate officers/owners/partners and any salaried personnel who do physical work on the project are considered employees. All rate and reporting requirements are applicable to these individuals.
 - 2. Employees' work classification.

- a. Be specific about the laborers and/or operators.
 - b. For all apprentices, show level/year and percent of journeyman's rate.
3. Hours worked on the project for each employee.
 - a. The number of hours worked in each day and the total number of hours worked each week.
4. Hourly rate for each employee.
 - a. The minimum rate paid must be the wage rate for the appropriate classification. The Department's Wage Rate Schedule sets this rate.
 - b. All overtime worked is to be paid at time and one-half for all hours worked more than forty (40) per week.
5. Where fringes are paid into a bona fide plan instead of cash, list each benefit and amount per hour paid to program for each employee.
 - a. When the amount contributed to the fringe benefit plan and the total number of hours worked by the employee on all projects for the year are documented, the hourly amount is calculated by dividing the total contribution of the employer by the total number of hours worked by the employee.
 - b. When the amount contributed to the fringe benefit is documented but not the total hours worked, the hourly amount is calculated by dividing the total yearly contribution by 2,080.
6. Gross amount earned on all projects during the pay period.
7. Total deductions from employee's wages.
8. Net amount paid.
- J. The reports shall be certified by the contractor, subcontractor, or duly appointed agent stating that the payroll is correct and complete; and that the wage rates shown are not less than those required by the [O.R.C. 4115](#).
- K. Submit the notarized Affidavit Regarding Prevailing Wages with the final statement of billing upon the completion of the project.

PROPOSAL and BID FORMS

BID PROPOSAL
Trail Lake Park-Trailhead and Trails
PORTAGE PARK DISTRICT, OHIO

Federal ID# or Social Security #: _____

Name of Bidder: _____

Address of Bidder: _____

Phone No.: _____

Fax No.: _____

Email: _____

Contact Person: _____

Date: _____

Proposal of _____ (hereinafter called "Bidder")* a corporation,
organized and existing under the laws of the State of _____,** a partnership, or an individual doing
business as _____.

To the **Portage Park District** (hereinafter called "Owner")

Gentlemen/Ladies:

The Bidder, in compliance with your invitation for bids for the Trail Lake Park Trailhead and Trails project, Portage County, Ohio, offers the following proposal. The project encompasses primarily the installation of a handicapped accessible concrete trailhead and handicapped accessible 1.6 mile trail and associated earthwork at Trail Lake Park. The bidder, having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish labor, materials, equipment, and supplies and to construct the project in accordance with the contract documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in the written "Notice to Proceed" of the Owner and to Substantially Complete with the project by **December 15, 2020**. Bidder further agrees to pay as liquidated damages, the sum of \$250.00 for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

CONTRACT BID FORM

Trail Lake Park-Trailhead and Trails Project

The bidder agrees that this bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids. Upon receipt of written notice of the acceptance of this bid, bidder will execute the formal contract attached within ten (10) days and deliver a Surety Bond or Bonds as required by the General conditions. The bid security attached in the sum of is to become the property of the owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

I, (print name of representative) _____,

representing (print name of company) _____

offer a BASE BID amount of (write out in words) _____ dollars

ALTERNATE A BID _____ dollars

ALTERNATE B BID _____ dollars

ALTERNATE C BID _____ dollars

Signed _____ Date _____

Engineer's Estimate of Probable Cost

Base Bid: \$488,750

Alternate A: \$116,880

Alternate B: \$272,575

Alternate C: \$297,533

**COMPLETE AND SUBMIT THE FOLLOWING DETAILED BID FORM WITH ALTERNATES
ATTACH A RESOURCE-LOADED PROJECT SCHEDULE**

BID FORM

TRAIL LAKE PARK TRAILHEAD AND TRAILS

Ref.	Item No.	Description	Quantity	Units	Unit Cost	Item Cost
BASE BID						
1	201	Clearing and Grubbing	1	L.S.		
2	201	Tree Removal	35	EA.		
3	203*	Excavation	2,095	C.Y.		
4	203*	Embankment	2,215	C.Y.		
5	204	Subgrade Compaction	9,120	S.Y.		
6	204*	Subgrade Compaction for Existing Trail Regrade	3,100	S.Y.		
7	209*	Linear Grading	1,500	LF.		
8	304*	Aggregate Base (T=6-in) for Existing Trail Regrade	517	C.Y.		
9	452	Non-Reinforced Concrete Pavement (T=12-in)	259	S.Y.		
10	601	RCP Type C (T=8-in)	23	C.Y.		
11	601	12-in Storm Sewer	30	LF.		
12	601	Headwall, 8-ft Concrete	1	EA.		
13	623	Construction Layout Stakes and Surveying	1	L.S.		
14	624	Mobilization	1	L.S.		
15	653	Topsoil Furnished and Placed (T=4-in)	634	C.Y.		
16	659	Seeding and Mulching	1	L.S.		
17	832	Sediment and Erosion Control	1	L.S.		
18	832	Temporary Construction Drive	1	L.S.		
19	SPEC	Water Bars	1	L.S.		
20	SPEC	Crushed Limestone Aggregate (#10 chips and dust) furnished, placed compacted (T=3")	26	CY		
<div style="display: flex; justify-content: space-between;"> <div> <small>*DENOTES CONTINGENCY ITEM, AS DIRECTED BY THE ENGINEER</small> <small>SPEC - REFER TO PLAN NOTES, DETAILS & SUPP SPECS</small> </div> <div> BASE CONSTRUCTION BID = \$ </div> </div>						
ALTERNATE A - Compacted Limestone trail surface						
A1	SPEC	Crushed Limestone Aggregate (#10 chips and dust) furnished, placed compacted	1,948	CY		
ALTERNATE A TOTAL = \$						
ALTERNATE B - Chip and Seal trail surface						
B1	304	Aggregate Base (T=Varies)	1,511	C.Y.		
B2	422	Chip Seal (Single 2" Compacted Layer)	7,881	S.Y.		
ALTERNATE B TOTAL = \$						
ALTERNATE C - Asphalt trail surface						
C1	304	Aggregate Base (T=Varies)	1,314	C.Y.		
C2	407	Tack Coat (0.05 Gal/SY)	394	GAL		
C3	441	Asphalt Concrete Surface Course, Type 1, (448), PG64-22 (T=1-1/4-in)	274	C.Y.		
C4	441	Asphalt Concrete Intermediate Course, Type 2, (448) (T=1-3/4-in)	383	C.Y.		
ALTERNATE C TOTAL = \$						

AFFIDAVIT OF CONTRACTOR OR SUPPLIER OF NON-DELINQUENCY OF PERSONAL PROPERTY TAXES

O.R.C. 5719.042

STATE OF OHIO)
)ss:
COUNTY OF _____)

TO: Portage Park District

The undersigned, being first duly sworn, having been awarded a contract by you for the Trail Lake Park-Trailhead and Trails, Portage County, Ohio, hereby states that we were not charged at the time the bid was submitted with any delinquent property taxes on the general tax list of property of any county in which you as a taxing district have territory and that we were not charged with delinquent property taxes on any such tax list.

In consideration of the award of the above contract, the above statement is incorporated in said contract as a covenant of the undersigned.

Affiant

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

Notary Public

CERTIFICATION OF COMPLIANCE WITH SECTION 3517.13 OF THE O.R.C.

CONTRACTS AWARDED TO INDIVIDUAL, PARTNERSHIP, OTHER UNINCORPORATED BUSINESS, ASSOCIATION (INCLUDING A PROFESSIONAL ASSOCIATION ORGANIZED UNDER CHAPTER 1785), ESTATE, OR TRUST MUST CONTAIN THE FOLLOWING CERTIFICATION:

Any contract for goods or services costing more than five hundred dollars must contain a certification by the contracting entity (vendor) that all of the following persons are in compliance with 3517.13(1)(1), limiting campaign contributions to the holder of the public office having the ultimate responsibility for the award of the contract:

- THE INDIVIDUAL
- EACH PARTNER OR OWNER OF THE PARTNERSHIP OR UNINCORPORATED BUSINESS
- EACH SHAREHOLDER OF THE ASSOCIATION
- EACH ADMINISTRATOR OF THE ESTATE
- EACH EXECUTOR OF THE ESTATE
- EACH TRUSTEE OF THE TRUST
- EACH SPOUSE OF ANY OF THE PRECEEDING PERSONS
- EACH CHILD SEVEN YEARS TO SEVENTEEN YEARS OF AGE OF ANY OF THE PRECEEDING PERSONS
- ANY COMBINATION OF THE PERSONS LISTED ABOVE

CONTRACTS A WARDED TO A CORPORATION OR BUSINESS TRUST (EXCEPT A PROFESSIONAL ASSOCIATION ORGANIZED UNDER CHAPTER 1785) MUST CONTAIN THE FOLLOWING CERTIFICATION:

Any contract for goods or services costing more than five hundred dollars must contain a certification by the contracting entity (vendor) that all of the following persons are in compliance with 3517. 13(J)(1), limiting campaign contributions to the holder of the public office having the ultimate responsibility for the award of the contract:

- EACH OWNER OF MORE THAN TWENTY PER CENT OF THE CORPORATION OR BUSINESSTRUST
- EACH SPOUSE OF AN OWNER OF MORE THAN TWENTY PER CENT OF THE CORPORATION OR BUSINESS TRUST
- EACH CHILD SEVEN YEARS TO SEVENTEEN YEARS OF AGE OF AN OWNER OF MORE THAN TWENTY PER CENT OF THE CORPORATION OR BUSINESS TRUST
- ANY COMBINATION OF THE PERSONS LISTED ABOVE

It is hereby certified that all of the persons listed above are in compliance with section 3517.13(1)(1) or 3517.13(J)(1) of the Ohio Revised Code.

IF CONTRACTING ENTITY IS A NONPROFIT CORPORATION ESTABLISHED UNDER ORC CHAPTER 1702, THE UNDERSIGNED CERTIFIES THAT SECTIONS 3517.13(1)(1) AND 3517.13(J)(1) ARE NOT APPLICABLE TO THE CONTRACTING ENTITY.

PRINTED NAME

TITLE

SIGNATURE

DATE

AFFIDAVIT OF COMPLIANCE WITH OHIO REVISED CODE SECTION 3517.13

STATE OF OHIO)
)SS
COUNTY OF _____)

_____, being duly sworn, deposes and states as follows:

1. I am duly authorized to make the statements contained herein on behalf of _____ ("the Contracting Party").
2. The Contracting Party is a/an (select one):
 - ☐ Individual, partnership, or other unincorporated business association (including, without limitation, a professional association organized under Ohio Revised Code Chapter 1785), estate, or trust.
 - ☐ Corporation organized and existing under the laws of the State of _____
 - ☐ Labor organization
 - ☐ Other _____
3. I hereby affirm that the Contracting Party and each of the individuals specified in **R.C. 3517.13(I)** (with respect to non-corporate entities and labor organizations) or **R.C. 3517.13(J)** (with respect to corporations) are in full compliance with the political contribution limitations set forth in **R.C. 3517.13(I)** and **(J)**, as applicable.

Affiant further sayeth naught.

By _____

Title _____

SWORN TO BEFORE ME and subscribed in my presence this _____ day of _____, 20_____.

Notary Public _____

My commission expires _____

NON-COLLUSION AFFIDAVIT

State of Ohio)
)ss
County of _____)

Bid Identification: Trail Lake Park Trailhead and Trails

CONTRACTOR _____, being first duly sworn, deposes and says that he/she is _____ (sole owner, a partner, president, secretary, etc.) of _____ the party making the foregoing BID; that such BID is not made in the interest of or on behalf of any undisclosed person, partnership, company, association, organization, or corporation; that such Bid is genuine and not collusive or sham; that said BIDDER has not directly or indirectly induced or solicited any other BIDDER to put in a false or sham BID, and has not directly or indirectly colluded, conspired, connived, or agreed with any BIDDER or anyone else to put in a sham BID, or that any one shall refrain from bidding; that said BIDDER has not in any manner, directly or indirectly, sought by agreement, communication or conference with anyone to fix the BID price of said BIDDER or of any other BIDDER, or to fix any overhead, profit, or cost element of such BID price, or of that of any other BIDDER, or to secure any advantage against the OWNER awarding the contract or anyone interested in the proposed contract; that all statements contained in such BID are true; and, further, that said BIDDER has not, directly or indirectly, submitted his/her BID price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid any fee or will not pay any fee in connection therewith, to any corporation, partnership, company, association, organization, BID depository, or to any member or agent thereof, or to any other individual except to such person or persons as have a partnership or other financial interest with said BIDDER in his/her general business.

Subscribed and sworn to before me this _____ day of _____, 20 .

Affiant

Notary Public

INCOME TAX AFFIDAVIT

STATE OF _____)
)ss

COUNTY OF _____)

_____ being first duly sworn deposes and says as follows:

1. That he holds the office of _____ in _____;
Title Company
2. That said Company will comply in all respects with the Income Tax Ordinances and Regulations, within
Garrettsville, Mantua or Portage County, as the same pertain to said construction project;
3. More affiant sayeth not.

Authorized Signature

Swore to a subscribed in my presence, this _____ day of _____, 20__.

Notary Public, State of Ohio

My commission expires _____, 20__.

Recorded in _____ County

CERTIFICATION AGAINST DEBARMENT AND SUSPENSION

The bidder hereby certifies, except as noted below, under penalty of perjury and under other such penalties as the laws of this state and the United States of America provide, that the company or any person associated therewith in the capacity of owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the administration of federal funds is **not** currently under suspension, debarment, voluntary exclusion or determination of ineligibility by any federal agency; that the company or any person associated therewith in the capacity of owner, partner, director, officer, principal investigator, project director, manager, auditor, or any position involving the administration of federal funds has **not** been suspended, debarred, voluntarily excluded or determined ineligible by any federal agency within the past three (3) years; that the company or any person associated therewith in the capacity of owner, partner, director, manager, auditor, or any position involving the administration of federal funds does **not** have a proposed debarment pending; that the company or any person associated therewith in the capacity of owner, partner, director, officer, principal investigator has **not** been indicted, convicted, or had a civil judgment rendered against the company, or themselves by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three (3) years.

If there are exceptions to any of the above clauses please set out the exceptions on the lines below. Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted, indicate below to whom it applies, initiating agency and dates of action. Providing false information may result in criminal prosecution or administrative sanctions.

Execution of this proposal on the signature portion thereof shall constitute also signature of this certification as permitted by Title 28 United States Code, Section 1746.

Exceptions:

Signed: _____

Title: _____

UNRESOLVED FINDING FOR RECOVERY CERTIFICATION

I, _____
(Name of person signing affidavit) (Title)

do hereby certify that _____ **does not**
(Company or Individual Name)

have an unresolved finding for recovery issued by the Auditor of the State of Ohio as

defined by Ohio Revised Code (ORC) Section 9.24 as of _____, 20____.
(Date)

Signature of Officer or Agent

Name (Print)

STATE OF _____ (_____
(ss:

COUNTY OF _____ (_____)

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

Notary Public, State of Ohio

My commission expires _____, 20____.

Recorded in _____ County

TRAIL LAKE PARK-TRAILHEAD AND TRAILS
BID GUARANTY AND CONTRACT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,
_____1 as Principal and
_____2 as Surety, are hereby held and firmly bound unto
_____3 hereinafter called the Obligee, in the penal sum of the
dollar amount of the bid submitted by the Principal to the Obligee on this date _____to
undertake the project known as:

TRAIL LAKE PARK-TRAILHEAD AND TRAILS

The penal sum referred to herein shall be the dollar amount of the Principal's bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of _____DOLLARS (\$_____). If this item is left blank, the penal sum will be the full amount of the Principal's bid, including alternates. Alternatively, if completed, the amount stated must not be less than the full amount of the bid, including alternatives in dollars and cents. A percentage is not acceptable.

For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above named Principal has submitted a bid on the above referred to project;

NOW, THEREFORE, if the Obligee accepts the bid of the Principal and the Principal fails to enter into a proper contract in accordance with the bid, plans, details, specifications, and bills of material; and in the event the Principal pays to the Obligee the difference not to exceed ten percent of the penalty hereto between the amount specified in the bid and such larger amount for which the Obligee may in good faith contract with the next lower bidder to perform the work covered by the bid; or in the event the Obligee does not award the contract to the next lower bidder and resubmits the project for bidding, the Principal will pay the Obligee the difference, not to exceed ten percent of the penalty hereof between the amount specified in the bid, or the costs, in connection with the resubmission, or printing new contract documents, required advertising and printing and mailing notices to prospective bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect. If the obligee accepts the bid of the Principal and the Principal within ten days after the awarding of the contract, enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of material, which said contract is made a part of this bond the same as though set forth herein; and

1 Here insert full name or legal title of Contractor and address

2 Here insert full name or legal title of Surety

3 Here insert full name or legal title of Owner/Obligee

(cont'd)

Bid Guaranty/Contract Bond p2

IF THE SAID Principal shall well and faithfully perform each and every condition of such contract; and indemnify the Obligee against all damage suffered by failure to perform such contract according to the provisions thereof and in accordance with the plans, details, specifications, and bills of material therefore; and shall pay all lawful claims of subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said contract: we agreeing and assenting that this undertaking shall be for benefit of any subcontractors, materialmen or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of said contract or in or to the plans and specifications therefore shall in any way affect that obligations of said Surety on this bond, and it does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

SIGNED AND SEALED this _____ day of _____, 20____.

Principal By:

Title:

Surety By:

Attorney-in-Fact

Surety Company Address:

Surety Agent's Name/Address:

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered and the data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The bidder may submit any additional information he desires.

1. Name of bidder?
2. Permanent main office address?
3. When organized?
4. If a corporation, where incorporated?
5. Federal Identification Number?
6. How many years have you been engaged in the contracting business under your present firm or trade name?
7. Contracts on hand (schedule these, showing amount of each contract and the appropriate anticipated dates of completion)?
8. General character of work performed by your company?
9. Have you ever failed to complete any work awarded to you? If so, where and why?
10. Have you ever defaulted on a contract? If so, where and why?
11. List the more important projects recently completed by your company, stating the approximate cost for each, and the month and year completed?
12. List your major equipment available for this contract?
13. Experience in construction work similar in importance to this project?
14. Background and experience of the principal members of your organization, including the officers?
15. Credit available?
16. Give bank reference?
17. Will you, upon request, fill out a detailed financial statement and furnish any other information that may be required by the Portage Park District, Ohio?
18. The undersigned hereby authorizes and requests one person, firm, or corporation to furnish any information requested by the Portage Park District, Ohio, in verification of the recitals comprising this Statement of Bidder's Qualifications.

Affidavit (To be attached to Bidder's Statement of Qualifications)

Dated at _____ on this _____ day of _____, 20____.

Name of Bidder: _____

By: _____

Title: _____

State of Ohio)

)ss

County of Portage)

_____being duly sworn, deposes and says that he is

_____ of _____ and that the answers to the
(Title) (Company)

foregoing questions and all statements therein contained are true and correct.

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public Signature

My Commission expires_____.

PROPOSED SUBCONTRACTOR'S BREAKDOWN						
Contractor Name	Address	Phone	Goods/ Services	Total Contracts	Fed I.D. No.	Reg'd MBD(Y/N)

Sworn to and ascribed before me this _____ day of _____, 20____

Company Name

Notary Public Signature

Notary Public in and for County of _____

Signature _____ Title _____

My Commission Expires _____

CONTRACT FORMS

TRAIL LAKE PARK-TRAILHEAD AND TRAILS CONTRACT

THIS AGREEMENT is made this _____ day of _____, 20____, by and between _____, hereinafter called the "Contractor" and the Portage Park District, hereinafter called the "Owner".

The Contractor and the Owner for the considerations stated herein mutually agree as follows:

ARTICLE 1. Statement of Work

The Contractor shall furnish all supervision, technical personnel, labor, materials, machinery, tools, equipment, supplies, and services, including utility and transportation services, and perform and complete all work required for the construction of the improvements embraced in the project; namely, Trail Lake Park-Trailhead and Trails, and required supplemental work for the project all in strict accordance with the Contract Documents.

ARTICLE 2. The Contract Price

The Owner will pay the Contractor at the lump sum price stipulated in the Bid for the respective items of work completed for the sum not to exceed _____ subject to additions and deductions as provided in the Contract Documents.

ARTICLE 3. Contract

The executed Contract Documents shall consist of the following:

- a. This Agreement
- b. Addenda
- c. Invitation to Bid
- d. Instructions to Bidders
- e. Bid Forms
- f. Signed copy of bid
- g. Work Specifications (including all plans, drawings, etc.)
- h. General and Special Provisions
- i. Technical Specifications
- j. State Requirements

(cont'd)
(Contract p2)

This Agreement, together with other documents enumerated in this ARTICLE 3, which said other documents are as fully a part of the Contract as if hereto attached or herein repeated, forms the Contract between the parties hereto. In the event that any provision, in any component part of this Contract conflicts with any provision of any other component part, the provision of the component part first enumerated in this ARTICLE 3 shall govern except as otherwise specifically stated.

IN WITNESS WHEREOF, the parties hereto have caused this AGREEMENT to be executed in three original copies on the day and year first above written.

CONTRACTOR:

OWNER: **Portage Park District**

Signature

Signature

(Typed Name)

(Typed name)

Title

Title

Vendor

Federal Identification Number:

Certifications:

I, _____, certify that I am the _____ of the corporation
(name) (title)
named as Contractor herein; that _____ who signed this Agreement on behalf
(name)
of the Contractor, was then _____ of said corporation; that said Agreement was
(title)
duly signed for and in behalf of said corporation by authority of its governing body, and is within the scope
of its corporate powers.

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, Portage County Assistant, the duly authorized and acting legal representative of the Portage Park District, do hereby certify as follows:

I have examined the attached contract and surety bond and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements have been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligation upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Pursuant to Ohio Revised Code 153.44 I hereby certify that this contract and the contract documents incorporated herein have been executed in accordance with Ohio Revised Code 153.01 through 153.60 inclusive.

Name,	Title

Date: _____

AUDITOR'S CERTIFICATE

I hereby certify that the amount of \$_____ required to meet the obligation for the above contract has lawfully been appropriated for such purposes and is in the treasury to the credit of Fund No. _____ free from any obligation or certificate now outstanding.

Janet Esposito, Portage County Auditor Signature

Date: _____



INDEPENDENT CONTRACTOR/WORKER ACKNOWLEDGMENT

Ohio Public Employees Retirement System
277 East Town Street, Columbus, Ohio 43215-4642

Employer Outreach: 1-888-400-0965
www.opers.org

This form is to be completed if you are an individual who begins providing personal services to a public employer on or after Jan. 7, 2013 but are not considered by the public employer to be a public employee and will not have contributions made to OPERS. This form must be completed not later than 30 days after you begin providing personal services to the public employer. **COMPLETE THIS FORM IF YOUR COMPANY EMPLOYS 5 EMPLOYEES OR LESS.**

STEP 1: Personal Information

Social Security Number

— — — — —

First Name

MI

Last Name

Name of Current Employer

STEP 2: Public Employment Information

Name of Public Employer for Which You Are Providing Personal Services

Employer Contact

First Name

MI

Last Name

Employer Code

Employer Contact Phone Number

— — — — —

Service Provided to Public Employer

Start Date of Service

Month Day Year

/ /

End Date of Service

Month Day Year

/ /

STEP 3: Acknowledgment

The public employer identified in Step 2 has identified you as an independent contractor or another classification other than a public employee. Ohio law requires that you acknowledge in writing that you have been informed that the public employer identified in Step 2 has classified you as an independent contractor or another classification other than a public employee for the services described in Step 2 and that you have been advised that contributions to OPERS will not be made on your behalf for these services.

If you disagree with the public employer's classification, you may contact OPERS to request a determination as to whether you are a public employee eligible for OPERS contributions for these services. Ohio law provides that a request for a determination must be made within five years after you begin providing personal services to the public employer, unless you are able to demonstrate through medical records to the Board's satisfaction that at the time the five-year period ended, you were physically or mentally incapacitated and unable to request a determination.

By signing this form, you are acknowledging that the public employer for whom you are providing personal services has informed you that you have been classified as an independent contractor or another classification other than a public employee and that no contributions will be remitted to OPERS for the personal services you provide to the public employer. This acknowledgment will remain valid as long as you continue to provide the same services to the same employer with no break in service regardless of whether the initial contract period is extended by any additional agreement of the parties. You also acknowledge that you understand you have the right to request a determination of your eligibility for OPERS membership if you disagree with the public employer's classification.

This form must be retained by the public employer and a copy sent to OPERS. The public employer's failure to retain this acknowledgment may extend your right to request a determination beyond the five years referenced above.

Signature _____
Do not print or type name Date _____

NOTICE OF AWARD

TO: _____

Date: _____

Project Title: **TRAIL LAKE PARK-TRAILHEAD AND TRAILS**

The Owner has considered the bid submitted by you on _____, 20____, for the above described work in response to its Advertisement for Bids and Information for Bidders.

You are hereby notified that your bid has been accepted in the amount of \$_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required contractor's contract bond, if applicable, and certificates of insurance within ten (10) calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said bond within ten (10) days from the date of this notice, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your bid as abandoned and as a forfeiture of your bid guaranty subject to the liability as set forth in Section 153.54 of the Ohio Revised Code. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the Owner.

Owner: Portage Park District

_____	_____	_____
Name	Signature	Title

ACKNOWLEDGMENT OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by
_____ on this _____ day of _____, 20____.

Name

By: _____
Name Signature Title

NOTICE TO PROCEED

TO: _____

Date: _____

Project Description: Trail Lake Park-Trailhead and Trails

You are hereby notified to commence work in accordance with the Agreement dated _____, 20____, on or before _____, 20____, and you are to complete the work within _____ () consecutive calendar days thereafter. The date of completion of all work is therefore _____, 20____.

Owner: Portage Park District

Name	Signature	Title
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ACKNOWLEDGMENT OF NOTICE

Receipt of the above Notice To Proceed is hereby acknowledged by
_____ on this _____ day of _____, 20____.
Name

By: _____
Name Signature Title

CHANGE ORDER

Change Order No. _____

Project: **TRAIL LAKE PARK-TRAILHEAD AND TRAILS**

Date: _____

- I. The following changes are hereby made to the contract documents (attach documentation):
- II. The following change is made to the contract price:

Original contract price	\$ _____
Previous change/extras	\$ _____
This change/extra	\$ _____
Subtotal	\$ _____
Deductions	\$ _____
Net total	\$ _____

- III. The following change is made to the contract time:

The contract time will be (increased) (decreased) by _____ calendar days, making the date for completion of all work _____.

- IV. _____ There will be no claims for damages resulting from this change.
- _____ Claims for damages resulting from this change are anticipated for such categories as _____ and should not exceed \$ _____.

Change requested by _____ Date _____

Change recommended by _____ Date _____

Change accepted by _____ Date _____

**AFFIDAVIT OF CONTRACTOR OR SUBCONTRACTOR
FOR MINIMUM WAGES**

STATE OF _____)
)ss

COUNTY OF _____)

I, _____, _____, of the
(Affiant) (Title)

_____, do hereby certify that the wages paid
(Name of Contractor/Subcontractor)

to all employees for the full number of hours worked in connection with _____

_____ during the period from _____ to
(Description of Project) (Start)

_____ is in accordance with the minimum rate of wages prescribed by
(End)

the contract documents.

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

(Signature of officer/ agent)

Sworn to before me this _____ day of _____, 20_____.

Notary Public

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

AFFIDAVIT OF COMPLETION

STATE OF _____)
)ss
COUNTY OF _____)

being first duly sworn, deposes and says that he/she is _____
(sole owner, a partner, president, secretary, etc.)

of _____
(Company Name)

The Party that entered into a contract with the PORTAGE PARK DISTRICT on the

day of _____ 20____ for the construction of the PROJECT NAME Project, and that all claims
and obligations for services, labor, tools, appliances, materials, equipment, and damages to personal
property and/or bodily injury arising in connection with this contract have been satisfactorily settled,
and that the rate of wages paid has been in compliance with Chapter 4115 of the Ohio Revised Code.

SIGNED: _____

Sworn to and subscribed before me, a Notary Public this
_____ day of _____, 20____.

Notary Public

My commission expires _____, 20 .
(SEAL)

WAGE RATES

For

Trail Lake Park-Trailhead and Trails

605 Ravenna Road, Streetsboro, Portage County, Ohio

Prevailing Wage Rate

Skilled Crafts

Name of Union: Truck Driver Bldg & Hwy Class 2
Locals 20,40,92,92b,100,175,284,438,377,637,908,957

Change # : LCRO1-2019-fbBldgHwy

Craft : Truck Driver **Effective Date :** 10/16/2019 **Last Posted :** 10/16/2019

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECE T (*)	MISC (*)		
Classification												
Truck Driver CLASS 2 Tractor Trailer-Semi Tractor Trucks-Pole Trailers-Ready Mix Trucks-Fuel Trucks- Asphalt-Oil Spray bar men- 5 Axle & Over -Belly Dumps- End Dumps- Articulated Dump Trucks- Low boys- Heavy duty Equipment(irrespective of load carried) when used exclusively for transportation-Truck Mechanics (when needed)	\$28.46		\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.56	\$57.79
Apprentice	Percent											
First 6 months	80.00	\$22.77	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.87	\$49.25
7-12 months	85.00	\$24.19	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$39.29	\$51.39
13-18 months	90.00	\$25.61	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.71	\$53.52
19-24 months	95.00	\$27.04	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$42.14	\$55.66

25-30 months	100.00	\$28.46	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.56	\$57.79
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Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, LORAIN, LUCAS, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, UNION, VAN WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

** Asphalt - Oil spray bar man when operating from cab shall receive \$0.20 cents per hour above their Basic Hourly Rate.

Prevailing Wage Rate

Skilled Crafts

Name of Union: Truck Driver Bldg & Hwy Class 1
Locals 20,40,92,92b,100,175,284,438,377,637,908,957

Change # : OCRO1-2019fbBldgHwy

Craft : Truck Driver **Effective Date :** 09/11/2019 **Last Posted :** 09/11/2019

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECE T (*)	MISC (*)		
Classification												
Truck Driver CLASS 1 4 wheel service, dump, and batch trucks, Oil Distributor - Asphalt Distributor-Tandems	\$28.04		\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.14	\$57.16
Apprentice	Percent											
First 6 months	80.00	\$22.43	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$37.53	\$48.75
7-12 months	85.00	\$23.83	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$38.93	\$50.85
13-18 months	90.00	\$25.24	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$40.34	\$52.95
19-24 months	95.00	\$26.64	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$41.74	\$55.06
25-30 months	100.00	\$28.04	\$7.00	\$7.90	\$0.20	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$43.14	\$57.16

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

3 Journeymen to 1 Apprentice

ADAMS, ALLEN, ASHLAND, ASHTABULA,
ATHENS, AUGLAIZE, BELMONT, BROWN,
BUTLER, CARROLL, CHAMPAIGN,
CLARK, CLERMONT, CLINTON,
COLUMBIANA, COSHOCTON,
CRAWFORD, DARKE, DEFIANCE,
DELAWARE, ERIE, FAIRFIELD, FAYETTE,
FRANKLIN, FULTON, GALLIA, GREENE,
GUERNSEY, HAMILTON, HANCOCK,
HARDIN, HARRISON, HENRY, HIGHLAND,
HOCKING, HOLMES, HURON, JACKSON,
JEFFERSON, KNOX, LAWRENCE,
LICKING, LOGAN, LORAIN, LUCAS,
MADISON, MAHONING, MARION,
MEDINA, MEIGS, MERCER, MIAMI,
MONROE, MONTGOMERY, MORGAN,
MORROW, MUSKINGUM, NOBLE,
OTTAWA, PAULDING, PERRY,
PICKAWAY, PIKE, PORTAGE, PREBLE,
PUTNAM, RICHLAND, ROSS, SANDUSKY,
SCIOTO, SENECA, SHELBY, STARK,
SUMMIT, TRUMBULL, TUSCARAWAS,
UNION, VAN WERT, VINTON, WARREN,
WASHINGTON, WAYNE, WILLIAMS,
WOOD, WYANDOT

Special Jurisdictional Note :

Details :

** Asphalt - Oil spray bar man when operating from cab shall receive \$0.20 cents per hour above their Basic Hourly Rate.

Prevailing Wage Rate

Skilled Crafts

Name of Union: Operating Engineers - HevHwy Zone I

Change # : LCN01-2020fbLoc18hevhwyI

Craft : Operating Engineer Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Operator Class 1	\$39.73		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.18	\$75.04
Class 2	\$39.63		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.08	\$74.90
Class 3	\$38.59		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$54.04	\$73.34
Class 4	\$37.37		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$52.82	\$71.50
Class 5	\$32.08		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.53	\$63.57
Class 6	\$39.98		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.43	\$75.42
Apprentice	Percent											
1st Year	50.00	\$19.86	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$35.32	\$45.25
2nd Year	60.00	\$23.84	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$39.29	\$51.21
3rd Year	70.00	\$27.81	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$43.26	\$57.17
4th Year	80.00	\$31.78	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.23	\$63.13
Field Mech Trainee												
1st year	49.85	\$19.81	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$35.26	\$45.16
2nd year	59.85	\$23.78	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$39.23	\$51.12
3rd year	69.82	\$27.74	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$43.19	\$57.06
4th year	79.78	\$31.70	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.15	\$62.99

Special Calculation Note : Other: Education & Safety Fund is \$0.09 per hour.

Ratio :

For every (3) Operating Engineer Journeymen employed by the company , there may be employed (1) Registered Apprentice or Trainee Engineerthrough the referral when they are available. An apprentice, while employed as

Jurisdiction (* denotes special jurisdictional note) :

ASHTABULA, CUYAHOGA, ERIE, GEAUGA, LAKE, LORAIN, MEDINA, PORTAGE, SUMMIT

part of a crew per Article VIII paragraph 65,
will not be subject the apprenticeship ratios in
this collective bargaining agreement.

Special Jurisdictional Note :

Details :

****Apprentices** will receive a 10% increase on top of the percentages listed above provided they are operating mobile equipment. **Mechanic Trainees** will receive 10% if required to have a CDL.

Class 1 - Air Compressors on Steel Erection; Asphalt Plant Engineers (Cleveland District Only); Barrier Moving Machine; Boiler Operators, Compressor Operators, or Generators, when mounted on a rig; Boom Trucks (all types); Cableways; Cherry Pickers; Combination- Concrete mixers & Towers; Concrete Pumps; Concrete Plants (over 4 yd capacity); Cranes (all types); Derricks (all types); Draglines; Elevating Graders or Euclid Loaders; Gradalls; Helicopter Crew (Operator- hoist or winch); Hoes (all types); Hoisting Engines; Hoisting Engines, on shaft or tunnel work; Hydraulic Gantry (lifting system); Locomotives (standard guage); Maintenance Operators (class A); Mixers, paving (single or double drum); Piledriving Machines (all types); Power Shovels, Prentice Loader; Quad 9 (double pusher); Rail Tamper (with automatic lifting and aligning device); Refrigerating Machines (freezer operation); Rotary Drills, on caisson work; Side Booms; Slip Form Pavers; Tower Dericks; Trench Machines; Truck Mounted Concrete Pumps; Tug Boats; Tunnel Machines and /or Mining Machines; Wheel Excavators;Industrial-type tractors; Jet Engine - Dryer (D8 or D9) Diesel Tractors Mucking Machines; Multiple Scrapers; Tree Shreddes. Rough Terrain Fork-lift with Winch/Hoist; Compact Cranes,track or rubber over 4,000 pound capacity, self-erecting cranes:stationary,track or truck (all configurations) bucket trench machines (over 24 inches wide).

Class 2 - Asphalt Pavers; Automatic Subgrade Machines, self-propelled (CMI-type); Bobcat-type and /or skid steer loader with hoe attachment greater than 7000 lbs.; Boring Machine Operators (more than 48 inches); Bulldozers; ;Endloaders; Hydro Milling Machine; Kolman-type Loaders (production type-dirt); Lead Greasemen; Maintenance Operators, Class B (Portage and Summit Counties only); Pettibone-Rail Equipment; Power Graders; Power Scrapers; Push Cats; Lighting and Traffic Signal Installation Equipment includes all groups or classifications; Trench Machines (24inch wide and under); Vermeer Type Concrete saw. Material Transfer Equipment (Shuttle buggy) Asphalt All rotomills, grinders and planers of all types. Horizontal Directional Drill (Over 50,000 ft.lbs.thrust and over).

Class 3 - A-Frames; Air Compressors, on tunnel work (low Pressure); All Asphalt Rollers; Asphalt Plant Engineers (Portage and Summit Counties only); Bobcat-type and/or skid steer loader with or without attachments; Power Boilers (15 lbs pressure and over); Highway Drills (all types); Pump Operators (installing or operating well Points); Pumps (4 inch and over discharge); Railroad Tie Inserter/Remover; Rotovator (lime-soil Stabilzer); Switch & Tie Tampers (without lifting and aligning device); Locomotives (narrow gage); Mixers, concrete

(more than one bag capacity); Mixers, one bag capacity (side loader); Utilities Operators, (small equipment); Welding Machines and Generators; Material hoist/elevators. Articulating/straight bed end dumps if assigned (minus \$4.00 per hour)

Class 4 - Ballast Re-loacator; Backfillers and Tampers; Batch Plant Operators; Bar and Joint Installing Machines; Boring Machine Operators (48 inch or less); Bull Floats; Burlap and Curing Machines; Concrete Plants (capacity 4 yd and under); Conveyors (highway); Concrete Saws (multiple); Crushers; Deckhands; Farm type tractors, with attachments (highway); Finishing Machines; Hydro Hammers; Hydro Seeders; Pavement Breakers (hydraulic or cable); Plant Mixers; Post Drivers; Post Hole Diggers; Power Brush Burners; Power Form Handling Equipment; Firemen, Floating Equipment (all types); Fork Lifts (highway), except masonry; Form Trenchers; Road Widening Trenchers; Rollers (brick, grade, macadam); Self-Propelled Power Spreaders; Self-Propelled Sub-Graders; Tractors, pulling sheepsfoot rollers or graders; Steam Firemen; Vibratory Compactors, with integral power.

Class 5 - Compressors (portable, Sewer, Heavy and Highway); Generators; Inboard-Outboard Motor Boat Launches; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalmen; Drum Fireman (in Asphalt Plant); Oil Heaters (Asphalt Plant); Tire Repairmen; VAC/ALLS; Fueling and greasing (Primary Operator with Specialized CDL Endorsement Add \$3.00/hr), compact cranes; track or rubber under 4,000 pounds.

Class 6 - Master Mechanic

Prevailing Wage Rate

Skilled Crafts

Name of Union: Operating Engineers - Building Local 18 - Zone I

Change # : LCN01-2020fbLoc18

Craft : Operating Engineer Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Operator Class 1	\$39.73		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.18	\$75.04
Class 2	\$39.63		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.08	\$74.90
Class 3	\$38.59		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$54.04	\$73.34
Class 4	\$37.37		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$52.82	\$71.50
Class 5	\$32.08		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.53	\$63.57
Class 6	\$39.98		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.43	\$75.42
Class 7	\$40.23		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$55.68	\$75.79
Class 8	\$40.73		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$56.18	\$76.54
Class 9	\$40.98		\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$56.43	\$76.92
Apprentice	Percent											
1st Year	50.00	\$19.86	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$35.32	\$45.25
2nd Year	60.00	\$23.84	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$39.29	\$51.21
3rd Year	70.00	\$27.81	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$43.26	\$57.17
4th Year	80.00	\$31.78	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.23	\$63.13
Field Mechanic Trainee												
1st Year	50.00	\$19.86	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$35.32	\$45.25
2nd Year	60.00	\$23.84	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$39.29	\$51.21
3rd Year	70.00	\$27.81	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$43.26	\$57.17
4th Year	80.00	\$31.78	\$8.51	\$6.00	\$0.85	\$0.00	\$0.00	\$0.09	\$0.00	\$0.00	\$47.23	\$63.13

Special Calculation Note : Other: Education & Safety Fund is \$0.09 per hour.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

For every (3) Operating Engineer Journeymen SUMMIT, PORTAGE employed by the company ,there may be employed (1) Registered Apprentice or Trainee Engineer through the referral when they are available. An apprentice, while employed as part of a crew per Article VIII, paragraph 77, will not be subject to the apprenticeship ratios in this collective bargaining

Special Jurisdictional Note :

Details :

Note: There will be a 10% increase for the apprentices on top of the percentages listed above provided they are operating mobile equipment. Mechanic Trainees will receive 10% increase if required to have CDL

Class 1 - Barrier Moving Machine; Boiler Operators or Compressor Operators, when compressor or boiler is mounted on crane (Piggyback Operation); Boom Trucks (all types); Cableways Cherry Pickers; Combination - Concrete Mixers & Towers; All Concrete Pumps with Booms; Cranes (all types) Derricks (all types); Draglines Dredges (dipper, clam or suction) 3-man crew; Elevating Graders or Euclid Loaders; Floating Equipment; Gradalls; Helicopter Operators; hoisting building materials; Helicopter Winch Operators, Hoisting building materials; Hoes (All types) Hoists (with two or more drums in use); Hydraulic Gantry (lift system); Laser Finishing Machines; Lift Slab or Panel Jack Operators; Locomotives (all types); Maintenance Engineers (Mechanic and/or Welder); Mixers, paving (multiple drum); Mobile Concrete Pumps, with booms, Panelboards, (all types on site); Pile Drivers; Power Shovels; Prentice Loader; Rail Tamper (with automatic lifting and aligning device); Rotary Drills (all), used on caissons for foundations and sub-structure work; Side Booms; Slip Form Pavers; Straddle Carriers (Building Construction on site); Tug Boats. Horizontal Directional Drill, Rough Terrain Fork-lift with Winch/Hoist, Laser Screed, and Like equipment, Compact Cranes, track or rubber over 4,000 pound capacity, self-erecting cranes: stationary, track or truck (all configurations) bucket trench machines (over 24 " wide).

Class 2 - Asphalt Pavers; Bobcat-type and/or skid steer loader with hoe attachment greater than 7000 lbs.; Bulldozers; CMI type Equipment; C; Endloaders; Hydro Milling Machine; Kolman-type Loaders (Dirt Loading); Lead Greasemen; Mucking Machines; Pettibone-Rail Equipment; Power Graders; Power Scoops; Power Scrapers; Push Cats; Vermeer Type Concrete Saw, All rotomills, grinders & planers of all types. Articulating/end dumps (minus \$4.00/hour from Class 2 rate)

Class 3 - A Frames; Air Compressors, Pressurizing Shafts or Tunnels; All Asphalt Rollers; Bobcat-type and/or skid steer loader with or without attachments; Boilers (15 lbs pressure and over); All concrete Pumps (without booms with 5 inch system); Fork Lifts (except masonry); Highway Drillers - all types (with integral power); Hoists (with one drum); House Elevators

(except those automatic call button controlled); Man Lifts; Mud Jacks; Pressure Grouting; Pump Operators (installing or operating Well Points or other types of Dewatering Systems); Pumps (4 inches and over discharge); Railroad Tie Inserter/Remover; Rotator (Lime-Soil Stabilizer); Submersible Pumps (4 inches and over discharge); Switch & Tie Tampers (without lifting and aligning device); Trench Machines (24 inches and under); Utility Operators, Material hoist/elevators.

Class 4 - Ballast Re-locator; Backfillers and Tampers; Batch Plant Operators; Bar and Joint Installing Machines; Bull Floats; Burlap and Curing Machines; Clefplanes; Compressors, on building construction; Concrete Spreader; Conveyors, used for handling building materials; Concrete Mixers, one bag capacity (side loader); Concrete Mixers, capacity more than one bag; Crushers; Deck Hands; Drum Fireman (in Asphalt Plant); Farm type tractors pulling attachments; Finishing Machines; Form Trenchers; Generators; Gunite Machines; Hydro-Seeders; Pavement Breakers (hydraulic or cable); Post Drivers; Post Hole Diggers; Pressure Pumps (over 1/2 inch discharge); Road Widening Trenchers; Rollers (except asphalt); All Concrete pumps (without Boom with 4 inch or smaller systems); self-propelled Power Spreaders; self-propelled Sub-graders; Shotcrete Machines; Tire Repairmen; Tractors, pulling sheepfoot rollers or graders; VAC/ALLS; Vibratory Compactors, with integral power; Welder Operators.

Class 5 - Boilers (less than 15 lbs. pressure); Inboard/outboard Motor Boat Launches; Light Plant Operators; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalmen, Submersible Pumps (under 4 inch discharge). Directional Drill Locator and Allen Screed Concrete Paver, Fueling & greasing (Primary Operator with Specialized CDL Endorsement Add \$3.00/ hour), compact cranes: track or rubber under 4,000 pounds.

Class 6 - Master Mechanic

Class 7 - Boom & Jib 150 - 180 feet

Class 8 - Boom & Jib 180 - 249 feet

Class 9 - Boom & Jib 250 - or over

Prevailing Wage Rate

Skilled Crafts

Name of Union: Labor Local 894 Building

Change # : LCN01-2018fbLoc894

Craft : Laborer Effective Date : 06/01/2018 Last Posted : 05/25/2018

	BHR	Fringe Benefit Payments							Irrevocable Fund	Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECE T (*)	MISC (*)		
Classification											
Laborer Group 1	\$31.07	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$42.07	\$57.61
Laborer Group 2	\$31.22	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$42.22	\$57.83
Laborer Group 3	\$31.27	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$42.27	\$57.91
Laborer Group 4	\$31.57	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$42.57	\$58.36
Laborer Group 5	\$26.10	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$37.10	\$50.15
Apprentice	Percent										
1ST 1-1000 hrs	60.00 \$18.64	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$29.64	\$38.96
2nd 1000-2000 hrs	70.00 \$21.75	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$32.75	\$43.62
3rd 2000-3000 hrs	80.00 \$24.86	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$35.86	\$48.28
4th 3000-4000 hrs	90.00 \$27.96	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$38.96	\$52.94
More than 4000 hrs	100.00 \$31.07	\$6.90	\$3.60	\$0.40	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$42.07	\$57.61

Special Calculation Note : \$0.10 for LECET is for Labor Management

Ratio :

1 Apprentice to 1 Journeymen
1 Apprentice to 4 Journeymen

Jurisdiction (* denotes special jurisdictional note) :

MEDINA, PORTAGE, SUMMIT

Special Jurisdictional Note :

Details :

Group 1

Building & Construction Laborer, Welder Helper, Carpenter Tender, Landscape Laborer, Mason Tender, Concrete Bucket Tender, Concrete & Construction Specialist, Asbestos Laborer, Toxic/Hazardous Waste Laborer, Lead Removal, Level D

Group 2

Air Driven Boring Machine, Tamper Operator, Asphalt Raker, Paving Bed Maker, Concrete Puddler on Building Work, Concrete Batch Dumper, Materials Mixer, Wire Mesh Handler, Hook-up on Demolition Work, Scaffold Erector, Structural, Precast Erector, Power Tools - Air, Gas or Electric, Hazardous Waste Laborer, Lead Removal Level C

Group 3

Pipe Layer, Rock Driller, Mucker-Tunnel, Burner, Form Setter, Power Saw Jackhammer, Bottom Man, Hod Carrier, Power Buggy or Power Wheelbarrow, Bob Cat, Skid Steer Work and or similar, Hazardous Waste Laborer, Lead Removal Level B

Group 4

Gunnite Nozzle Man, Tunnel Miner, Water Link Caulker, Dynamite Man, Structural Precast Welder, Pump Hose Nozzle Man, Hazardous Waste Laborer, Lead Removal Level A

Group 5

Watchman

Hazardous Waste Removal and Lead Abatement:

For Laborers, working in an exclusive or "hot" area with toxic or hazardous materials, one of the following personal protective equipment ensembles will be required.

Level A

When the area has been determined to contain extremely toxic contaminants or contaminants unknown but may be expected to be extremely toxic and/or immediately dangerous to life and health. This ensemble includes a fully encapsulated chemical suit, self contained breathing apparatus (SCBA) or airline fed respirator, and various types and numbers of boots and gloves; cool vests and voice-activated radios are optional equipment sometimes worn.

Level B

Protective equipment includes a chemically resistant splash suit and a SCBA or airline respirator. This ensemble is required when the situation is very hazardous, such as oxygen deficient atmospheres, IDLH atmospheres, or confined space entries, but the risk of skin exposure is not as great as in Level A situation.

Level C

Protective equipment includes a protective suit and an air purifying respirator (APR) with the appropriate filter canisters. The ensemble is used when the contaminants are reliably known not to be hazardous to the skin and not IDLH (Immediately Dangerous to Life or Health) and correct filter protection is available.

Level D

Protective Equipment to be worn only in established "safe zones" may consist of, from normal work clothes to normal skin protection such as gloves, face shields goggles, coveralls and occasionally respiratory protection.

Prevailing Wage Rate

Skilled Crafts

Name of Union: Labor HevHwy 2

Change # : LCN01-2020fbLaborHevHwy2

Craft : Laborer Group 1 Effective Date : 05/14/2020 Last Posted : 05/14/2020

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECE T (*)	MISC (*)		
Classification											
Laborer Group 1	\$33.05	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.40	\$60.92
Group 2	\$33.22	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.57	\$61.18
Group 3	\$33.55	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$44.90	\$61.67
Group 4	\$34.00	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$45.35	\$62.35
Watch Person	\$25.35	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.00	\$0.10	\$0.00	\$36.70	\$49.38
Apprentice	Percent										
0-1000 hrs	60.00	\$19.83	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.10	\$0.00	\$31.18	\$41.10
1001-2000 hrs	70.02	\$23.14	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.10	\$0.00	\$34.49	\$46.06
2001-3000 hrs	80.00	\$26.44	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.10	\$0.00	\$37.79	\$51.01
3001-4000 hrs	90.00	\$29.74	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.10	\$0.00	\$41.10	\$55.97
More Than 4000 hrs	100.00	\$33.05	\$7.00	\$3.80	\$0.45	\$0.00	\$0.00	\$0.10	\$0.00	\$44.40	\$60.92

Special Calculation Note : Watchman has no Apprentices. Tunnel Laborer rate with air-pressurized add \$1.00 to the above wage rate.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

1 Journeymen to 1 Apprentice
3 Journeymen to 1 Apprentice thereafter

ASHTABULA, ERIE, HURON, LORAIN,
LUCAS, MAHONING, MEDINA, OTTAWA,
PORTAGE, SANDUSKY, STARK, SUMMIT,
TRUMBULL, WOOD

Special Jurisdictional Note : Hod Carriers and Common Laborers - Heavy, Highway, Sewer, Waterworks, Utility, Airport, Railroad, Industrial and Building Site, Sewer Plant, Waste Water Treatment Facilities Construction

Details :

Group 1

Laborer (Construction); Plant Laborer or Yardman, Right-of-way Laborer, Landscape Laborer, Highway Lighting Worker, Signalization Worker, (Swimming) Pool Construction Laborer, Utility Man, *Bridge Man, Handyman, Joint Setter, Flagperson, Carpenter Helper, Waterproofing Laborer, Slurry Seal, Seal Coating, Surface Treatment or Road Mix Laborer, Riprap Laborer & Grouter, Asphalt Laborer, Dump Man (batch trucks), Guardrail & Fence Installer, Mesh Handler & Placer, Concrete Curing Applicator, Scaffold Erector, Sign Installer, Hazardous Waste (level D), Diver Helper, Zone Person and Traffic Control.

*Bridge Man will perform work as per the October 31, 1949, memorandum on concrete forms, by and between the United Brotherhood of Carpenters and Joiners of America and the Laborers' International Union of North America, which states in; "the moving, cleaning, oiling and carrying to the next point of erection, and the stripping of forms which are not to be re-used, and forms on all flat arch work shall be done by members of the Laborers' International Union of North America."

Group 2

Asphalt Raker, Screwman or Paver, Concrete Puddler, Kettle Man (pipeline), All Machine-Driven Tools (Gas, Electric, Air), Mason Tender, Brick Paver, Mortar Mixer, Skid Steer, Sheeting & Shoring Person, Surface Grinder Person, Screedperson, Water Blast, Hand Held Wand, Power Buggy or Power Wheelbarrow, Paint Striper, Plastic fusing Machine Operator, Rodding Machine Operator, Pug Mill Operator, Operator of All Vacuum Devices Wet or Dry, Handling of all Pumps 4 inches and under (gas, air or electric), Diver, Form Setter, Bottom Person, Welder Helper (pipeline), Concrete Saw Person, Cutting with Burning Torch, Pipe Layer, Hand Spiker (railroad), Underground Person (working in sewer and waterline, cleaning, repairing and reconditioning). Tunnel Laborer (without air), Caisson, Cofferdam (below 25 feet deep), Air Track and Wagon Drill, Sandblaster Nozzle Person, Hazardous Waste (level B), ***Lead Abatement, Hazardous Waste (level C)

***Includes the erecting of structures for the removal, including the encapsulation and containment of Lead abatement process.

Group 3

Blast and Powder Person, Muckers will be defined as shovel men working directly with the miners, Wrencher (mechanical joints & utility pipeline), Yarnier, Top Lander, Hazardous Waste (level A), Concrete Specialist, Curb Setter and Cutter, Grade Checker, Concrete Crew in Tunnels. Utility pipeline Tappers, Waterline, Caulker, Signal Person will receive the rate equal to the rate paid the Laborer classification for which the Laborer is signaling.

Group 4

Miner, Welder, Gunitite Nozzle Person

A.) The Watchperson shall be responsible to patrol and maintain a safe traffic zone including but not limited to barrels, cones, signs, arrow boards, message boards etc.

The responsibility of a watchperson is to see that the equipment, job and office trailer etc. are secure.

Prevailing Wage Rate

Skilled Crafts

Name of Union: Cement Mason & Plasterer Local 109

Change # : LCN01-2019fbLoc109

Craft : Cement Effective Date : 08/28/2019 Last Posted : 08/28/2019

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Cement Mason	\$29.54		\$8.59	\$6.90	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$49.49	\$64.26
Plasterer	\$28.83		\$8.09	\$6.90	\$0.40	\$0.00	\$3.75	\$0.06	\$0.00	\$0.00	\$48.03	\$62.44
Apprentice Cement Mason	Percent											
1st year	70.00	\$20.68	\$8.59	\$6.90	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$40.63	\$50.97
2nd year	80.00	\$23.63	\$8.59	\$6.90	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$43.58	\$55.40
3rd year	90.00	\$26.59	\$8.59	\$6.90	\$0.40	\$0.00	\$4.00	\$0.06	\$0.00	\$0.00	\$46.54	\$59.83
Plasterer Apprentice												
1st year	68.35	\$20.19	\$8.09	\$6.90	\$0.40	\$0.00	\$3.75	\$0.06	\$0.00	\$0.00	\$39.39	\$49.49
2nd year	78.10	\$23.07	\$8.09	\$6.90	\$0.40	\$0.00	\$3.75	\$0.06	\$0.00	\$0.00	\$42.27	\$53.81
3rd year	87.85	\$25.95	\$8.09	\$6.90	\$0.40	\$0.00	\$3.75	\$0.06	\$0.00	\$0.00	\$45.15	\$58.13

Special Calculation Note : Other is for International Training.

Ratio :

1 Journeymen to 1 Apprentice
5 Journeymen to 2 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CARROLL, HOLMES, MEDINA, PORTAGE,
STARK, SUMMIT, TUSCARAWAS, WAYNE

Special Jurisdictional Note :

Details :

Finishers when applying colorshake shall be paid an additional \$2.00 per DAY.
Swing Scaffolds up to 50 feet shall be paid \$0.25 above the Journeymen rate.

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Statewide HevHwy Exhibit B District II

Change # : LCN01-2019fbCementHevHwy

Craft : Cement Mason **Effective Date :** 05/01/2020 **Last Posted :** 04/30/2020

	BHR	Fringe Benefit Payments							Irrevocable Fund	Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Cement Mason	\$30.98	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$49.28	\$64.77
Apprentice	Percent										
1st Year	70.00 \$21.69	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$39.99	\$50.83
2nd Year	80.00 \$24.78	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$43.08	\$55.48
3rd Year	90.00 \$27.88	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$46.18	\$60.12

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 1 Apprentice
2 to 1 thereafter

Jurisdiction (* denotes special jurisdictional note) :

BROWN, BUTLER, CLERMONT, COLUMBIANA, DEFIANCE, ERIE, HAMILTON, HIGHLAND, HURON, LORAIN, MAHONING, MEDINA, OTTAWA, PAULDING, PORTAGE, SANDUSKY, SENECA, STARK, SUMMIT, TRUMBULL, WARREN, WILLIAMS

Special Jurisdictional Note : (B) Power Plant, Tunnels, Amusement Park, Athletic Stadium Site Work ,Pollution Control,Sewer Plant, Waste Plant, & Water Treatment Facilities, Construction.

Prevailing Wage Rate Skilled Crafts

Name of Union: Cement Mason Statewide HevHwy Exhibit A District II

Change # : LCN01-2020fbCementHevHwy

Craft : Cement Mason Effective Date : 05/01/2020 Last Posted : 04/30/2020

	BHR	Fringe Benefit Payments							Irrevocable Fund	Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Cement Mason	\$30.11	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$0.00	\$48.41	\$63.46
Apprentice	Percent										
1st Year	70.00	\$21.08	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$39.38	\$49.92
2nd Year	80.00	\$24.09	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$42.39	\$54.43
3rd Year	90.00	\$27.10	\$8.25	\$7.15	\$0.65	\$0.00	\$2.25	\$0.00	\$0.00	\$45.40	\$58.95

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 1 Apprentice
2 to 1 thereafter

Jurisdiction (* denotes special jurisdictional note) :

BROWN, BUTLER, CLERMONT,
COLUMBIANA, DEFIANCE, ERIE,
HAMILTON, HIGHLAND, HURON,
LORAIN, MAHONING, MEDINA, OTTAWA,
PAULDING, PORTAGE, SANDUSKY,
SENECA, STARK, SUMMIT, TRUMBULL,
WARREN, WILLIAMS

Special Jurisdictional Note : (A) Highway Construction, Sewer, Waterworks And Utility Construction, Industrial & Building Site, Heavy Construction, Airport Construction Or Railroad Construction Work.

Details :

SECTION 01 56 00 — TEMPORARY BARRIERS AND ENCLOSURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies requirements for providing temporary services and facilities, including the following:
1. Service Utilities
 2. Sanitary facilities
 3. Drinking Water
 4. Field Offices and Storage Sheds
 5. Temporary Pavement and Roads
 6. Temporary Parking
 7. Signs
 8. Site Security and Protection
 9. Collection and Disposal of Waste
 10. Construction Fence
 11. Worker Safety
 12. Environmental Protection

1.2 RESPONSIBILITY

- A. Unless otherwise specified, each prime and subcontractor shall furnish, install, and maintain temporary facilities and controls required for the construction of their work and their own construction personnel. Contractor shall remove such temporary facilities and controls upon completion of their work. All facilities and controls shall comply with Federal, State, and Local codes and safety regulations.
- B. Each Contractor shall provide construction aids and equipment required to assure the complete and total safety of his personnel and to facilitate the execution of the work. All such equipment shall meet current OSHA requirements.
- C. Each Contractor shall relocate facilities as required to accommodate the progress of construction, storage or work requirements, or to accommodate the requirements of the Owner, and other contractors employed at the site.
- D. At the completion of the Contractor's work, or where otherwise directed by the Engineer, the contractor shall completely remove temporary structures, materials, equipment, and facilities installed by the Contractor. The Contractor shall repair any damage caused by the installation or use of the temporary facilities and shall cleanup all evidence of the temporary facilities after their proper removal.
- E. The contractor is responsible to keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.
- F. The contractor shall remove his temporary service and facility promptly when the need

for it or a substantial portion of it has ended, or when it has been replaced by the authorized use of a permanent facility.

- G. The contractor shall complete, or if necessary, restore permanent work which may have been delayed because of interference with the temporary service or facility. Repair damaged work, clean exposed surfaces and replace work which cannot be satisfactorily repaired.
- H. The contractor is responsible to operate and maintain his temporary services and facilities in good operating condition throughout the time of use and until removal is required. Protect from damage by freezing temperature and other environmental conditions.
- I. The contractor shall maintain distinct markers for underground lines. Protect from damage during excavating operations.

1.3 SERVICE UTILITIES

- A. The following temporary utility service may be required by the contractor on site to facilitate their construction:
 - 1. Temporary power and/or lighting
 - 2. Temporary water
 - 3. Temporary telephone or internet service
- B. All temporary utility service shall be installed per the utility company specifications and the contractor is responsible for paying all costs, service fees, obtaining all utility permit, approval, schedule for service, maintaining and disconnecting the service.
- C. The contractor shall provide a schedule for the temporary service to the Owner and Engineer.
- D. At completion of the work and prior to final acceptance by the Engineer, disconnect all temporary services to the satisfaction of the local authorities and utility companies

1.4 SANITARY FACILITIES

- A. The contractor shall provide, maintain and remove adequate portable toilet facilities for the use of all construction personnel, located conveniently to work stations. Temporary toilets shall be provided at a rate of one for each fifteen (15) persons, or fractional part thereof. Separate facilities for men and women shall be provided and labeled as required.
- B. All portable toilets shall have a holding tank and be regularly serviced to prevent sewage backup and maintain working condition.

1.5 DRINKING WATER

- A. The contractor shall provide potable drinking water dispensers, cups, waste receptacles, and miscellaneous supplies for the use of their own personnel and subcontractor located in the field office.

1.6 FIELD OFFICES AND STORAGE SHEDS

- A. The contractor is responsible to designate all staging areas based on their construction means and methods and provide a marked up plan using the project Storm Water and Pollution Prevention Plan as a guide to mark up and submit to the Owner and Engineer for approval.
- B. Each Prime Contractor shall provide a suitable ODOT Type A construction field office, tool, and material storage sheds for their own use. Field offices shall be set up so that on-site construction meetings can be held by the contractor, owner and engineer.
- C. The owner and engineer shall be allowed to sue field offices when needed.
- D. Sufficient material storage sheds with raised floors shall be provided for the storage and protection of products to be incorporated into the project. The Contractor shall provide heat and ventilation as required to maintain specified conditions for storage of products and to comply with applicable code requirements and regulations.
- E. Contractor's sheds or trailers shall have the company name and address printed on the sides.
- F. The location of such sheds shall be as approved by the Owner and Engineer.
- G. All field offices shall comply with all codes and safety regulations for fire and personal protection requirements. Each Contractor is to provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures. Minimum size is 15 lbs. In addition, it must comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

1.7 TEMPORARY PAVEMENT AND ROADS

- A. The contractor is required to provide a temporary construction entrance as shown on the project Storm Water Pollution Prevention Plans to allow for access into the site during all-weather conditions.
- B. The contractor is responsible to maintain traffic on all adjacent roads and sidewalks. Provide all flag persons, guards, and signs, all subject to the approval of the local authorities.
- C. Contractors using public or private roads to access the site must conform to all local regulations regarding load limits and use, including necessary permits. If the work of the Contractor requires that portions of the adjacent roads are needed to be closed, after obtaining the Engineer's approval, the work shall be done expeditiously and a detour route if needed shall be provided.
- D. All damage to public or private roads shall be repaired by the Contractor at their own cost and meet the requirements of the local municipality.
- E. All trucks or other vehicles leaving the site at any time shall be cleaned of mud and dirt clinging to wheels and exterior body surfaces.
- F. The contractor is responsible to sweep adjacent roads of mud and debris to keep the road clean to area residents.
- G. All trucks accessing the site or leaving shall have suitable coverings fastened over the load before they enter surrounding paved streets to prevent soil and/or material from spilling onto nearby roads.

- H. IF the contractor fails to keep the adjacent roads free of mud, debris etc. and at the direction of the engineer and the municipality a private sweeper may be called and the contractor will be billed and/or this cost deducted from their final payment.
- I. If sidewalks are located adjacent or in the project area the contractor shall install structurally adequate protective walkways designed and stamped by a structural engineer for safe passage way through the construction zone.

1.8 TEMPORARY PARKING

- A. The contractor shall provide temporary parking on site for construction works utilizing the same aggregate section as the construction entrance.

1.9 SIGNAGE

- A. The contractor shall install a sign at the construction entrance indicating the project area for material delivery.
- B. Sign to be cut from standard 4 ft. x 8 ft. weatherproof plywood sheet, or other suitable material. Upon completion of construction the contractor shall remove and dispose of signs.
- C. Contractor shall provide "Construction Entrance Ahead" warning signs along Ravenna Road 400 feet in advance of the construction entrance.

1.10 SITE SECURITY AND PROTECTION

- A. The contractor shall be responsible for all site security including storing and protecting all material and equipment from theft and/or vandalism.
- B. All work that has been installed or material that is stored shall be protected from construction activity and from unauthorized site personnel. Any damage to property, material and products installed shall be replaced by the contractor at their own cost.
- C. The contractor shall carry insurance for theft or vandalism of their equipment and material on site whether installed or stored. The Portage Parks District will not be held responsible for any damages that occurs.

1.11 COLLECTION AND DISPOSAL OF WASTE

- A. The contractor shall provide trash containers and hauling services for the project. The contractor is responsible to maintain a clean site with no trash left loose on-site.
- B. The contractor will be subjected to fines and/or portion of payment withheld for trash that is left loose and litters the adjacent parks property. The area will be cleaned for the Contractor and appropriate charges, including administrative mark-up and supervision costs, will be deducted from the monies due the Contractor failing to perform. This will be done at the time of the next payment request. The clean-up work is likely to be performed for the non-responsive Contractor outside of normal working hours. Premium labor costs will be included in the back charges.
- C. Burning or burying of waste materials on the site will not be permitted.
- D. Washing of waste materials down sewers or into waterways will not be permitted.
- E. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during

normal weather or 3 days when the temperature is expected to rise above 80 degrees F

1.12 CONSTRUCTION FENCE

- A. If shown on the Storm Water and Pollution Prevention Plans before construction begins the contractor shall install a general temporary enclosure fence. Locate where indicated on the Drawings. Install in a manner that will prevent people, pets and wild animals from easily entering the work area.

1.13 WORKER SAFETY

- A. Each Contractor shall take all necessary precautions for the safety of employees on the work and shall comply with all applicable provisions of Federal, State and Municipal Safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. The Contractors shall comply with all applicable provisions of the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America and IC-3 of the Industrial Commission of Ohio and also OSHA.
- B. The contractor shall provide a designated person who has a valid certificate in first aid training and a fully stocked first aid kit, OSHA compliant shall be maintained on the project site.
- C. Each contractor is required to ensure that his employees are not subject to noise, dust, and/or fume levels which exceed current OSHA standards. Each Contractor is to provide all necessary equipment required during the course of his work to prevent any damage or harm to personnel, structures, and/or the environment.
- D. The contractor shall furnish and install necessary barricades to protect the public and workmen during construction. Comply with recognized standards and code requirements for the erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public of the hazard being protected against. Provide lighting where appropriate and needed.
- E. Each Contractor is responsible for all required OSHA temporary protection and barricades necessary for the completion of his work. Temporary removal and reinstallation required for access is the responsibility of each Contractor requiring such access.
- F. The contractor shall prohibit smoking and enforce the smoking ban in hazardous fire exposure areas. Provide supervision of welding operations, combustion-type temporary eating units, and similar sources of possible fire.
- G. The contractor shall store combustible materials in containers in fire safe locations.

1.14 ENVIRONMENTAL PROTECTION

- A. The contractor shall provide and maintain during construction all Storm Water Pollution and Prevention measures as call for and shown on the project SWPPP plans must be implemented.
- B. The contractor shall provide earthen embankments or similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

- C. Store fuel in tanks equipped with containment tanks with 110% capacity of the storage tank.
- D. The contractor is responsible for all Storm Water Pollution Prevention inspections during construction and after rain events. All damaged or disturbed practices shall be removed and replaced at no additional costs to the Owner.

PART 2 – PRODUCTS

NOT USED

PART 2 – PRODUCTS

NOT USED

PART 4 – METHOD OF MEASUREMENT AND PAYMENT

NOT USED

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 2. Form: Tabulate information for each product under the following column headings:
 - a. Specification Section number and title.
 - b. Generic name used in the Contract Documents.
 - c. Proprietary name, model number, and similar designations.
 - d. Manufacturer's name and address.
 - e. Supplier's name and address.
 - f. Installer's name and address.
 - g. Projected delivery date or time span of delivery period.
 - h. Identification of items that require early submittal approval for scheduled delivery date.
 3. Initial Submittal: Within [10] days after date of commencement of the Work, submit [3] copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.
 4. Completed List: Within [30] days after date of commencement of the Work, submit [3] copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 5. Engineer's Action: Engineer will respond in writing to Contractor within [5] days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use form provided by Owner.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications

needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within [7] days of receipt of a request for substitution. Engineer will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within [15] days of receipt of request, or [7] days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
 - b. Use product specified if Engineer cannot make a decision on use of a proposed substitution within time allocated.
- C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within [15] days of receipt of request, or [7] days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
 - b. Use product specified if Engineer cannot make a decision on use of a comparable product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
 3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures"

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Engineer's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
 7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
 3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
 6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches.
 - a If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, and textures" or a similar phrase, select a product that complies with other specified requirements.
 - a Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 - b Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Engineer will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within [60] days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of

- other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.
 9. Requested substitution provides specified warranty.
 10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 COMPARABLE PRODUCTS

- A. Conditions: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of engineers and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/balance records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Advise Owner of changeover in heat and other utilities.
 - 12. Submit changeover information related to Owner's occupancy, use, operation, and

maintenance.

13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit [three] copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items

needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.

1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within [15] days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8.5x11 paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially

hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

- 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - O. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - S. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 01 74 23 - FINAL CLEANING

PART 1 - GENERAL

1.1 GENERAL

- A. On or before the completion date for the work, the Contractor shall tear down and remove all temporary structures built by him, all construction plant used by him, and shall repair and replace all parts of existing embankments, fences or other structures which were removed or injured by his operations or by the employees of the Contractor. The Contractor shall thoroughly clean out all buildings, sewers, drains, pipes, manholes, inlets and miscellaneous and appurtenant structures, and shall remove all rubbish leaving the grounds in a neat and satisfactory condition.
- B. As circumstances require and when ordered by the Engineer, the Contractor shall clean the road, driveway, and/or sidewalk on which construction activity under this contract has resulted in dirt or any other foreign material being deposited with an automatic self-contained mechanical sweeper with integral water spray, vacuum and on-board or supplementary containment.
- C. Failure to comply with this requirement when ordered by the Engineer or his representative, may serve as cause for the Engineer to stop the work and to withhold any monies due the Contractor until such order has been complied with to the satisfaction of the Engineer.
- D. As the work progresses, and as may be directed, the Contractor shall remove from the site and dispose of debris and waste material resulting from his work. Particular attention shall be given to minimizing any fire and safety hazard from form materials or from other combustibles as may be used in connection with the work, which should be removed daily.
- E. The Contractor shall wash all windows and other glass surfaces, leaving all areas free from putty marks, paint, etc.
- F. During and after installation, the Contractor shall furnish and maintain satisfactory protection to all equipment against injury by weather, flooding or breakage thereby permitting all work to be left in a new condition at the completion of the contract.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up Record Prints.
 - 2. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal: Submit one set of plots from corrected Record CAD Drawings and one set of marked-up Record Prints. Design Engineer will initial and date each plot and mark whether general scope of changes, additional information recorded, and quality of drafting are acceptable. Design Engineer will return plots and prints for organizing into sets, printing, binding, and final submittal.
 - b. Final Submittal: Submit one set of marked-up Record Prints, one set of Record Transparencies, and three (3) copies printed from Record Transparencies. Print each Drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.
 - 1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Work Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Design Engineer. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
 2. Refer instances of uncertainty to Architect for resolution.
 3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
 4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.
- C. Record CAD Drawings: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected CAD Drawings of the Contract Drawings, as follows:
1. Format: Same CAD program, version, and operating system as the original Contract Drawings.
 2. Format: [DWG], Version 2018, operating in [Microsoft Windows] operating system.
 3. Incorporate changes and additional information previously marked on Record Prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Architect for resolution.
 5. Architect will furnish Contractor one set of CAD Drawings of the Contract Drawings for use in recording information.
 - a. Design Engineer makes no representations as to the accuracy or completeness of CAD Drawings as they relate to the Contract Drawings.
 - b. CAD Software Program: The Contract Drawings are available in 2018 AutoCAD.
- D. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing Record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 2. Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared Record Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

- E. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
 3. Record CAD Drawings: Organize CAD information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each CAD file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Design Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in

manufacturer's written instructions for installation.

3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION

SECTION 03 00 00 - CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including form work, reinforcing, mix design, placement procedures and finishes.
 - 1. Extent of concrete work is shown on drawings.
 - 2. Concrete paving and walks are specified in Division 2.
 - 3. Precast concrete is specified in other Division 3 sections.
 - 4. Mechanical finishes and concrete floor toppings are specified in other Division 3 sections.

1.3 SUBMITTALS

- A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Engineer.
- B. Shop Drawings; Reinforcement: Submit original shop drawings prepared for fabrication, bending, and placement of concrete reinforcement. Comply with ACI Detailing Manual showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- C. Shop Drawings; Form work: Submit shop drawings prepared by a registered Professional Engineer for fabrication and erection of forms for specific finished concrete surfaces. Show form construction including jointing, special form joint or reveals, location and pattern of form tie placement, and other items which affect exposed concrete visually.
 - 1. Engineer's review is for general architectural applications and features only. Design of form work for structural stability and efficiency is Contractor's responsibility.
- D. Samples: Submit samples of materials as requested by Engineer, including names, sources, and descriptions.

- E. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design tests.
1. The proposed mix design submittal(s) shall follow the procedures of Chapter 5, Sections 5.2 to 5.3 of ACI-318.
 2. Reference should be made to ACI-211.SR "Guide for Submittal of Concrete Proportions" for the required submittal information. Sample forms for presenting the necessary information can be found in the addendum at the end of this section. Example Form B should follow a completed Example A in the submittal when laboratory trial batches are used to document a water-cementitious materials ratio curve.
 3. Additional data summarizing the past performance records should be an integral part of the submittal if the submittal is based on past performance with the proposed materials and proportions.
- F. Materials Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Engineer. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, latest revisions, except where more stringent requirements are shown or specified:
1. ACI 301 "Specifications for Structural Concrete for Buildings."
 2. ACI 318 "Building Code Requirements for Reinforced Concrete."
 3. Concrete Reinforcing Steel Institute (CRSI), "Manual of Standard Practice."
 4. ACI 347 "Guide to Form work for Concrete."
 5. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- B. Materials and installed work may require testing and retesting at any time during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.
- C. Engage a testing agency acceptable to Engineer to perform initial material evaluation and certification tests for mix designs and to design concrete mixes.
- D. Mockup: Cast mockup of size indicated or as required to demonstrate typical joints, form tie spacing, and proposed surface finish, texture, and color. Maintain sample panel exposed to view for duration of project, after Engineer's acceptance of visual qualities.
1. Demolish mockup and remove from site when directed by Engineer.

- E. Preinstallation Conference: Conduct conference at project site to comply with requirements of Division 1 Section "Project Meetings" and the following:
1. At least 35 days prior to submitting design mixes, conduct a meeting to review detailed requirements for preparing concrete design mixes and to determine procedures for satisfactory concrete operations. Review requirements for submittals, status of coordinating work, and availability of materials. Establish preliminary work progress schedule and procedures for materials, inspection, testing and certifications. Require representatives of each entity directly concerned with cast-in-place concrete to attend conference, including, but not limited to, the following:
 - a. Contractor's Superintendent
 - b. Agency responsible for concrete design mixes.
 - c. Agency responsible for field quality control.
 - d. Ready-mix concrete producer.
 - e. Concrete Subcontractor
 - f. Primary admixture manufactures.

1.5 PROJECT CONDITIONS

- A. Protection of Footings against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent subgrade against possibility of freezing; maintain cover for time period as necessary.
- B. Protect adjacent finish materials against spatter during concrete placement.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.
 1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.
- B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least two (2) edges and one side for tight fit.
- C. Forms for Textured Finish Concrete: Units of face design, size, arrangement, and configuration to match Engineer's control sample. Provide solid backing and form supports to ensure stability of textured form liners.

- D. Forms for Cylindrical Columns and Supports: Metal, fiberglass reinforced plastic, or paper or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.
- E. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.
- F. Form Ties: Factory-fabricated, adjustable-length, snap off metal or glass fiber-reinforced plastic form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to the exposed surface.
 - 1. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.
 - 2. All form ties shall have a factor of safety of two (2) to determine the recommended safe working load.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Galvanized Reinforcing Bars: ASTM A 767, Class II (2.0 oz. zinc psf) hot-dip galvanized, after fabrication and bending.
- C. Epoxy-Coated Reinforcing Bars: ASTM A 775.
 - 1. Repair of damaged epoxy-coating - When required, damaged epoxy-coating shall be repaired with patching material conforming to ASTM A 775. Repair shall be done in accordance with the patching material manufacturer's recommendations.
- D. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- E. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. (Flat sheets only)
- F. Welded Deformed Steel Wire Fabric: ASTM A 497.
- G. Epoxy - Coated Welded Wire Fabric: ASTM A884, Class A.
- H. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I, II or I/II and ASTM C595M, Type IP, unless otherwise specified. (See Table I, Concrete Requirements).
 - 1. Use one brand of cement throughout project, unless otherwise acceptable to Engineer.
- B. Fly Ash: ASTM C 618, Class F.
- C. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
 - 1. Limit use of fly ash to not exceed 25% of cement content by weight.
 - 2. Limit use of granulated blast-furnace slag to not exceed 30% of cement content by weight.
- D. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete, with nominal maximum aggregate size of 1 inch.
 - 1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
 - 2. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Engineer.
 - 3. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 (0.3-mm) sieve, and less than 8 percent may be retained on sieves finer than No. 50 (0.3 mm).
- E. Lightweight Aggregates: ASTM C 330.

Maximum nominal aggregate size of 1 inch.
- F. Water: Drinkable and complying with ASTM C94.
- G. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- H. Chemical Admixtures: Chemical admixtures as defined by ASTM C 494 and containing not more than 0.1 percent chloride ions including:
 - Type A - Water Reducing
 - Type B - Retarding
 - Type C - Accelerating
 - Type D - Water Reducing and Retarding
 - Type E - Water Reducing and Accelerating
 - Type F - High-Range Water-Reducing (Super Plasticizer)
 - Type G - High-Range Water-Reducing and Retarding

- I. Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
- J. Prohibited Admixtures:

Calcium chloride thiocyanates or admixtures containing more than 0.1 percent chloride ions are not permitted.
- K. Fiber Reinforcement:
 - 1. Synthetic fiber reinforcing shall be added to the concrete for the areas so indicated in the drawings. Only fibers designed and manufactured specifically for use in concrete shall be acceptable as secondary reinforcement, complying with ASTM C1116, not less than 3/4 inch long.
 - 2. The fibers may be added at the batch plant. The incorporation of said fibers shall be documented on the delivery ticket from the ready mix producer. Fibers shall be added to the concrete in strict accordance with manufacturer's printed instructions. The minimum dosage rate shall be 1.5 lbs/cubic yard.
 - 3. Nylon fibers containing 1009a virgin nylon monofilaments shall be utilized to impart a "non-hairy" surface to the finished concrete.

2.4 RELATED MATERIALS

- A. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gage galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. Waterstops: Provide waterstops at construction joints and other joints as indicated and specified in Section 03255CT.
- C. Granular Base: Evenly graded mixture of fine and coarse aggregates to provide, when compacted, a smooth and even surface below slabs on grade.
- D. Vapor Retarder: Provide vapor retarder cover, ASTM E1745 Class C, over prepared base material where indicated below slabs on grade. Use only materials which are resistant to deterioration when tested in accordance with ASTM E 154, as follows:
 - 1. Polyethylene sheet not less than 10 mils thick.
 - 2. Water resistant barrier paper consisting of heavy Kraft papers laminated together with glass fiber reinforcement and over-coated with black polyethylene on each side.
- E. Non-Shrink Grout: CRD-C 621 and ASTM C-1107, factory pre-mixed grout and Non-metallic.
- F. Non-slip Aggregate Finish: Provide fused aluminum oxide grits, or crushed emery, as abrasive aggregate for non-slip finish with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide. Use material that is

factory-graded, packaged, rust-proof, and non-glazing, and is unaffected by freezing, moisture, and cleaning materials.

- G. Colored Wear-Resistant Finish: Packaged, dry, combination of materials, consisting of Portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground, non-fading mineral oxides, interground with cement. Color as selected by Engineer, unless otherwise indicated.
- H. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- I. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
 - 1. Waterproof paper.
 - 2. Polyethylene film.
 - 3. Polyethylene-coated burlap.
- J. Liquid Membrane-Forming Curing Compound: Liquid type membrane- forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg./sq. m. when applied at 200 sq ft./gal.
- K. Underlayment Compound: Freeflowing, self-leveling, pumpable cementitious base compound for applications from 1 inch thick to feathered edges.
- L. Bonding Compound: Polyvinyl acetate or acrylic base.
 - a. Polyvinyl Acetate (Interior Only):
 - b. Acrylic or Styrene Butadiene:
- M. Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type," "Grade," and "Class" to suit project requirements.

2.5 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301 and ACI 211. If the trial batch method is used, use an independent testing facility acceptable to Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Engineer.
 - 1. Limit use of fly ash to not exceed 25 percent of cement content by weight.
- B. Submit written reports to Engineer and Structural Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Engineer.

- C. Design mixes to provide normal weight concrete with the following properties, as indicated in Table I.:

TABLE 1

CONCRETE REQUIREMENTS

Concrete <u>Class</u>	Cement <u>Type</u>	Min. 28-Day Compressive Strength PSI	*Max. Water- Cement <u>Ratio</u>	Min. Cement Content <u>Sacks</u>	Slump <u>Min.</u>	Inch <u>Max.</u>	Entrained <u>Air %</u>
A	1	4000	0.45	6	-	-	6J1
B	1	2000	0.74	4-1/2	2	6	5+-1/2
C	1	4000	0.50	6.38	1	4	6J2
D	11 or IP	4000	0.45	6	-	-	6J1

* Maximum Water - Cementitious Materials Ratio

1. All reinforced concrete shall be Class A, except as otherwise specified or shown on the drawings.
2. Concrete used for mud mats, fill and channeling in manholes and chambers shall be Class B unless otherwise noted on the drawings.
3. Class C concrete shall be used for all concrete pavement, curbing, driveways, and sidewalks, unless noted otherwise on the drawings.
4. Class B concrete may be used for encasing pipelines, fill, and pipe bedding.
5. Class B concrete shall be used as concrete fill in concrete tanks for shaping or sloping bottoms.

a. The following steps shall be taken for installation of the Class B concrete:

- 1) Scrub concrete slabs and/or walls with a stiff wire brush and streams of clean water as a minimum, to remove laitance.
- 2) Apply a bonding agent in accordance with the manufacturer's surface preparation and application recommendations.
- 3) The Class B concrete shall then be placed and screeded to bring the surface to final grade.

6. Class D concrete shall be used for sewerage treatment plants and sewerage pump stations, as noted on the drawings.

- D. Lightweight Concrete: Lightweight aggregate and concrete shall conform to ASTM C 330. Proportion mix to produce concrete with a minimum compressive strength of 3000 psi at 28 days and a calculated equilibrium unit weight of 110 pcf plus or minus 3 pcf as determined by ASTM C 567. Concrete slump at the point of placement shall be the minimum necessary for efficient mixing, placing, and finishing. Maximum slump shall be 6 inches for pumped concrete and 5 inches elsewhere. Air entrain concrete exposed to weather according to ACI 301 requirements.

- E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Engineer before using in work.
- F. Admixtures:
1. Use high range water-reducing admixture (super plasticizer) in Classes A and D concrete unless noted otherwise.
 2. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg F (10 deg C).
 3. 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 within limits shown in Table I.
 4. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.
 5. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as shown in Table I:
 - a. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.

2.6 CONCRETE MIXING

- A. Job-Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof.
1. Provide batch ticket for each batch discharged and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.
- B. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.
1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
 - a. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials and vapor retarders with placement of forms and reinforcing steel.

3.2 FORMS

- A. Design, erect, support, brace, and maintain form work to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct form work so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain form work construction tolerances complying with ACI347.
- B. Design form work to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.
- D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of form work is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.
- F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Provisions for Other Trades: Provide openings in concrete form work to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- H. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement if required to eliminate mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDER INSTALLATION

- A. Following leveling and tamping of granular base for slabs on grade, place vapor retarder sheeting with longest dimension parallel with direction of pour.
- B. Lap joints 6" and seal with manufacturers recommended mastic or pressure-sensitive tape.

3.4 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified.
 - 1. Avoiding cutting or puncturing vapor retarder during reinforcement placement and concreting operations. Repair damages before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement by form work, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in longest lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- F. Epoxy - Coated Reinforcing Steel:
 - 1. Epoxy-coated reinforcing bars supported from form work shall rest on coated wire bar supports, or on bar supports made of dielectric material or other acceptable materials. Wire bar supports shall be coated with dielectric material for a minimum distance of 2 inches from the point of contact with the epoxy-coated reinforcing bars. Reinforcing bars used as support bars shall be epoxy-coated.
In walls having epoxy-coated reinforcing bars, spreader bars where specified by the Engineer, shall be epoxy-coated. Proprietary combination bar clips and spreaders used in walls with epoxy-coated reinforcing bars shall be made of corrosion-resistant material.
 - 2. Epoxy-coated reinforcing bars - Equipment for handling epoxy-coated bars shall have protected contact areas. Bundles of coated bars shall be lifted at multiple pick-up points to minimize bar-to-bar abrasion from sags in the bundles. Coated bars or bundles of coated bars shall not be dropped or dragged. Coated bars shall be stored on protective cribbing. Fading of the color of the coating shall not be cause for rejection of epoxy-coated reinforcing bars. Coating damage due to handling,

shipment and placing need not be repaired in cases where the damaged area is 0.1 square inches or smaller. Damaged areas larger than 0.1 square inches shall be repaired in accordance with the epoxy material manufacturer's recommendations. The maximum amount of damage including repaired and unrepaired areas shall not exceed 2 percent of the surface area in each linear foot of each bar.

3.5 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Engineer.
 - 1. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
 - 2. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.
- B. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions.
- C. Isolation Joints in Slabs-on-Ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated.
 - 1. Joint filler and sealant materials are specified in Section 03255CT of these specifications.
- D. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use inserts 1/4 of slab depth, unless otherwise indicated.
 - 1. Form contraction joints by inserting premolded plastic strips into fresh concrete until top surface of strip is flush with slab surface.
 - 2. Follow the directions of Insert Manufacturer for finishing the slab and joints.
- E. If joint pattern not shown, provide joints not exceeding 15' in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third-bays).
 - 1. Joint sealant material is specified in Section 03255CT of these specifications.

3.6 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting

drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto. Electrical conduit shall not be embedded in concrete.

- B. Install reglets to receive top edge of foundation sheet waterproofing, and to receive thru-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
- C. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

3.7 PREPARATION OF FORM SURFACES

- A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.
- B. Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.
- C. Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel form work is not acceptable.

3.8 CONCRETE PLACEMENT

- A. Preplacement Inspection: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
 - 1. Apply temporary protective covering to lower 2' of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as herein specified.
 - 1. 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 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.

- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 2. 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.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 3. Maintain reinforcing in proper position on chairs during concrete placement operations.
- E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
1. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C), and not more than 80 deg F (27 deg C) at point of placement.
 - a. The concrete shall be maintained within this temperature range for not less than seven (7) days.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials or against cold reinforcing steel.
 3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- F. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.
2. 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. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Engineers.

3.9 FINISH OF FORMED SURFACES

- A. Rough Form Finish: For formed concrete surfaces not exposed-to- view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is an as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed; provide smooth rubbed finish to smooth form finish. Refer to "Concrete Surface Repairs."
- C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment.
 1. Scarify or roughen entire surface by grinding or similar effective means.
 2. Combined one part Portland cement to 1-1/2 parts fine sand by volume and a 50:50 mixture of acrylic or styrene butadiene-based bonding admixture and water to form the consistency of thick paint. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.
 3. Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
 4. Repeat the above process if necessary to fill voids or bug holes and obtain a consistent match to adjacent surfaces, subject to acceptance of the Engineer.
- D. Grout Cleaned Finish: Provide grout cleaned finish on scheduled concrete surfaces which have received smooth form finish treatment.

1. Scarify or roughen entire surface by grinding or similar effective means.
 2. Apply Thoroseal plaster mix coating by Thoro System Products or approved equivalent with an approximate thickness of 1/8-inch to 1/4-inch.
 3. Follow the manufacturer's recommendations and guidelines regarding surface preparation, application methods and curing.
 4. Repeat the above process if necessary to fill voids or bug holes and obtain a consistent match to adjacent surfaces, subject to acceptance of the Engineer.
- E. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
1. After placing slabs, plane surface to tolerances for floor flatness F (F) 15 and floor levelness F (L) 13, measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.
1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both, Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of F(F) 18 F(L) 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- C. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating system.
1. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of F (F), 20 and F (L) 17, measured according to ASTM E1155. Grind smooth surface defects which would telegraph through applied floor covering system.

- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.
- F. Non-slip Aggregate Finish: Apply non-slip aggregate finish to concrete stair treads, platforms, ramps, sloped walks, and elsewhere as indicated.
 - 1. After completion of float finishing, and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as herein specified.
 - 2. After curing, lightly work surface with a steel wire brush, or an abrasive stone, and water to expose non-slip aggregate.
- G. Colored Wear-Resistant Finish: Provide colored wear-resistant finish to monolithic slab surface indicated.
 - 1. Apply dry shake materials for colored wear-resistant finish at rate of not less than 100 lbs. per 100 sq. ft., unless greater amount is recommended by material manufacturer.
 - 2. Immediately following first floating operation, uniformly distribute approximately 2/3 of required weight of dry shake material over concrete surface, and embed by means of power floating. Follow floating operation with second shake application, uniformly distributing remainder of dry shake material with overlapping applications, and embed by power floating.
 - 3. After completion of broadcasting and floating, apply trowel finish as herein specified. Cure slab surface with curing compound recommended by dry shake hardener manufacturer. Apply curing compound immediately after final finishing.

3.11 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete from rapid moisture loss before and during finishing operations.
 - 1. The evaporation graph, Figure 1, of ACI 308 - Curing Concrete, shall be used to determine the evaporation rate during concrete placement. If the rate of evaporation equals or exceeds 0.2 lbs/sq.ft./hr., steps shall be taken to prevent excessive evaporation from the surface.
 - 2. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.

- a. Initial curing may be any of the methods listed herein that maintain a satisfactory moisture content and temperature.
 3. Begin final curing procedures, if they differ from initial curing, immediately following initial curing and before concrete has dried. Continue curing for at least seven (7) days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Perform curing of all structural concrete as herein specified.
 1. Provide moisture curing by following methods.
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Continuous water-fog spray.
 - c. Cover concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
 2. Provide moisture-cover curing as follows:
 - a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- C. Provide curing and sealing compound to pavement, walks, and curbs only, as follows:
 1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours) and after surface water sheen has disappeared. Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.
- D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- E. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by moist curing methods.
 1. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.12 SHORES AND SUPPORTS

- A. Comply with ACI 347 for shoring and reshoring in multistory construction, and as herein specified.
- B. Extend shoring from ground to roof for structures four (4) stories or less, unless otherwise permitted.
- C. Extend shoring at least three (3) floors under floor or roof being placed for structures over four (4) stories. Shore floor directly under floor or roof being placed, so that loads from construction above will transfer directly to these shores. Space shoring in stories below this level in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.
- D. Remove shores and reshore in a planned sequence to avoid damage to partially cured concrete. Locate and provide adequate reshoring to safely support work without excessive stress or deflection.
 - 1. Keep reshores in place a minimum of 15 days after placing upper tier, and longer if required, until concrete has attained its required 28-day strength and heavy loads due to construction operations have been removed.

3.13 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for five (5) days after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members. Lab cured cylinders will not be considered.
- C. Form facing material may be removed five (5) days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.14 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new form work.

- B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Engineer.

3.15 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment with template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
 - 1. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads and landings and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and finish concrete surfaces as scheduled. Cure concrete as herein specified.
- E. Reinforced Masonry: Provide concrete grout conforming to ASTM C476 for reinforced masonry lintels and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

3.16 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Engineer.
 - 1. Saw-cut out honeycomb, rock pockets, voids over 1/4" in any dimension, down to solid concrete but, in no case to a depth of less than 1." Make edges of cuts slightly undercut to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
 - 2. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

B. 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 Portland Cement patching mortar, or precast cement cone plugs secured in place with bonding agent. When other materials are used, apply them in accordance with manufacturer's recommendations.

1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
2. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane 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. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include 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.
4. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
5. 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 Engineer.
6. 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 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply 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.
7. 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 Portland cement to 2-1/2 parts fine aggregate passing a 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.
8. Perform structural repairs with prior approval of Engineer or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.
9. Repair methods not specified above may be used, subject to acceptance of Engineer.
10. Underlayment Application: Leveling of floors for subsequent finishes may be achieved by use of specified underlayment material.

3.17 THROUGH SECTION CONCRETE CRACK REPAIRS

A. Sealing through wall or slab cracks.

1. Seal cracks for a water-tight or structurally bonded repair with epoxy or chemical grouting procedures.
 - a. The Contractor shall make proper repairs with epoxy injection or chemical injection with a moisture reactive hydrophilic polyurethane foam grout, as directed by the Engineer.

3.18 MUD MATS

- #### A. Where called for on the plans or as directed by the Engineer, the Contractor shall construct concrete mud mats immediately after cleaning the excavation bottom, to preserve the bearing surface condition. Concrete for mud mats shall be not less than 3 in. thick. Bottom of excavation shall be free of water, mud and loose material prior to mud mat placement. See Section 02300CT.
1. Mud mat concrete shall be cast against the side walls of all excavations to completely seal the bottom.

ADDENDUM
EXAMPLE FORM A

CONCRETE SUPPLIER: _____

PROJECT: _____ CONTRACTOR: _____

MIXTURE ID: _____ SPECIFIED fic: _____ PSI

MATERIAL MIXTURE PROPORTIONS lbs-mass/cu.yd. (pcy)

1.0 Cement Type _____ Source: _____

Sp. Gr. _____ pcy _____ cu. ft.

1.1 Other Cementitious Materials: _____ Class: _____ Source: _____

Sp. Gr. _____ pcy _____ cu. ft.

2.0 Aggregate (No. 1) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ pcf

Alternate (No. 1) Lightweight Aggregate Type: _____ Size: _____ Source: _____

Sp. Gr. Factor _____ over dry pcy _____ cu. ft.

Loose Unit Wt. _____ pcf Estimated Wet _____ pcf

2.1 Aggregate (No. 2) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ pcf (If Fine Sized - FM _____)

2.2 Aggregate (Nos. 3, 4, n) Type: _____ Size: _____ Source: _____

SSD Sp. Gr. _____ pcy _____ cu. ft.

Dry Rodded Unit Wt.: _____ Pcr

3.0 Water: _____ gal. _____ pcy _____ cu. ft.

EXAMPLE FORM A (CONTINUED)

4.0 Admixtures expressed as fluid ounces/cubic yard, and estimated range

Source: _____ Name : _____ Type _____ oz

Source: _____ Name : _____ Type _____ oz

Source: _____ Name : _____ Type _____ oz

Total Admixture Liquid Vol. _____ cu. ft.

(*) Note: Show volume in 4.0 if not included in cubic feet of air or water.

5.0 Other Materials - fibers, color pigment or other additions

Sp. Gr. _____ pcy _____ cu. ft.

Total Mixture Mass and Volume: _____ pcy _____ cu. ft.

Fresh Concrete Properties

Coarse & Fine Aggregate Gradation

Percent Passing

Slump _____ +/- _____ in.	Sieve Size	Aggregate No.				
		1	2	3	4	Combined
Unit Weight _____ pcf	2 in.	_____	_____	_____	_____	_____
Air Content _____ +/- _____ %	1-1/2 in.	_____	_____	_____	_____	_____
	1 in.	_____	_____	_____	_____	_____
	3/4 in.	_____	_____	_____	_____	_____
	1/2 in.	_____	_____	_____	_____	_____
If Trail Batch Data -	3/8 in.	_____	_____	_____	_____	_____
Identify Batch No. _____	No. 4	_____	_____	_____	_____	_____
Batch Date _____	No. 8	_____	_____	_____	_____	_____
Concrete Temp. _____ °F	No. 16	_____	_____	_____	_____	_____
Comp. Strength-Average _____ °F	No. 30	_____	_____	_____	_____	_____

EXAMPLE FORM A (CONTINUED)

7 day avg. _____ psi	No. 50	_____	_____	_____	_____	_____
28 day avg. _____ psi	No. 100	_____	_____	_____	_____	_____
	No. 200	_____	_____	_____	_____	_____

Comments: _____

Signature: _____ Date: _____

Title: _____

Organization: _____

EXAMPLE FORM B

CONCRETE SUPPLIER: _____

MATERIAL TRAIL BATCH NUMBER - proportions per cubic yard

1 2 3 4

1.0 Cement Source: _____

Type _____ _____lb _____lb _____lb
_____lb

1.1 Other Cementitious Material Sources: _____

Type _____ _____lb _____lb _____lb _____lb

2.0 Aggregate No. 1 Size _____ Source: _____

SSD _____ _____lb _____lb _____lb
_____lb

Alternate No. 1 Lightweight Aggregates Type _____ Source: _____

Sp. Gr. Factor _____

Oven Dry _____lb _____lb _____lb _____lb

Wet _____lb _____lb _____lb _____lb

2.1 Aggregate No. 2 Size _____ Source: _____

SSD _____ _____lb _____lb _____lb
_____lb

2.2 Aggregate Nos. 3, 4, n) Size _____ Source: _____

SSD _____ _____lb _____lb _____lb
_____lb

3.0 Water _____lb _____lb _____lb _____lb

4.0 Admixtures Source: _____

_____ Type _____oz _____oz _____oz _____oz

_____ Type _____oz _____oz _____oz _____oz

_____Type_____0Z _____0Z _____0Z _____0Z

EXAMPLE FORM B (CONTINUED)

5.0 Other Materials

_____ Type _____ lb _____ lb _____ lb _____ lb

Total Mass: _____ lb _____ lb _____ lb _____ lb

Total Mass/cy: _____ pcy _____ pcy _____ pcy _____ pcy

Relative Cubic Yard Volume:
_____ cy _____ cy _____ cy _____ cy

Water-Cementitious Material Ratio:

Fresh Concrete Properties

TRAIL BATCH NUMBER

	<u>##-1</u>	<u>##-2</u>	<u>##-3</u>	<u>##-4</u>
Slump-inches				Air-
Content 9r	_____	_____	_____	_____
Unit Wt. pcf	_____	_____	_____	_____
Concrete Temp. °F	_____	_____	_____	_____
Compressive Strength Results (ASTM C192, C39) or Other Specified Test Requirements				
7 days	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
Average (7 day)	_____	_____	_____	_____

EXAMPLE FORM B (CONTINUED)

28 days

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Average (28 day)

_____	_____	_____	_____
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Water-Cementitious Material Ratio:

_____	_____	_____	_____
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Signature: _____ Date: _____

Title: _____

Organization: _____

END OF SECTION

SECTION 31 00 00 - EARTHWORK

Part 1

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PART 1 GENERAL

1.1 SUMMARY

- A. Work covered by this Section shall include all excavation, trenching and related work for the construction of the designated structures and pipelines, backfill and other incidental work
- B. The Work covered by this Section consists of:
 - 1. making all necessary excavations for the construction of all Work;
 - 2. preparing subgrade for foundations, slabs, walks, and pavements;
 - 3. doing all pumping, fluming, and dewatering necessary to keep the trenches and other excavation free from water;
 - 4. providing for uninterrupted flow of existing drains and sewers, and the disposal of water from any sources during the progress of the Work;
 - 5. supporting and protecting all trench walls, structures, pipes, conduits, culverts, posts, poles, wires, fences, buildings and other public and private property adjacent to the Work;
 - 6. removing and replacing existing sewers, culverts, pipelines and bulkheads where necessary;
 - 7. removing after completion of the Work all sheeting and shoring or other soil support materials not necessary to support the sides of trenches;
 - 8. removing and disposing all surplus excavated material;
 - 9. doing all backfilling and grading, of compacting backfill to limits specified or ordered by the Engineer;
 - 10. restoring all property damaged as a result of the Work involved in this Contract.
- C. The Work includes transporting surplus excavated materials not needed for backfill at the location where the excavation is made, to other parts of the Work where filling is required, and disposal of all types of surplus material off the site.
- D. The Work includes:
 - 1. constructing a structure of soil or granular material in layers to a predetermined elevation and cross section;
 - 2. supporting and protecting all structures, pipes, conduits, culverts, posts, poles, wires, fences, buildings and other public and private property adjacent to the Work;
 - 3. placing all fill and performing rough grading;
 - 4. compacting fill to limits specified or ordered by the Engineer;
 - 5. restoring all property damaged as a result of the Work involved in this Contract.
- E. The Work includes low strength mortar backfill material intended for use in backfilling as shown on the Drawings.

1.3 DEFINITIONS

- A. Backfill: Soil or granular materials used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, not including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding: Layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow: Satisfactory soil imported for use as fill or backfill.
- D. Excavation: Removal and disposal of material encountered above subgrade or foundation elevations.
 - 1. Additional Excavation: Excavation below subgrade or foundation elevations as directed by Engineer.
 - 2. Trench: Narrow linear excavation
 - 3. Unauthorized Excavation: Excavation below subgrade or foundation elevations or beyond indicated dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.
 - 4. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface or subsurface conditions encountered, including rock, soil materials and obstructions.
- E. Embankment: A structure consisting of soil, granular material, shale, rock, or other approved material, constructed in layers to a predetermined elevation and cross-section.
- F. Granular materials: Natural aggregate, such as broken or crushed rock, gravel, or sand that can be readily incorporated into an 8-inch layer, and in which at least 65% by weight of the grains or particles are retained in a No. 200 sieve.
- G. Laboratory Dry Weight: The maximum laboratory dry weight shall be the weight provided by the laboratory when the sample is tested in accordance with ASTM D-698 Method A, C, or D.
- H. Optimum Moisture: The water content at which the maximum density is produced in a soil by a given compaction effort (ASTM D-698).

- I. Pavement Prism: Also referred to as the zone of influence. The area below a line drawn 45 degrees to the horizontal from the surface at the edge of pavement, sidewalk or curb.
- J. Pipe Embedment: The material placed in a trench surrounding a pipe or conduit consisting of the foundation, bedding, haunching, and initial backfill.
- K. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material one (1) cu. yd. or more in volume that when tested by an independent geotechnical testing agency, according to ASTM D 1586, exceeds a standard penetration resistance of 100 blows/2 inches.
- L. Shale: Laminated material, formed by the consolidation in nature of soil, having a finely stratified structure. For the purpose of these specifications, the following bedrock types shall also be considered shale: mudstone, claystone, siltstone and hard clay.
- M. Soil: All earth materials, organic or inorganic, which have resulted from natural processes such as weathering, decay, and chemical reaction.
- N. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, pavement, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- O. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage course, or topsoil materials.
- P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

- A. Comply with all provisions of Section, Shop Drawings and Submittals.
- B. Product Data: For the following:
 - 1. Source-locations of all materials shall be identified to the Engineer.
 - 2. Source quality laboratory test of all fill materials as required to show compliance with material specifications.
- C. Shop Drawings: Submit information for the following items:

1. Sheeting and bracing (*prepared and stamped by a professional engineer, registered in the State of Ohio*).
2. Dewatering system and standby equipment (*prepared and stamped by a professional engineer, registered in the State of Ohio*).
3. Cofferdams (*prepared and stamped by a professional engineer, registered in the State of Ohio*).
4. Protection methods anticipated (*prepared and stamped by a professional engineer, registered in the State of Ohio*).
5. Underpinning (*prepared and stamped by a professional engineer, registered in the State of Ohio*).
6. Excavation procedures (*prepared and stamped by a professional engineer, registered in the State of Ohio*).

1.5 REFERENCES

- A. AASHTO M 43 Standard Specification for Size of Aggregate for Road and Bridge Construction
- B. ASTM C-150 Standard Specification for Portland Cement
- C. ASTM C-618 Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
- D. ASTM D-698 Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5-lb (2.49-kg) Rammer and 12-in. (305-mm) Drop
- E. ASTM D-1586 Standard Method for Penetration Test and Split-Barrel Sampling of Soils
- F. ASTM D-2487 Standard Test Method for Classification of Soils for Engineering Purposes
- G. ASTM D-2940 Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports
- H. ASTM D-4253 Standard Test Method for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table
- I. ASTM D-4254 Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density

- J. State of Ohio - Department of Transportation - Construction and Material Specifications, Item 304, Aggregate Base.
- K. State of Ohio - Department of Transportation - Construction and Material Specifications, Material Detail 703.16, Suitable Materials for Embankment Construction.
- L. State of Ohio - Department of Transportation - Construction and Material Specifications, Material Detail 703.02.A.2, Fine Aggregate for Portland Cement Concrete

1.6 QUALITY ASSURANCE

- A. Qualifications
- B. Regulatory Requirements
- C. Certifications
- D. Field Samples
- E. Mock-ups
- F. Pre-Construction Conference

1.7 PROJECT CONDITIONS

- A. Environmental Requirements
- B. Existing Conditions
 - 1. Existing ground elevations of the site are shown by figures and/or by contours on the Drawings. The contours and elevations of the present ground are believed to be reasonably correct, but do not purport to be absolutely so, and, together with any schedule of quantities, are presented only as an approximation. The Contractor shall satisfy himself, however, by actual examination on the site of the Work, as to the existing elevations and contours, and the amount of work required.

- C. Existing Utilities
 - 1. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and then only after arranging to provide temporary utility services according to requirements indicated.
 - 2. Notify Engineer not less than two days in advance of proposed utility interruptions.
 - 3. Do not proceed with utility interruptions without Engineer's written permission.
 - 4. Contact utility-locator service for area where Project is located before excavating.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to the site, store and protect under provisions of Section T, Product Handling and Protection.
- B. Comply with all provisions of Section, Environmental Protection.

1.10 PROHIBITION OF EXPLOSIVES

- A. The use of explosives is not permitted.

1.11 FIELD MEASUREMENTS

- A. The Contract Drawings may indicate locations where certain utilities, structures or facilities might possibly interfere with the installation of new improvements. The Contractor shall dig such exploratory test pits as may be necessary to determine the exact location and elevation of the indicated subsurface structure and shall make acceptable provision for their protection, support and maintenance in operation. The Engineer shall be provided advance notification when and where excavation for test pits will take place. The Contractor shall provide the Engineer a record of field locations of all listed utilities, structures or facilities a minimum of five (5) days prior to initiating construction of the project. Locations and elevations are to be provided by a Surveyor registered in the State of Ohio.

PART 2 PRODUCTS

2.1 GRANULAR PIPE EMBEDMENT

- A. Crushed gravel or crushed limestone meeting AASHTO M 43 gradations shall be used for bedding, haunching, and initial backfill as shown on the Drawings.

2.2 SAND PIPE EMBEDMENT

- A. Fine aggregate consisting of natural sand meeting the gradation requirements of ODOT Item 703.02.A.2 or shown on the Drawings. The material shall not be lumpy or frozen, and shall be free from slag, cinders, ashes, rubbish, and other deleterious or objectionable material. Sand shall not contain a total of more than 10% by weight of loam and clay.

2.3 ONSITE BACKFILL

- A. Excavated soil material, capable of meeting specified compaction, and approved by the Engineer for use as backfill in designated locations.
- B. Based upon subsurface investigation, the Owner does not guarantee the onsite soils in its present state consists of the proper moisture content to achieve the specified compaction without drying or adding water.
- C. Unsuitable Backfill Material
 - 1. Onsite materials that are unsuitable for backfill, unless otherwise specifically shown in the Drawings, include rock or other materials greater than six (6) inches in their largest dimension, pavement, rubbish, debris, wood, metal, plastic, frozen earth, and the following soils classified per ASTM D-2487:

Symbol	Description
OL	Organic silts and organic silty clays of low plasticity
MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
CH	Inorganic clays of high plasticity, fat clays
OH	Organic clays of medium to high plasticity
PT	Peat, muck, and other highly organic soils

2.4 SPECIAL BACKFILL MATERIAL (ODOT Item 304)

- A. Special backfill material shall meet the gradation requirements of ODOT Item 304 and shall consist of crushed gravel or crushed limestone in combination with natural sand or stone. The aggregate shall meet the following gradation requirements:

<u>Sieve</u>	<u>Total Percent Passing</u>
2 inch	100
1 inch	70-100
$\frac{3}{4}$ inch	50-90
No. 4	30-60
No. 30	9-33
No. 200	0-15

2.5 LOW STRENGTH MORTAR BACKFILL

- A. Low Strength Mortar shall comply with ODOT Item 613.
- B. Submit test data that demonstrates that the proposed mix has a strength of 50 to 100 PSI at 28 days.
- C. Each load shall be tested with 3 cylinders for strength test broken at 3, 7, and 28 days until the Engineer is assured that the mix will be between 50 to 100 PSI at 28 days. Thereafter, one set of strength tests shall be taken every 50 CY.

It is intended that the sand be fine enough to stay in suspension in the mixture to the extent required for proper flow. The Engineer reserves the right to reject the sand if a flowable mixture cannot be produced.

- D. Mortar Mix Proportioning
1. The initial trial mixture shall be as follows:
- Quantity of Dry Materials per Cubic Yard

Cement	100 lbs.
Fly Ash	250 lbs.
Sand (SSD)*	2700 lbs.
Water	500 lbs.

* saturated-surface dry

These quantities of materials are expected to yield approximately 1 cubic yard of mortar of the proper consistency. Adjustments of the proportions may be made providing the total absolute volume of the materials is maintained.

2.6 EMBANKMENTS

- A. Soils suitable for use in an embankment must conform to ODOT 703.16 and are restricted as follows:

1. Maximum laboratory dry weight shall not be less than 90 pounds per cubic foot, except that soils having maximum dry weights of less than 100 pounds per cubic foot shall not be used in the top 12 inches of embankment.
2. Soil having a liquid limit in excess of 49 are considered as unsuitable for use in an embankment.
3. Silt from excavation or borrow identified as Ohio Classification A-4b shall be considered suitable for use in an embankment only when placed at least 3 feet below the surface of the subgrade.
4. No slag, recycled Portland cement concrete or recycled asphaltic concrete products are suitable for use in an embankment.
5. Do not use any suitable material that cannot be incorporated in an 8-inch lift in the top 2 feet of the embankment.
6. Do not use shale, hard shale, or siltstone in the top 2 feet of embankment.
7. Do not use materials that cannot be satisfactorily placed and compacted to a stable and durable condition.
8. Material excavated in the work that contains excessive moisture is unsuitable for embankment construction unless dried. Dry or aerate such material before incorporating in the work. The Contractor may elect to waste this material, instead of drying it.
9. Granular material Type E as specified in ODOT 703.16.C, is not allowed.
10. No petroleum contaminated soils are suitable for use in an embankment.

2.7 ENGINEERED FILL

- A. Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940. The aggregate shall meet the following gradation requirements:

<u>Sieve</u>	<u>Total Percent Passing</u>
2 inch	100
1 1/2 inch	95-100
3/4 inch	70-92
3/8 Inch	50-70
No. 4	35-55
No. 30	12-25
No. 200	0-8

2.8 ACCESSORIES

- A. Warning Tape
1. Acid-and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities,

6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored as follows:

- a. Red: Electric.
- b. Yellow: Gas, oil, steam, and dangerous materials.
- c. Orange: Telephone and other communications.
- d. Blue: Water systems.
- e. Green: Sewer systems.

B. Detectable Warning Tape

- 1. Acid-and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
 - a. Red: Electric.
 - b. Yellow: Gas, oil, steam, and dangerous materials.
 - c. Orange: Telephone and other communications.
 - d. Blue: Water systems.
 - e. Green: Sewer systems.

PART 3 EXECUTION

3.1 PROTECTION

A. Excavation; Temporary Sheet piling, Shoring, and Bracing

- 1. All excavation shall be in accordance with the Occupation Safety and Health Administration (OSHA) regulations.
- 2. The Contractor shall furnish and install adequate sheet piling, shoring, and bracing to maintain safe working conditions, and to protect newly

built work and all adjacent neighboring structures from damage by settlement.

3. Bracing shall be arranged so as not to place a strain on portions of completed work until construction has proceeded enough to provide ample strength. Sheeting and bracing may be withdrawn and removed at the time of backfilling, but the Contractor shall be responsible for all damage to newly built work and adjacent and neighboring structures.
4. All sheeting shall be removed unless specifically authorized in writing by the Engineer to be left in place.

B. Construction Sheeting Left in Place

1. The Contractor shall furnish, install, and leave in place construction sheeting and bracing when specified or when indicated or shown on the Drawings.
2. Any construction sheeting and bracing which the Contractor has placed to facilitate his work may be ordered in writing by the Engineer to be left in place. The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating an obligation on his part to issue such orders. Failure of the Engineer to order sheeting and bracing left in place shall not relieve the Contractor of his responsibility under this Contract.

3.2 REPLACING, MOVING AND REPAIRING OF EXISTING UTILITIES

A. The Contractor shall:

1. replace, move, repair and maintain all utilities and all other structures encountered in the work
2. coordinate and communicate with applicable utility companies
3. repair all damage done to any of the said structures and appurtenances through his acts or neglect and shall keep them in repair during the life of this contract. The Contractor shall in all cases leave them in as good condition as they were previous to the commencement of the work and to the satisfaction of the Engineer.

3.3 DEWATERING

A. Drainage and Removal of Water

1. The Contractor shall dispose of water from the Work in a suitable manner without damage to adjacent property or structures.
2. The Contractor shall, when ordered by the Engineer, construct tight bulkheads across trench and provide pumps suitable for the removal of any water which may be encountered or which may accumulate in the

trenches. Unless otherwise provided for in the Contract Documents, drainage water will not be permitted to flow through the conduit.

3. The trench shall be kept free from sewage and storm, surface, and subsurface water to at least 2 feet below the bottom of the excavation.
4. Where open water courses, ditches, or drain pipes are encountered during the progress of the Work, the Contractor shall provide protection and securing of the continuous flow in such courses or drains and shall repair any damage that may be done to them.

3.4 EXCAVATION CLASSIFICATION

- A. All excavated materials are unclassified as defined in Article 1.3.

[or]

- (A. *The following classifications of excavation shall apply to Work of this Section*
1. *Earth excavation includes excavation of pavements and other obstructions visible on the ground surface; underground structures, utilities and other items indicated to be demolished and removed; together with earth and other materials encountered that are not classified as rock.*
 2. *Rock excavation includes excavation of all materials defined as rock. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by the Engineer.)*

3.5 GENERAL EXCAVATION

- A. All necessary excavation for buildings, structures, pavements, and site improvements shall be performed to accommodate the completion of all related Contract Work.
- B. The Drawings show the horizontal and the lower limits of structures. The methods and equipment used by the Contractor when approaching the bottom limits of excavation shall be selected to provide a smooth surface and to prevent disturbing the soil below the bottom limits of excavation. All soil loosened during excavation shall be removed from the bottom of the excavation.
- C. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

- D. Excavation which is carried below the bottom limits of structures shall be classified as Unauthorized Excavation, unless said excavation below bottom limits of structures has been authorized by the Engineer prior to each occurrence.
- E. Unauthorized Excavation shall be filled with Class B concrete to the bottom limits of structures. Under circumstances where structural integrity is not a factor, the Engineer may authorize the filling of Unauthorized Excavation with Low Strength Mortar Backfill or Special Backfill material compacted to 100% density as specified under the compaction requirements in this Section. Such work shall be at the cost of the Contractor.

3.6 TRENCH EXCAVATION

- A. Excavation for trenches in which pipelines, sewers, and conduits are to be installed shall provide adequate space for workmen to space and joint pipe properly, but in every case the trench shall be kept to a minimum width. The width of trench shall not exceed the limits shown on the Drawings.
- B. Excavation shall be to the depth necessary for placing of granular bedding material under the pipe as shown on the Drawings. If over-excavation occurs, the trench bottom shall be filled to grade with compacted granular bedding material.
- C. Trenching operations shall not be performed beyond the distance that will be backfilled and compacted the same day.
- D. In general, backfilling shall begin as soon as the conduit is in approved condition to receive it and shall be carried to completion as rapidly as possible. New trenching shall not be started when earlier trenches need backfilling or the surfaces of streets or other areas need to be restored to a safe and proper condition.

3.7 EXCAVATION OF UNSUITABLE MATERIALS

- A. Unsuitable materials existing below the Contract bottom limits for excavation shall be removed as directed by the Engineer. Such excavation shall not exceed the vertical and lateral limits as prescribed by the Engineer.
- B. In utility trenches, the voids left by removal of unsuitable excavated material shall be filled with AASHTO M 43 No. 1 and No. 2 aggregate conforming to the material requirements of Article 2.1 of this Section.
- C. In excavations other than utility trenches, the voids left by removal of unsuitable excavated material shall be filled with material consisting of either:
(1) Special Backfill Material; (2) Class B concrete; or (3) Low Strength Mortar Backfill, whichever is ordered by the Engineer.

- D. Removal of unsuitable excavated material and its replacement as directed will be paid on basis of Contract Conditions relative to Changes in Work unless specific unit prices have been established for excavation of unsuitable material.

3.8 DISPOSAL OF UNSUITABLE AND SURPLUS MATERIAL

- A. It shall be the responsibility of the Contractor to dispose of all surplus material that cannot be used in backfill or embankments at his expense outside the limits of the project. Unsuitable excavated material, including rock or large boulders, shall be disposed of outside the limits of the project.
- B. Surplus material may be wasted adjacent to or incorporated in the regular construction only when ordered in writing by the Engineer.

3.9 BACKFILL

- A. Pipelines, Sewers and Conduits
 - 1. All pipe shall have bedding extending the width of the trench with depth in conformance with the Drawings. The bedding material shall be thoroughly compacted by tamping until no further densification is possible.
 - 2. Pipe cover material shall be used for filling above the pipe bedding along the sides of the pipe and to a height of twelve (12) inches over the top of the pipe. The pipe cover material shall be brought up evenly on both sides of the pipe to eliminate the possibility of lateral displacement of the pipe and shall be thoroughly compacted by tamping until no further densification is possible. Care shall be taken to spade the aggregate under the pipe haunch below the springline.
 - 3. All trenches and excavations shall be backfilled immediately after pipe is laid therein, unless otherwise directed by the Engineer.
 - 4. After the pipe cover has been placed and compacted around the pipe as specified above, the remainder of the trench may be backfilled by

machine. The backfill material shall be deposited in eight (8) inch horizontal layers, and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed. In no case will backfilling material from a bucket be allowed to fall directly on a pipe and in all cases the bucket must be lowered so that the shock of the falling earth will not cause damage.

5. Puddling of sand bedding and pipe cover material is acceptable provided an acceptable method for removal of water is provided.

B. Structures

1. Backfilling shall not commence before concrete has attained specified strength. Do not use equipment for backfilling and compaction operations against structures that will overload the structure.
2. Backfilling around and over structures shall be carefully placed and tamped with tools of suitable weight to a point one (1) foot above the top of same. Additional backfill may be required to protect the structure from damage from heavy equipment. Backfill shall be placed in uniform layers not exceeding eight (8) inches in depth. Each layer shall be placed, then carefully and uniformly compacted to the specified density so as to eliminate the possibility of displacement of the structure.
3. After the backfill has been placed and compacted around the structure to the height specified above, the remainder may be backfilled by machine. The backfill material shall be deposited in eight (8) inch horizontal layers, and each layer shall be thoroughly compacted to the specified density by approved methods before a succeeding layer is placed. In no case will backfilling material from a bucket be allowed to fall directly on a structure, and in all cases the bucket must be lowered so that the shock of the falling earth will not cause damage.

- C. Where any new, proposed, or future pavement, driveway, parking lot, curb, curb and gutter, or walk is to be placed over a backfilled area, Special Backfill material shall be used for any portion of the trench falling within the pavement prism.

- D. Where it is necessary to undercut or replace existing utility conduits and/or service lines, the excavation beneath such lines shall be backfilled the entire length with approved Granular Pipe Embedment Material compacted in place in eight (8) inch layers to the required density. The approved Granular Pipe Embedment Material shall extend outward from the spring line of the conduit a distance of two (2) feet on either side and thence downward at its natural slope.

3.10 LOW STRENGTH MORTAR BACKFILL

- A. Low strength mortar backfill shall be discharged from the mixer as recommended by the supplier and approved by the Engineer.
- B. Low strength mortar backfill may be placed in the trench in as few lifts as may be practical.
- C. Secure conduit or pipelines before placing low strength mortar backfill to prevent conduits and pipelines from floating during backfilling.
- D. For low strength mortar backfill placed against existing structures of unknown strength, backfill material shall be brought up uniformly in maximum 12 inch lifts and allowed to cure for a minimum of 24 hours or until it can carry a person's weight without leaving imprints before the next lift is placed.
- E. Low strength mortar backfill shall be brought up to subgrade elevation or the pavement prism, whichever may be applicable.

3.11 EMBANKMENT

- A. In making fill for embankment, the surface of the existing ground shall be cleared, grubbed, stripped of organic material, plowed, compacted according to the requirements specified in this Section, and stepped on slopes so as to enable bond or firm bearing for the new fill. The materials for these fills shall be selected of approved materials free from organic matter and placed in horizontal layers not exceeding eight (8) inches in thickness when loose, each layer being thoroughly compacted. Materials shall not be placed when fill or foundation is frozen.
- B. Where fill is to be placed on side slopes steeper than one (1) vertical to six (6) horizontal, steps shall be formed into the slope before any embankment is placed. These steps shall be cut at vertical intervals at no more than two (2) feet and shall have a horizontal dimension of not less than three (3) feet.
- C. As fill progress, the top shall be kept crowned or sloped for drainage. No pavement shall be placed upon embankment until it meets compaction testing requirements.
- D. Fills that abut or contain concrete or masonry structures shall be placed with care to avoid undue or unbalanced loads on these structures.

- E. Following the completion of embankment, all slopes shall be neatly and evenly dressed to proper elevation, grade and dimension.

3.12 SUBGRADE

- A. All soil subgrade shall be prepared in accordance with this subsection.
- B. Drainage
 - 1. The surface of the subgrade shall be maintained in a smooth condition to prevent ponding of water after rains to insure the thorough drainage of the subgrade surface at all times.
- C. Unsuitable Subgrade
 - 1. Where unsuitable subgrade or subgrade not meeting the required bearing capacity is encountered in cuts, due to no fault or neglect of the Contractor, in which satisfactory stability cannot be obtained by moisture control and compaction, the unstable material shall be excavated to the depth required by the Engineer.
 - 2. Suitable material required for the embankment to replace the undercut will be paid on basis of Contract Conditions relative to changes in Work.
 - 3. Where soft subgrade in cuts is due to the failure of the Contractor to maintain adequate surface drainage as required in this article, or is due to any other fault or neglect of the Contractor, the unstable condition shall be corrected as outlined above at no expense to the Owner.
- D. Full Width New Pavement Construction
 - 1. After the surface of the subgrade has been shaped to approximate cross section grade, and before any pavement, base or subbase material is placed thereon, the subgrade shall be compacted. When the rolling is completed, all surface irregularities shall be corrected and the surface of the subgrade shall be shaped as necessary to conform to the grade and cross section shown on the Drawings within the tolerance set forth in this Section and shall be so maintained until the overlying course is in place.

3.13 TOLERANCES

- A. The Contractor shall check the work under this item with templates, slope boards or other devices satisfactory to the Engineer. The completed work shall conform to the Drawings within the following tolerances:

1. For subgrade, the surface shall at no place vary more than $\frac{1}{2}$ inch from a ten-foot straight edge applied to the surface parallel to the centerline of the pavement, nor more than $\frac{1}{2}$ inch from subgrade elevation established by construction layout stakes.

3.14 CONSTRUCTION WITH MOISTURE AND DENSITY CONTROL

- A. All backfill and embankments, except rock embankments, shall be constructed using moisture and density control. All subgrade, except rock and shale in cut sections, shall be constructed using moisture and density control.
- B. Backfill, embankment and subgrade material which does not contain sufficient moisture to be compacted in accordance with the requirements of Article 3.17 of this Section shall be sprinkled with water as directed by the Engineer to bring the moisture content to within the range of optimum plus or minus three (3) percent. Water shall be thoroughly incorporated into the material by means of discs or other approved equipment.
- C. Backfill, embankment and subgrade material containing excess moisture shall be dried, prior to installation, to a moisture content not greater than three (3) percentage points above optimum, except that for material within the moisture content range specified herein that displays pronounced elasticity or deformation under the action of loaded construction equipment, the moisture content shall be reduced to optimum or below if necessary to secure stability. For subgrade material, these requirements for maximum moisture shall apply at the time of compaction of the subgrade and also at the time of placing pavement or subbase. Drying of wet soil shall be expedited by the use of plows, discs, or by other approved methods when so ordered by the Engineer.

3.15 PROOF ROLLING

- A. Proof rolling shall be performed on areas described on the Drawings or as directed by the Engineer.
- B. Proof rolling equipment shall consist of a single unit, tandem axle dump truck capable of being loaded to 30,000 pound axle load with a gross vehicle weight of 60,000 pounds. Tire pressure shall be maintained at 90 psi. Loading shall be verified by a certified weight slip.
- C. Procedure
 1. The designated areas of subgrade, prior to the placing of the overlying course, shall be compacted to requirement of this Section. The Contractor shall be responsible for performing a minimum of two (2)

proof rollings of the subgrade, as directed by the Engineer, prior to paving. The first proof rolling shall be performed after the installation of underground improvements and rough grading has been completed. After fine grading and just prior to paving, the subgrade shall be proof rolled again. The proof roller shall operate in a systematic manner so that the number of coverages over all areas can be readily determined and recorded. Maximum spacing shall not exceed six (6) feet.

2. Moisture content of the subgrade at the time of proof rolling shall conform to the requirements of this Section.
3. The equipment shall be operated at the speed directed, but in no case shall the speed exceed five (5) miles per hour, and the normal operating speed shall not be less than two (2) miles per hour.
4. Where the operation of the proof roller shows the subgrade to be unstable or to have non-uniform stability, the Contractor shall correct the unstable areas so that the stability of the subgrade will be uniform and satisfactory. The subgrade shall then be checked for conformance to the plan lines and any irregularities of the surface caused by operation of the proof roller shall be corrected and the subgrade shall be shaped to the plan lines within the tolerances specified in this Section.
5. The proof roll is a subjective test and does not relieve the Contractor of his responsibility under the Contract to provide an acceptable subgrade.
6. If the subgrade fails due to the Contractor using it as a haul road or due to his negligence, the subgrade shall be repaired, retested, and proof rolled again at no additional cost to the Owner.

3.16 FOUNDATION SURCHARGING

A. Subgrade Preparation, Compaction, Fill And Surcharging Procedure

1. Preparation of subgrade for support of compacted fill for future structure placement shall proceed as follows:
 - a. Strip vegetation, topsoil, organically contaminated soil, fill, debris remaining from former construction, and frozen soil from the surface of the subgrade. Refer to Specification Section 02200 for ground surface preparation. Benches shall be cut into sloped surfaces per specifications.
 - b. Proofroll the surface of the exposed subgrade with a fully loaded tandem-axle truck to disclose yielding areas in the subgrade surface. Remove soft yielding areas from the subgrade and replace them with compacted soil fill.

- c. Install [*specify number*] settlement plate(s) on the compacted subgrade (see Standard Details) (*centered*) on the building site. Place fill material, free of organic contamination, as required to establish finish grades, in horizontal layers of 8 inches maximum loose thickness, compacted in accordance with the project specifications. (*On-site silty sand and silty sand with gravel encountered at this site is suitable for use as fill.*) All material used as fill should be free from contamination by topsoil, organic matter, excess moisture, frozen soil, expansive materials (such as certain shale's, slag's and active clay minerals), and rocks greater than 6 inches in diameter. All stripping, proofrolling, undercutting, filling, and compacting shall be observed and tested by a qualified soil technician under the direction of the project Geotechnical Engineer.
- d. Apply a 3-foot surcharge fill (tracked compaction required). Surcharge fill to remain in place for minimum of 60 days before being removed.
- e. After surcharge fill has been removed, the subgrade at the structure's bottom elevation is to be reproofrolled and recompactd, if deemed necessary by the Project Engineer.

B. Monitoring Settlement

- 1. The Contractor shall be responsible for constructing and installing the settlement plate. He shall also take settlement readings as outlined below and promptly forward a copy to the Engineer after each reading. The Contractor shall utilize established benchmarks and provide readings on the same datum as the project was developed.
 - a. Take one (1) elevation reading during the fill placement and one (1) immediately after all placement is completed.
 - b. Take two (2) readings during the first week after fill is completed.
 - c. Take one (1) reading each week thereafter.

3.17 COMPACTION REQUIREMENTS

- A. The bottom of excavations upon which concrete foundations or structures are to be placed shall be compacted so as to obtain 100% of maximum dry density per ASTM D-698 in the top twelve (12) inches.
- B. The top twelve (12) inches of stripped original subgrade and final subgrade shall

be compacted to not less than 100% of maximum dry density per ASTM D-698.

1. Subgrade under new, proposed, or future pavement shall be compacted 18 inches beyond the edge of pavement, paved shoulders or paved medians.
- C. Compaction of subgrade for sidewalks (regardless of paving material) shall be 100% of maximum dry density per ASTM D-698 in the top six (6) inches.
- D. Compaction of non-paved areas shall be 90% of maximum dry density per ASTM D-698.
- E. Aggregate pipe embedment and aggregate backfill around structures shall be compacted to not less than 100% of maximum dry density per ASTM D-4253 and ASTM D-4254.
- F. Final backfill shall be compacted to not less than 100% of maximum dry density per ASTM D-698.
- G. Fill placed within the interior of structures shall be compacted to not less than 100% of maximum dry density per ASTM D-698.
- H. Embankment shall be placed and compacted in layers until the density is not less than the percentage of maximum dry density indicated in the following table determined by ASTM D-698.

EMBANKMENT SOIL COMPACTION REQUIREMENTS

Minimum Compaction

Maximum Laboratory

Dry Weight

Pounds/Cubic Foot

90-104.9

105-119.9

120 and more

Requirements

Percent Laboratory

Maximum

102

100

98

- I. Test Sections
 1. If it is determined by the Engineer that the composition of the material is such that it cannot be tested for density using a nuclear densometer or other methods; or where, in the opinion of the Engineer, in-place compaction testing is not feasible; and if approved by the Engineer, the Contractor may construct a test section to demonstrate acceptable compactive effort in lieu of in-place compaction testing. Test sections shall be constructed at no additional cost to the Owner.
 2. The test section shall be completed by repeatedly compacting the material

until no further density is achieved. This value shall be the Minimum Test Section Density (MTSD). The compaction equipment used to complete the test section shall be of suitable size to compact the material and shall be the same equipment used to compact the in- place material.

3. The test section shall be constructed with moisture density control as specified in this Section.
4. The material shall be compacted to at least 98% of the MTSD.
5. Each lift of in-place fill or backfill shall be densified using a compactive effort equal to or greater than the effort applied to achieve the MTSD; i.e., if six passes were required to achieve MTSD, then each lift of material shall be compacted using six or more passes.
6. Construct a new test section when, in the opinion of the Engineer, the fill or backfill material has changed character or when the supporting material has changed character.

3.18 GRADING

A. Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading

1. Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
 - a. Lawn or unpaved areas shall be graded to plus or minus (*1 inch*) (*insert tolerance*).
 - b. Walks shall be graded to plus or minus (*1 inch*) (*insert tolerance*).

C. Grading inside Building Lines

1. Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot

straightedge.

END OF SECTION

SECTION 31 23 19 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes construction dewatering.
- B. Related Sections include the following:
 - 1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
 - 2. Division 2 Section "Excavation Support and Protection."
 - 3. Division 2 Section "Earthwork" for excavating, backfilling, site grading and for site utilities.
 - 4. Division 2 Section "Subdrainage" for permanent foundation wall, underfloor, and footing drainage.

1.3 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: **Design**, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control ground-water flow into excavations and permit construction to proceed on dry, stable subgrades.
 - 1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Accomplish dewatering without damaging existing buildings adjacent to excavation.
 - 4. Remove dewatering system if no longer needed.

1.4 SUBMITTALS

- A. Shop Drawings for Information: For dewatering system. Show arrangement, locations, and details of wells and well points; locations of headers and discharge lines; and means of discharge and disposal of water.
 - 1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.

2. Include a written report outlining control procedures to be adopted if dewatering problems arise.
 3. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Qualification Data: For [**Installer**] [**and**] [**professional engineer**].
 - C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.
 - D. Record drawings at Project closeout identifying and locating capped utilities and other subsurface structural, electrical, or mechanical conditions performed during dewatering.
 1. Note locations and capping depth of wells and well points.
 - E. Field Test Reports: Before starting excavation, submit test results and computations demonstrating that dewatering system is capable of meeting performance requirements.

1.5 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.
- B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.
 1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
 2. The geotechnical report is [**referenced**] elsewhere in the Project Manual.
- C. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks , maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.
 1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
 2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
- B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed, or until dewatering is no longer required.
- C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
- D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of **[24 inches (600 mm)] [60 inches (1500 mm)]** below surface of excavation.
- E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.
- F. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to Owner.
 1. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.
- G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 OBSERVATION WELLS

- A. Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated and additional observation wells as may be required by authorities having jurisdiction.
- B. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
- C. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. Suspend construction activities in areas where observation wells are not functioning properly until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.
 1. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

END OF SECTION

SECTION 31 23 23.13 - BACKFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish, place and compact all the materials needed from select excavated materials or furnish additional suitable material if the excavated material is deemed unsuitable or the moisture content is not or cannot be made to be within acceptable tolerances of optimum moisture to achieve the specified compaction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Suitable excavated material as specified in ODOT Item 203.

PART 3 - EXECUTION

3.1 PLACING

- A. Compacted backfill shall be properly placed in layers sufficient to meet the compaction requirement of 95% of maximum laboratory dry density per ASTM D 698 throughout the entire layer and thoroughly compacted with mechanical compaction equipment with moisture adjustment as needed. Should after settlement occur, the Contractor must add and compact additional material, and he must maintain the backfill at the required finished grade or sub-grade until the project is satisfactorily completed and during the correction period.
- B. Approved mechanical compaction equipment shall be used for tamping backfill. Flooding, jetting or puddling of backfill will not be permitted.

END OF SECTION

SECTION 31 23 23.14 - GRANULAR BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. The Contractor shall furnish, place and compact all the materials needed.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Aggregate shall be ODOT 304 crushed limestone. Crushed gravel or slag products are unacceptable.
- B. Contractor shall submit current test reports for the lot(s) of the material to be supplied.

PART 3 - EXECUTION

3.1 PLACING AND COMPACTING

- A. Compacted granular backfill shall be properly placed in layers sufficient to meet the compaction requirement of 100% of maximum laboratory dry density per ASTM D 698 throughout the entire layer and thoroughly compacted with mechanical compaction equipment with moisture adjustment as needed. Should after settlement occur, the Contractor must add and compact additional material, and he must maintain the backfill at the required finished grade or sub-grade until the project is satisfactorily completed and during the correction period.
- B. Approved mechanical compaction equipment shall be used for tamping backfill. Flooding, jetting or puddling of backfill will not be permitted.

END OF SECTION

SECTION 31 50 00 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes temporary excavation support and protection systems.
- B. Related Sections include the following:
 - 1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities and support facilities.
 - 2. Division 2 Section "Dewatering" for dewatering excavations.
 - 3. Division 2 Section "Earthwork" for excavating and backfilling and for existing utilities.
 - 4. Division 3 Section "Shotcrete" for use in excavation support and protection.

1.3 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer.
 - 2. Prevent surface water from entering excavations by grading, dikes, or other means.
 - 3. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.

1.4 SUBMITTALS

- A. Shop Drawings for Information: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems.
 - 1. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Qualification Data: For Installer and professional engineer.

- C. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems.

1.5 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
- B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.
 - 1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
 - 2. The geotechnical report is [**referenced**] elsewhere in the Project Manual.
- C. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of [**3 inches (75 mm)**] [**4 inches (100 mm)**].
- E. Shotcrete: Comply with Division 3 Section "Shotcrete" for shotcrete materials and mixes, reinforcing, and shotcrete application.

- F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- G. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
 - 1. Shore, support, and protect utilities encountered.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces is not impeded.
- D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER BEAMS AND LAGGING

- A. Install steel soldier beams before starting excavation. Space soldier beams at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment.
- B. Install wood lagging within flanges of soldier beams as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at centers indicated and secure to soldier beams.

3.3 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Limit vertical offset of adjacent sheet piling to 60 inches (1500 mm). Accurately align exposed faces of sheet piling to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

- A. Tiebacks: Drill for, install, grout, and tension tiebacks into position. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
 - 1. Test loading shall be observed by a qualified professional engineer responsible for design of excavation support and protection system.
 - 2. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.5 BRACING

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
 - 1. Do not place bracing where it will be cast into or included in permanent concrete work, unless otherwise approved by Architect.
 - 2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
 - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlying construction and abandon remainder.
 - 2. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Leave excavation support and protection systems permanently in place.

END OF SECTION

SECTION 33 01 00 - OPERATION AND MAINTENANCE OF UTILITIES

PART 1 - GENERAL

1.1 PIPE TO BE TESTED

- A. All thermoplastic gravity sanitary sewer pipe shall be tested for allowable deflection.

1.2 TIMEFRAME FOR TESTING

- A. Deflection tests shall be performed before final acceptance and no sooner than thirty (30) days after installation of final backfill

1.3 ALLOWABLE DEFLECTION

- A. Maximum allowable pipe deflection shall be five (5) percent of the average inside diameter for the size and class of pipe specified.

1.4 DESCRIPTION OF WORK

A. EQUIPMENT

1. Acceptance testing shall be performed with a non-adjustable "go, no-go" mandrel with a minimum of eight (8) contact points. Adjustable mandrels for acceptance testing shall be used only with permission of the Engineer.
2. The mandrel size shall be ninety-five (95) percent of the average inside diameter for the size and class of pipe specified.
3. If the "go, no-go" mandrel will not pass through a section of pipe a deflectometer or adjustable mandrel may be used to determine the extent and/or severity of the non- acceptable area. A "go, no-go" mandrel shall be re-run through the pipe section for final acceptance testing at no additional cost to the Owner.

B. TESTING

1. The contractor or subcontractor performing the test shall be experienced and qualified to perform deflection testing with the equipment and procedures utilized. The contractor shall provide all labor, materials, tools and equipment necessary to clean and test all sections of sewer pipe, locate deficient areas, repair, deficient areas, and retest all repaired areas.
2. All sewer runs shall be cleaned prior to testing.
3. The acceptance test shall be performed without mechanical pulling devices.

1.5 REPAIR OF DEFECTIVE PIPE

- A. All pipe failing the deflection test shall be exposed and repaired or replaced as approved by the Engineer at no additional cost to the Owner.

END OF SECTION

SECTION 33 42 11 - STORM DRAINAGE SYSTEM

Part 1

- 1.1 Summary**
- 1.2 Related Documents and Sections**
- 1.3 Products Installed But Not Furnished Under This Section**
- 1.4 Definitions**
- 1.5 Submittals**
- 1.6 References**
- 1.7 Quality Assurance**
- 1.8 Project Conditions**
- 1.9 Delivery, Storage and Handling**
- 1.10 Sequencing and Scheduling**

Part 2

- 2.1 Pipe**
- 2.2 Precast Reinforced Concrete Manhole Riser Sections, Inlets, and Catch Basins**
- 2.3 Masonry Manhole Risers, Inlets, and Catch Basins**
- 2.4 Manhole Steps**
- 2.5 Castings**
- 2.6 Couplings**

Part 3

- 3.1 Alignment and Grade**
- 3.2 Pipe Installation**
- 3.3 Jointing**
- 3.4 Permissible Deflection at Joints**
- 3.5 Manholes**
- 3.6 Inlets and Catch Basins**
- 3.7 Branch Connections**
- 3.8 Maintaining Flow**
- 3.9 Replacing, Moving, and Repairing of Existing Utilities**
- 3.10 Connection to Existing Sewer System**
- 3.11 Clean-up**
- 3.12 Defects to be Made Good]**

PART 1 GENERAL

1.1 SUMMARY

- A. Furnishing all labor, materials, tools, equipment, and services for all storm sewers as shown on the Drawings.
- B. Although such is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a functional and complete installation.

1.4 DEFINITIONS

1.5 SUBMITTALS

- A. Product Data
 - 1. PVC pipe, each type specified
 - 2. Polyethylene pipe
 - 3. Reinforced concrete pipe, each type specified
 - 4. Vitrified clay pipe
 - 5. Ductile iron pipe
 - 6. Manhole castings
 - 7. Precast concrete manholes and inlets
 - 8. Concrete masonry block
 - 9. Brick
 - 10. Manhole steps
- B. Shop Drawings
 - 1. Precast concrete manholes showing:
 - a. Orientation plan for each manhole or inlet indicating where all pipes connect.
 - b. The size and elevation of connecting pipes.
 - c. Details of drop connections.
 - d. Invert concrete channeling details.
 - e. Pipe to manhole connection details.
 - f. Casting and step orientation.
 - 2. Precast concrete inlets
- C. Samples

- D. Quality Control Submittals
 - 1. Design Data
 - 2. Test Reports
 - 3. Certificates
 - a. Evidence of current membership in specified manufacturer's associations.
 - b. Evidence of ODOT precertification for the manufacturing RCP pipe.
 - c. Evidence of National Precast Concrete Association (NPCA) certification for the manufacture of precast concrete manholes, inlets and catch basins.
 - 4. Manufacturer's Instructions
- E. Contract Closeout Submittals
 - 1. Project Record Documents
 - 2. Operation and Maintenance

1.6 REFERENCES

- A. ASTM A-48 Standard Specification for Gray Iron Castings
- B. ASTM A-536 Standard Specification for Ductile Iron Castings
- C. ASTM C-12 Standard Practice for Installing Vitrified Clay Pipe Lines
- D. ASTM C-32 Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale)
- E. ASTM C-55 Standard Specification for Concrete Building Brick
- F. ASTM C-76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- G. ASTM C-139 Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes
- H. ASTM C-150 Standard Specification for Portland Cement
- I. ASTM C-270 Standard Specification for Mortar for Unit Masonry
- J. ASTM C-425 Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings
- K. ASTM C-443 Standard Specifications for Joints for Concrete Pipe and

Manholes, Using Rubber Gaskets

- L. ASTM C-478 Standard Specifications for Precast Reinforced Concrete Manhole Sections
- M. ASTM C-507 Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe
- N. ASTM C-700 Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated
- O. ASTM C-990 Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
- P. ASTM C-1173 Standard Specification for Flexible Transition Couplings for Underground Piping Systems
- Q. ASTM D-2321 Standard Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe
- R. ASTM D-3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
- S. ASTM D-3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- T. ASTM F-477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- U. ASTM F-679 Standard Specification for Poly(Vinyl Chloride) (PVC) Large Diameter Plastic Gravity Sewer Pipe and Fittings
- V. ASTM F-1336 Standard Specification for Poly(Vinyl Chloride) (PVC) Gasketed Sewer Fittings
- W. ANSI/AWWA C111/A21.11 American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
- X. ANSI/AWWA C151/A21.51 American National Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids
- Y. AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in., for Water Distribution
- Z. State of Ohio - Department of Transportation - Construction and Material

Specifications as amended to date, Item 703.03, Fine Aggregate for Mortar or Grout.

AA. State of Ohio - Department of Transportation - Construction and Material Specifications as amended to date, Item 706.04, Reinforced Concrete Elliptical Culvert, Storm Sewer, and Sewer Pipe.

AB. State of Ohio - Department of Transportation - Construction and Material Specifications as amended to date, Item 706.10, Bituminous Pipe Joint Filler

AC. State of Ohio - Department of Transportation - Construction and Material Specifications as amended to date, Item 706.13, Precast Reinforced Concrete Manhole Riser Sections, Catch Basin and Inlet Tops, and Temporary Barrier

AD. State of Ohio - Department of Transportation - Construction and Material Specifications as amended to date, Item 707.33, Corrugated Polyethylene Smooth Lined Pipe

1.7 QUALITY ASSURANCE

- A. Qualifications
- B. Regulatory Requirements
- C. Certifications
- D. Field Samples
- E. Pre-Installation Conference

1.8 PROJECT CONDITIONS

- A. Environmental Requirements
- B. Existing Conditions
 - 1. Verify locations of underground utilities.
 - 2. Protect existing structures and utilities from damage. Repair if damaged by this work.
 - 3. Do not change pipe sizes without securing written approval of Engineer.
- C. Field Measurements
 - 1. If it becomes necessary to change location of storm drainage lines due to underground utility interference, secure approval of Engineer.
 - 2. If Contractor initiated, make changes approved by the Engineer without added cost to Owner.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping
- B. Acceptance at Site
 - 1. All material and all equipment shall be subject to visual inspection and acceptance or rejection after delivery to the site of the work. All rejected material shall immediately be removed from the site.
- C. Storage and Protection

1.10 SEQUENCING AND SCHEDULING

- A. Perform no pipe work in fill areas until embankment or fill has been completed to at least two (2) feet above proposed top of pipe and fill has been properly compacted.

PART 2 PRODUCTS

2.1 PIPE

- A. Polyvinyl Chloride Pipe (PVC) 4" - 15" Diameter
 - 1. All polyvinyl chloride pipe in this size range shall conform to ASTM D-3034 (SDR 35) (SDR 26), shall be integral bell and spigot type, with joints conforming to ASTM D-3212 and elastomeric seals conforming to ASTM F-477.
 - 2. All pipe and fittings shall be marked or stenciled in conformance with ASTM D-3034. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
 - 3. Acceptable manufacturers shall be current members of the Uni-Bell Plastic Pipe Association.
- B. Polyvinyl Chloride Pipe (PVC) 18" - 36" Diameter
 - 1. All large diameter polyvinyl chloride pipe shall conform to ASTM F-679 (PS46) (PS115), shall be integral bell and spigot type, with joints conforming to ASTM D-3212 and elastomeric seals conforming to ASTM F-477.
 - 2. All pipe and fittings shall be marked or stenciled in conformance with ASTM F-679. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
 - 3. Acceptable manufacturers shall be current members of the Uni-

Bell Plastic Pipe Association.

C. Corrugated Polyethylene Pipe 12" Diameter and Larger

1. All corrugated polyethylene pipe in this size range shall be smooth lined conforming to ODOT 707.33. All pipe and fittings shall be marked or stenciled with the appropriate classification.

[The Class Thickness must be calculated and specified in the following two paragraphs.]

Reinforced Concrete Pipe

2. All reinforced concrete circular pipe shall be Class Pipe conforming to ASTM C-76. Joints shall conform to the requirements of ASTM C-443 as it pertains to the use of confined O-Ring rubber gaskets placed in grooves cast in the spigot of the pipe such that the gaskets will be enclosed on all sides when the pipe is laid and the joint is completed. Cement used in manufacturing pipe and fittings shall be Type I conforming to ASTM C-150.
3. All reinforced concrete elliptical pipe shall conform to ASTM C-507, Class as modified by ODOT 706.04. Bitumen sealants conforming to ASTM C-990 shall be used for joints in reinforced concrete elliptical pipe not subject to infiltration or exfiltration limits.
4. All pipe and fittings shall be marked or stenciled with the applicable ASTM specification designation on the interior surface of the pipe. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
5. Acceptable manufacturers shall be precertified by the Ohio Department of Transportation for the type of pipe specified.

D. Clay Pipe

1. All clay sewer pipe shall be extra strength pipe conforming to ASTM C-700. Clay pipe shall be furnished with flexible compression joints conforming to ASTM C-425. A factory applied polyester resin casting shall be provided in the bell and on the spigot. An O-ring gasket shall be provided to fit in the groove on the spigot end to form a tight and flexible compression joint when assembled.
2. All pipe and fittings shall be marked or stenciled in conformance with ASTM C-700 on the interior surface of the pipe. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.

E. Ductile Cast Iron Pipe

1. Ductile cast iron pipe shall be designed in accordance with ANSI/AWWA C150/A21.50 and manufactured in accordance with ANSI/AWWA C151/A21.51, and shall be Thickness Class . Pipe shall be coated with a bituminous material on the outside and shall be cement mortar lined in accordance with ANSI/AWWA C104/A21.4. Joints shall be mechanical

or push-on in conformance with ANSI/AWWA C111/A21.11 incorporating rubber gaskets. Mechanical joints shall be used wherever joint restraint is required. Bolts for mechanical joints shall be made of either high strength cast iron containing a minimum of 0.50 percent copper or high strength low alloy steel conforming to ANSI/AWWA C111/A21.11.

2. All pipe shall be marked or stenciled in conformance with ANSI/AWWA C151/A21.51. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
3. Acceptable manufacturers are:
 - a. U.S. Pipe
 - b. Tyler Pipe

2.2 PRECAST REINFORCED CONCRETE MANHOLE RISER SECTIONS, INLETS AND CATCH BASINS

- A. All precast concrete units shall conform to ASTM C-478 and ODOT Item 706.13.
- B. Joints between manhole units shall be gasketed and shall comply with the requirements of ASTM C-443. All gaskets shall be marked or stenciled with the ASTM specification designation, name or trademark of the manufacturer, and pipe size.
- C. Joints between inlet or catch basin sections shall be sealed with material conforming to ODOT Item 706.10.
- D. The standard length of manhole riser units shall be 48 inches. Lengths of 32 inches or 16 inches shall be used to meet required dimensions.
- E. Openings for connecting pipes in riser units, bottom riser units, integral base units, and for access in flat slabs shall be preformed or cored by the manufacturer. Cut-out openings shall be made immediately after the pipe is removed from the casting form.
- F. Connectors between new precast concrete manholes and pipes shall be made by casting the connector integrally with the manhole wall. The connectors shall be "X-Cel" Type as manufactured by A-Lok Products; or an approved equivalent.
- G. All openings in existing manholes, inlets or catch basins shall be field cored.
- H. Annular spaces at pipe entrances shall be field sealed with a one component, hydraulic cement based, fast setting repair mortar equal to Thoro Products Waterplug as manufactured by ChemRex Inc., Shakopee, MN.

I. The top four (4) inches to twelve (12) inches of the manhole shall provide for adjustment of casting to grade. Adjustment shall be through the use of a maximum of two (2) precast concrete adjusting collars.

J. Precast concrete shall be manufactured by an NPCA certified plant.

2.3 MASONRY MANHOLE RISERS, INLETS AND CATCH BASINS

A. General

1. All inlets and catch basins shall be constructed of precast concrete unless the project involves reconstruction of existing inlets/catch basins.

B. Concrete Masonry Block

1. Block used in catch basins, inlets, storm manholes, and storm junction chambers shall be concrete masonry block conforming to ASTM C-

139. The exterior of the masonry structures shall be parged with one-half (½) inch mortar.

C. Brick

1. Brick used in catch basins, inlets, storm manholes, and for grade adjustment shall conform to ASTM C-32, Grade MS.

D. Masonry Mortar

1. Mortar shall conform to ASTM C-270, Type M, but shall not contain masonry cement.
2. Mortar shall be UltraMortar Type M as manufactured by UltraKote Products, Inc. or Lafarge Mortar Cement, Type M as manufactured by Lafarge Corporation, or approved equal.
3. Only sufficient mortar shall be prepared for immediate use, and any mortar that has set shall not be retempered or used in the work.
4. Setting accelerators or anti-freeze compounds shall not be used.

E. Sand

1. Natural double washed sand conforming to the sieve size, soundness, and aggregation requirements of ODOT Item 703.03.

F. Water

1. All water used for mortar shall be free from organic matter, acids and strong alkalis and shall be of potable quality.

2.4 PVC INLETS AND CATCH BASINS

- A. All PVC inlets shall be manufactured from PVC pipe stock conforming to ASTM D-3034 and ASTM F-1336, using a thermo-molding process to reform the pipe stock to the configuration shown on the Drawings. The connection stubs shall conform to ASTM 3212.

2.5 MANHOLE STEPS

- A. All steps shall be minimum of twelve (12) inches in width with safety side lugs to prevent slipping and shall conform to the latest OSHA requirements. Manhole steps shall be of polypropylene plastic reinforced with a 3/8", No. 60 grade epoxy coated reinforcing rod.
- B. Manhole steps shall conform to the requirements of ASTM C-478.
- C. Acceptable manufacturers are:
 - 1. American Step Company, Inc.
 - 2. Lane International, Inc.
 - 3. M. A. Industries, Inc.

2.6 CASTINGS

- A. All castings shall be true to pattern and free from cracks, gas holes, flaws and excessive shrinkage. Surfaces shall be free from burnt-on sand and shall be reasonably smooth. Runners, fins, risers and other cast-on pieces shall be removed. Castings for frames, grates, covers and for any other purpose under these specifications shall conform to all the requirements for Class No. 35B for Gray Iron Castings conforming to ASTM A-48. All castings shall be commercially machineable and, in the case of manholes, the frame and cover shall be so machined that it will be impossible to rock the cover after it has been seated in the proper position in the frame.
 - 1. Frames, grates and covers shall be as detailed on the Drawings.
 - 2. Frame, grate, and cover shall be painted with one coat of the manufacturer's standard asphaltum paint.
- B. Acceptable manufacturers are:
 - 1. East Jordan Iron Works
 - 2. Neenah
- C. Castings for PVC inlets shall meet the requirements of Paragraph A above, except that castings may be ductile iron conforming to ASTM A-536 grade 70-

50-05 and shall be supplied by the inlet manufacturer.

2.7 COUPLINGS

- A. Couplings for connecting dissimilar pipe materials or pipe sizes shall be a rubber type coupling with a sealing "O" ring under each of two sealing clamp bands and a Type 316 stainless steel shear ring. Coupling shall be manufactured with natural and synthetic rubbers conforming to ASTM C 425 and ASTM C 1173.
- B. Coupling shall be Flex-Seal Adjustable Repair Coupling as manufactured by the Mission Rubber Company, Corona, CA, or approved equal.

PART 3 INSTALLATION

3.1 ALIGNMENT AND GRADE

- A. Horizontal and Vertical Control
 - 1. All horizontal and vertical control required for the complete layout and performance of the Work under this contract shall be done by a registered surveyor at the Contractor's expense, and any observations by the Engineer of the Contractor's methods will not relieve the Contractor of his responsibility.
 - 2. The Contractor shall be solely responsible for the accuracy of all horizontal and vertical control.
- B. Alignment and grade shall be established by means of a laser beam.
- C. The Contractor shall furnish all material and labor to establish line and grade of the generated laser beam from the benchmarks and control points indicated on the Drawings. The laser shall be securely anchored and checked periodically by the Contractor. The laser calibration shall be demonstrated when requested by the Engineer. Strict adherence to the manufacturer's operation procedure shall be observed. Only qualified and trained employees may be assigned to install, adjust, or operate laser equipment, and proof of qualifications of the equipment operator must be available at all times. Areas in which lasers are used must be posted with standard laser warning placards, and the laser beam shall be turned off when not needed. During rain, snow, dust, excessive heat, or fog the operation of laser systems shall be prohibited where practicable because of beam scatter.

3.2 PIPE INSTALLATION

- A. All pipe installation shall conform to the trench and bedding details shown on the Drawings.
- B. PVC pipe shall be installed in full compliance with ASTM D-2321. Clay pipe shall

be installed in full compliance with ASTM C-12. All concrete pipe shall be installed in conformity with recommended practices published by the American Concrete Pipe Association in the "Concrete Pipe Installation Manual".

- C. Only one type and strength of pipe shall be used between any two consecutive manholes, unless otherwise shown on the Drawings.
- D. After the trench has been excavated and the pipe bedded, the pipe shall be laid to the line and grade as shown on the Drawings. All joints shall be made as hereinafter specified. In no case shall any material except bedding material be placed under the bell of the pipe to secure proper grade.
- E. Prior to being lowered into the trench, each pipe shall be carefully inspected and those which are damaged or not meeting the specified requirements shall be rejected and clearly marked as rejected and removed from the Work. Satisfactory means shall be used to hold the pipe in line until embedment of pipe is complete. Precautions shall be taken to insure that the spigot end of the pipe being laid is pushed the proper depth into the bell of the preceding pipe.
- F. All conduit shall be laid starting at the outlet end and laid with the bell end upstream.
- G. In no case shall more than thirty (30) feet of trench be opened in advance of the pipe laying operations.
- H. Conduit shall not be laid in water, mud, or any otherwise unsuitable trench. No drainage shall run through the newly laid pipe. All sewers shall be temporarily capped with a watertight seal at the open ends at the completion of each day's work and no drainage water shall be permitted to flow through the sewer.
- I. All trenches and excavations shall be backfilled as specified as soon as possible after the pipe is laid and jointed. Where concrete encasement or cradle is used, pipe shall not be backfilled for at least twentyfour (24) hours after placing concrete except that pipe may be covered to a depth of not to exceed sixteen (16) inches over the top of the pipe.

3.3 JOINTING

- A. Polyvinyl Chloride (PVC) Pipe
 - 1. Dust, dirt and foreign matter shall be removed from joint surfaces. When jointing pipe using the required compression type joint, a lubricant recommended by the gasket manufacturer shall be used. The gasket shall be lubricated by drawing it through lubricant held in the hand of the worker, thus coating the entire surface of the gasket.
 - 2. When laying the pipe in concrete bedding, care shall be exercised to prevent the joint materials from coming in contact with the fresh concrete

until after the joint has been completed.

B. Concrete Pipe

1. Dust, dirt and foreign matter shall be removed from joint surfaces. A lubricant as furnished or recommended by the gasket manufacturer shall be applied to the gasket and joint surfaces with a brush, cloth pad, sponge or glove. For all gaskets not cemented to the pipe, a smooth round object shall be inserted under the gasket and run around the circumference two or three times to equalize stretch in the gasket. No jute or other caulking will be permitted. The spigot shall then be entered into the socket and the pipe shoved home in an approved manner to fully complete the particular type of joint which is being used.
2. When laying the pipe in concrete bedding, care shall be exercised to prevent the joint materials from coming in contact with the fresh concrete until after the joint has been completed.

C. Clay Pipe

1. When jointing pipe using a compression type joint, a lubricant as furnished or recommended by the pipe manufacturer shall be applied in the manner prescribed by the pipe manufacturer. No jute or other caulking will be permitted. The spigot shall then be entered into the bell and the pipe shoved home in accordance with the manufacturer's recommendations to fully complete the particular type of joint that is being used. The socket and spigot shall be free of any foreign matter that may prevent proper jointing of the pipe.
2. When laying the pipe in concrete bedding, care shall be exercised to prevent the joint materials from coming in contact with the fresh concrete until after the joint has been completed.

D. Ductile cast iron push-on joints

1. The gasket seat and the gasket shall be thoroughly cleaned and should be wiped with a clean cloth and a thin film of lubricant applied to the inside surface of the gasket that will come in contact with the entering pipe. Use only the lubricant furnished with the pipe. In no case shall a mineral oil or petroleum base lubricant be used.
2. The plain end of the pipe to be jointed shall be thoroughly cleaned and started into the socket so that it is in contact with the gasket. In some cases it may be desirable to apply a thin film of lubricant to the outside of the plain end for about one (1) inch back from the end. The joint is then completed by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket. Any manufacturer approved method may be used to home the pipe.
3. When laying the pipe in concrete bedding, care shall be exercised to

prevent the joint materials from coming in contact with the fresh concrete until after the joint has been completed.

E. Corrugated Polyethylene Pipe

1. Corrugated polyethylene pipe shall be jointed using split couplers. The ends of pipe to be joined must be cut along the centerline of the valleys of the annular corrugations. The gasket shall be placed in the first full corrugation valley. The coupler shall be placed in position on the pipe in the trench. The next pipe shall be brought up against the first and aligned with the corrugations on the coupler. A check on the pipe and coupler should be made to ensure that no foreign material is present to interfere with the connection. The coupler shall then be snugged around the pipes and secured with bands. The coupler shall be wide enough to cover two (2) pipe corrugations on each side of the joint.

3.4 PERMISSIBLE DEFLECTION AT JOINTS

- A. No pipe deflections or springing of joints, to effect a change in direction will be allowed, except by permission or direction of the Engineer, or as shown on the Drawings. Any permitted or directed deflection shall be a maximum of 80 percent of the allowable deflection value established by the pipe manufacturer.

3.5 MANHOLES

- A. Build each manhole to dimensions shown on Drawings and at such elevation that pipe sections built into wall of manhole will be true extensions of line of pipe.
- B. Set frames for manholes, within areas to be paved, to final grade. In asphalt pavement, surround frames set to grade with a ring of compacted asphalt concrete base material immediately after backfilling operations are complete. Place asphalt concrete mixture up to one (1) inch below top of frame, slope to grade, and compact with hand tamp.
- C. Storm manholes shall be constructed of precast concrete manhole sections, concrete masonry block, or concrete brick.
- D. Precast Concrete Manholes
 1. Precast bases shall be placed on a bed of crushed gravel or crushed limestone, meeting AASHTO M 43 gradation, having a minimum thickness of three (3) inches. The bedding shall be compacted and provide uniform support for the entire area of the base.
 2. Provision shall be made for a minimum of four (4) inches and a maximum of twelve (12) inches of precast concrete grade rings between the uppermost precast section and the bottom of the cast iron manhole frame in order to set manhole cover to grade.

3. No more than two lifting holes or other lifting devices shall be utilized for handling the precast sections. All lifting holes shall be acceptably sealed with a hydraulic cement based, fast setting repair mortar, meeting the requirements of Article 2.2 of this Section, prior to backfilling around the manhole.
4. Inverts shall be formed to the equivalent of half-pipes in concrete and as follows:
 - a. Carry concrete out to the manhole wall with a slope of $\frac{1}{2}$ in./ft. from the top of the half-pipe.
 - b. The bottoms of all manholes shall be channeled to conduct flow in the planned direction. Channels shall be the true shape of the lower half of the sewer pipe and shall match inverts of connecting pipe at the manhole wall.

E. Brick Masonry Manholes

1. All brick used in manhole construction shall be laid in full mortar beds with no mortar joint appearing on the inner surface of the manhole exceeding $\frac{3}{8}$ IN. thick.
2. Brick shall be laid in mortar with bricks arranged radially as headers, forming a wall eight (8) inches thick. Every sixth course shall be a header course. In deep manholes, the wall shall be twelve and one half ($12\frac{1}{2}$) inches thick below a point twelve (12) feet from the surface to a maximum depth of twenty five (25) feet.
3. Two ring brick arches shall be incorporated in the manhole masonry walls around all sewer pipes passing through the walls. The entire outer surface of the manhole shall be plastered with a smooth coating of mortar at least one half ($\frac{1}{2}$) inch in thickness. The top of the walls of manholes shall be properly leveled off with mortar so as to form a flat surface upon which the cast iron manhole frame is to rest and the manhole shall be carried to proper height above sewer. The Contractor shall furnish and set the manhole frame in mortar on top of each manhole.
4. Manhole steps shall be built into each manhole in accordance with the standard details and shall be continued downward along the interior side of the manhole vertically aligned and spaced not less than twelve (12) inches apart nor more than sixteen (16) inches apart. Manhole steps shall be aligned horizontally to terminate at the manhole base at 90 degrees to the main sewer flow stream.

3.6 INLETS AND CATCH BASINS

- A. Catch basins and inlets shall be built in accordance with the Drawings. Precast units shall be placed on a sand bed having a minimum thickness of three (3) inches. The bedding shall be compacted and provide uniform support for the entire area of the base.

- B. Set frames for catch basins and inlets, within areas to be paved, to final grade. Surround frames set to grade with a ring of compacted asphalt concrete base material immediately after backfilling operations are complete. Place asphalt concrete mixture up to one (1) inch below top of frame, slope to grade, and compact with hand tamp.
- C. For H-25 load rated PVC inlets, a minimum 10 inch thick Class C concrete ring shall be poured under the grate as shown on the Drawings. Regardless of loading condition, no brick, stone, or concrete block shall be used to adjust inlets or catch basin grates or covers to final grade.

3.7 BRANCH CONNECTIONS

- A. In general, provision shall be made in the sewers for service connections by inserting a wye branch in the sewer at the location shown on the Drawings, where required or ordered, for each service connection with a branch size called for by the Drawings but never less than six (6) inch, for sewers ten (10) feet or less in depth. Where indicated on the plans, the Contractor shall construct a riser, as per detail, in such manner, that the top of the riser shall be not less than seven (7) feet below grade or at such elevation as to properly receive the required service connection, with full regard to elevation of service sewer and slope from building or structure to the sewer which shall not be less than one percent (1%).
- B. The approximate location of service connections are shown on the Drawings based upon available information. The Owner may increase the number of connections or delete some connections as the sewer is being built.
- C. Openings at the outer ends of the connections shall be closed and sealed with approved stoppers when connection is not immediately placed into service.

3.8 MAINTAINING FLOW

- A. The Contractor shall be required to maintain the flow in all existing live sewers during construction and the method employed shall be approved by the Engineer.

3.9 REPLACING, MOVING AND REPAIRING OF EXISTING UTILITIES

- A. The Contractor shall replace, move, support, or repair and maintain all pipes for water, steam, air or gas, and all wire conduit(s), and all other structures encountered in the work and repair all damage done to any of the said structures and appurtenances through his acts or neglect and shall keep them in repair during the life of the Contract. The Contractor shall in all cases leave them in as good condition as they were previous to the commencement of the work and to the full satisfaction of the Owner.

3.10 CONNECTION TO EXISTING SEWER SYSTEM

- A. The Contractor shall make connections to the existing sewer system as shown on the Drawings. The connections shall be made by the Contractor at such hours that will cause the least disturbance to the flow in the existing sewer system. The Contractor, however, shall notify the Engineer at least five working days in advance of the time he desires to make the connections and no such connections shall be made until the permission of the Engineer is obtained.

3.11 CLEAN-UP

- A. Before final acceptance for the Work, the Contractor shall clear the sewers of any mortar, dirt or other refuse that may have been left or accumulated in the sewers. All manholes and other structures shall be cleared of all forms, scaffolding, bulkheads, centering, surplus mortar, rubbish or dirt and left in a clean and proper condition.

3.12 DEFECTS TO BE MADE GOOD

- A. If, at any time before the completion of the contract, any broken pipes, or any defects, are found in the storm sewers or in any of their appurtenances, the Contractor shall cause the same to be removed and replaced by proper material and workmanship, without extra compensation for the labor and material required. All materials shall be carefully examined by the Contractor for defects before placing and any found defective shall not be placed in the line.

END OF SECTION