CONTRACT

THIS CONTRACT is between the CITY OF ANN ARBOR, a Michigan Municipal Corporation, 301 East Huron Street, Ann Arbor, Michigan 48104 ("City") and Fonson Company, Inc. ("Contractor") A Michigan corporation located at 7644 Whitmore Lake Road, Brighton, MI 48116. Based upon the mutual promises below, the Contractor and the City agree as follows:

ARTICLE I - Scope of Work

The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the project titled **WTP Lime Residual Removal Contract No. 1 – Site Modifications (RFP 25-15)** in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, all of which are incorporated as part of this Contract:

Non-discrimination and Living Wage Declaration of Compliance Forms (if applicable)
Vendor Conflict of Interest Form
Prevailing Wage Declaration of Compliance Form (if applicable)
Bid Forms
Contract and Exhibits
Bonds
General Conditions
Standard Specifications
Detailed Specifications
Plans
Addenda

ARTICLE II - Definitions

Administering Service Area/Unit means **Water Treatment Services Unit**

Project means **WTP lime Residual Removal Contract No. 1 – Site Modifications Project (RFP No. 25-15)**

Supervising Professional means the person acting under the authorization of the manager of the Administering Service Area/Unit. At the time this Contract is executed, the Supervising Professional is **Emily Schlanderer** whose job title is **WTP Engineer**. If there is any question concerning who the Supervising Professional is, Contractor shall confirm with the manager of the Administering Service Area/Unit.

Contractor's Representative means **Brendan Fons** whose job title is **Secretary**.

ARTICLE III - Time of Completion

(A) The work to be completed under this Contract shall begin immediately on the date specified in the Notice to Proceed issued by the City.

(B) The entire work for this Contract shall be completed within one-hundred fifty (150) consecutive calendar days.

(C) Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the Contractor to pay the City, as liquidated damages and not as a penalty, an amount equal to $500 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the City shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

ARTICLE IV - The Contract Sum

(A) The City shall pay to the Contractor for the performance of the Contract, the unit prices as given in the Bid Form for the estimated bid total of:

Three Hundred Eighty-Five Thousand Eight Hundred Twenty-Nine Dollars **($385,829.00)**

(B) The amount paid shall be equitably adjusted to cover changes in the work ordered by the Supervising Professional but not required by the Contract Documents. Increases or decreases shall be determined only by written agreement between the City and Contractor.

ARTICLE V - Assignment

This Contract may not be assigned or subcontracted any portion of any right or obligation under this contract without the written consent of the City. Notwithstanding any consent by the City to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under this contract unless specifically released from the requirement, in writing, by the City.

ARTICLE VI - Choice of Law

This Contract shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this Contract, the Contractor and the City agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this Contract. The parties stipulate that the venue referenced in this Contract is for convenience and waive any claim of non-convenience.

Whenever possible, each provision of the Contract will be interpreted in a manner as to be effective and valid under applicable law. The prohibition or invalidity, under applicable law, of any provision will not invalidate the remainder of the Contract.

ARTICLE VII - Relationship of the Parties

The parties of the Contract agree that it is not a Contract of employment but is a Contract to accomplish a specific result. Contractor is an independent Contractor performing services for the

City. Nothing contained in this Contract shall be deemed to constitute any other relationship between the City and the Contractor.

Contractor certifies that it has no personal or financial interest in the project other than the compensation it is to receive under the Contract. Contractor certifies that it is not, and shall not become, overdue or in default to the City for any Contract, debt, or any other obligation to the City including real or personal property taxes. City shall have the right to set off any such debt against compensation awarded for services under this Contract.

ARTICLE VIII - Notice

All notices given under this Contract shall be in writing, and shall be by personal delivery or by certified mail with return receipt requested to the parties at their respective addresses as specified in the Contract Documents or other address the Contractor may specify in writing. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; or (2) three days after mailing certified U.S. mail.

ARTICLE IX - Indemnification

To the fullest extent permitted by law, Contractor shall indemnify, defend and hold the City, its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney's fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this Contract, by the Contractor or anyone acting on the Contractor's behalf under this Contract. Contractor shall not be responsible to indemnify the City for losses or damages caused by or resulting from the City's sole negligence. The provisions of this Article shall survive the expiration or earlier termination of this contract for any reason.

ARTICLE X - Entire Agreement

This Contract represents the entire understanding between the City and the Contractor and it supersedes all prior representations, negotiations, agreements, or understandings whether written or oral. Neither party has relied on any prior representations in entering into this Contract. No terms or conditions of either party's invoice, purchase order or other administrative document shall modify the terms and conditions of this Contract, regardless of the other party's failure to object to such form. This Contract shall be binding on and shall inure to the benefit of the parties to this Contract and their permitted successors and permitted assigns and nothing in this Contract, express or implied, is intended to or shall confer on any other person or entity any legal or equitable right, benefit, or remedy of any nature whatsoever under or by reason of this Contract. This Contract may be altered, amended or modified only by written amendment signed by the City and the Contractor.

ARTICLE XI – Electronic Transactions

The City and Contractor agree that signatures on this Contract may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this Contract. This Contract may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

[Signatures on next page]

FONSONS COMPANY, INC.

By: _____

Name: Brendan Fons

Title: Secretary

Date: _____

CITY OF ANN ARBOR

By: _____

Name: Milton Dohoney Jr.

Title: City Administrator

Date: _____

Approved as to substance:

By: _____

Name: Jordan Roberts

Title: Public Services Area Administrator

Date: _____

Approved as to form:

By: _____

Name: Atleen Kaur

Title: City Attorney

Date: _____

(Signatures continue on following page)

CITY OF ANN ARBOR

By: _____

Name: Christopher Taylor

Title: Mayor

Date: _____

By: _____

Name: Jacqueline Beaudry

Title: City Clerk

Date: _____

E. Schedule of Pricing/Cost – 20 Points

Company: Fonson Company, Inc.

Project: WTP Lime Residual Removal Contract No. 1 – Site Modifications

Unit Price Bid –

Item No.	Item Description	Qty	Unit	Unit Price	Total Price
1	General Conditions (Max $20,000)	1	LS	$20,000.00	$20,000.00
2	Allowance – Force Main Repair	1	DLR	$50,000	$50,000
3	Allowance – Utility Relocation	1	DLR	$20,000	$20,000
4	Allowance – Permits	1	DLR	$5,000	$5,000
5	Allowance – Parking Lot Light	1	DLR	$10,000	$10,000
6	Minor Traffic Control	1	LS	$21,850.00	$21,850.00
7	Audiovisual Coverage	1	LS	$1,650.00	$1,650.00
8	Force Main Performance Testing	1	LS	$4,850.00	$4,850.00
9	WTP Site Modifications	1	LS	$77,500.00	$77,500.00
10	Lagoon Site Modifications	1	LS	$84,500.00	$84,500.00
11	Soil Erosion and Sedimentation Control	1	LS	$14,500.00	$14,500.00
12	Pavement Removal	80	SYD	$25.00	$2,000.00
13	Curb and Gutter Removal	250	LF	$12.00	$3,000.00
14	Sidewalk Removal	32	SYD	$22.00	$704.00
15	Fence Removal	80	LF	$11.00	$880.00
16	Gate Removal	1	EA	$350.00	$350.00
17	Curb, Conc, Det D2	25	LF	$70.00	$1,750.00
18	Curb, Conc, Det F4	12	LF	$70.00	$840.00
19	Sidewalk, 4-inch	165	SF	$13.00	$2,145.00
20	Sidewalk, 8-inch	125	SF	$16.00	$2,000.00
21	Driveway, Nonreinf Conc, 8 inch	22	SYD	$160.00	$3,520.00
22	8-inch Aggregate Base	275	SYD	$40.00	$11,000.00
23	HMA, 3C	50	Ton	$275.00	$13,750.00
24	HMA, 4C	25	Ton	$300.00	$7,500.00
25	Chain Link Fence and Gates	1	LS	$21,040.00	$21,040.00
26	Closeout	1	LS	$5,500.00	$5,500.00
TOTAL BASE BID (ITEMS 1 THROUGH 26)					$385,829.00

Total Base Bid: Three Hundred Eighty Five Thousand, Eight Hundred Twenty Nine Dollars and Zero Cents Dollars ($385,829.00)

(Amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.)

PERFORMANCE BOND

(1) _____ of _____ (referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for $, the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the City entitled _____ _____, for RFP No. _____ and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq.

(3) Whenever the Principal is declared by the City to be in default under the Contract, the Surety may promptly remedy the default or shall promptly:
(a) complete the Contract in accordance with its terms and conditions; or
(b) obtain a bid or bids for submission to the City for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, arrange for a Contract between such bidder and the City, and make available, as work progresses, sufficient funds to pay the cost of completion less the balance of the Contract price; but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth in paragraph 1.

(4) Surety shall have no obligation to the City if the Principal fully and promptly performs under the Contract.

(5) Surety agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder, or the specifications accompanying it shall in any way affect its obligations on this bond, and waives notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work, or to the specifications.

(6) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202_.

_____	_____
(Name of Surety Company)	(Name of Principal)
By _____	By _____
(Signature)	(Signature)
Its _____	Its _____
(Title of Office)	(Title of Office)
Approved as to form:	Name and address of agent:
_____	_____
Atleen Kaur, City Attorney	_____
	_____

LABOR AND MATERIAL BOND

(1) _____

of _____(referred to as "Principal"), and _____, a corporation duly authorized to do business in the State of Michigan, (referred to as "Surety"), are bound to the City of Ann Arbor, Michigan (referred to as "City"), for the use and benefit of claimants as defined in Act 213 of Michigan Public Acts of 1963, as amended, being MCL 129.201 et seq., in the amount of

$ _____, for the payment of which Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, by this bond.

(2) The Principal has entered a written Contract with the Cityentitled _____

_____

_____

____, for RFP No. _____; and this bond is given for that Contract in compliance with Act No. 213 of the Michigan Public Acts of 1963 as amended;

(3) If the Principal fails to promptly and fully repay claimants for labor and material reasonably required under the Contract, the Surety shall pay those claimants.

(4) Surety's obligations shall not exceed the amount stated in paragraph 1, and Surety shall have no obligation if the Principal promptly and fully pays the claimants.

(5) Principal, Surety, and the City agree that signatures on this bond may be delivered electronically in lieu of an original signature and agree to treat electronic signatures as original signatures that bind them to this bond. This bond may be executed and delivered by facsimile and upon such delivery, the facsimile signature will be deemed to have the same effect as if the original signature had been delivered to the other party.

SIGNED AND SEALED this _____ day of _____, 202_

_____	_____
(Name of Surety Company)	(Name of Principal)
By _____	By _____
(Signature)	(Signature)
Its _____	Its _____
(Title of Office)	(Title of Office)

Approved as to form:

Atleen Kaur, City Attorney

Name and address of agent:

GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the City and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

(1) Addenda in reverse chronological order; (2) Detailed Specifications; (3) Standard Specifications; (4) Plans; (5) General Conditions; (6) Contract; (7) Bid Forms; (8) Bond Forms; (9) Bid.

Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the City upon discovery, and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage Requirements

Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states "...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of

subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section.

Pursuant to Resolution R-16-469 all public improvement contractors are subject to prevailing wage and will be required to provide to the City payroll records sufficient to demonstrate compliance with the prevailing wage requirements. A sample Prevailing Wage Form is provided in the Appendix herein for reference as to what will be expected from contractors. Use of the Prevailing Wage Form provided in the Appendix section or a City-approved equivalent will be required along with wage rate interviews.

Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

If the Contractor is a “covered employer” as defined in Chapter 23 of the Ann Arbor City Code, the Contractor agrees to comply with the living wage provisions of Chapter 23 of the Ann Arbor City Code. The Contractor agrees to pay those employees providing Services to the City under this Contract a “living wage,” as defined in Section 1:815 of the Ann Arbor City Code, as adjusted in accordance with Section 1:815(3); to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing services under this Contract are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

Contractor agrees that all subcontracts entered into by the Contractor shall contain similar wage provision covering subcontractor’s employees who perform work on this contract.

Section 5 - Non-Discrimination

The Contractor agrees to comply, and to require its subcontractor(s) to comply, with the nondiscrimination provisions of MCL 37.2209. The Contractor further agrees to comply with the provisions of Section 9:158 of Chapter 112 of Title IX of the Ann Arbor City Code, and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the City harmless from loss on account of infringement except that the City shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the City has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The City shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.

Section 10 - Protection of the Public and of Work and Property

The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or

employees of the City. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The City shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the City shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.

Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The City may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be

executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

(1) When work under an extra work order is added to the work under this Contract;

(2) When the work is suspended as provided in Section 20;

(3) When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;

(4) Delays in the progress of the work caused by any act or neglect of the City or of its employees or by other Contractors employed by the City;

(5) Delay due to an act of Government;

(6) Delay by the Supervising Professional in the furnishing of plans and necessary information;

(7) Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section l3. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

(1) The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;

(2) The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

(3) If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;

(4) The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;

(5) Payments of all charges for work under this Section in any one month shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City's Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the City will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The City will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than l80 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2.

Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within l0 days after written notice, the City may remove them and, if the removed material has value, may store the material

at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the City may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the City the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the City under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the City within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the City:

(1) The consent of the surety to payment of the final estimate;
(2) The Contractor's Affidavit in the form required by Section 44.

In case the Affidavit or consent is not furnished, the City may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the City except those arising from:

(1) unsettled liens;
(2) faulty work appearing within 12 months after final payment;
(3) hidden defects in meeting the requirements of the plans and specifications;
(4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The City may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the

written notice from the City to the Contractor to do so. The City shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the City does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and the City's Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the City may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the City may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the City for any excess cost to the City. If the Contractor's right to proceed is terminated, the City may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the City, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The City may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of the Contract Sum, the Contractor and its surety are liable to the City for any excess cost incurred. The expense incurred by the City, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the City, terminate this Contract and recover from the City payment for all acceptable work executed plus reasonable profit.

Section 23 - City's Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the City, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the City may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the City, shall promptly remove any part or all of its equipment and supplies from the property of the City, failing which the City shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the City and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the City upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the City for damages to materials and equipment from any cause except negligence or willful act of the City. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. The Contractor shall assign all manufacturer or material supplier warranties to the City prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the City, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the City may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The City may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the City from loss on account of:

(1) Defective work not remedied;

(2) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;

(3) Failure of the Contractor to make payments properly to subcontractors or for material or labor;

(4) Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the City which will protect the City in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

(1) The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself and the City from all claims for bodily injuries, death or property damage that may arise under this Contract; whether the act(s) or omission(s) giving rise to the claim were made by the Contractor, any subcontractor, or anyone employed by them directly or indirectly. Prior to commencement of any work under this contract, Contractor shall provide to the City documentation satisfactory to the City, through City-approved means (currently myCOI), demonstrating it has obtained the required policies and endorsements. The certificates of insurance endorsements and/or copies of

policy language shall document that the Contractor satisfies the following minimum requirements. Contractor shall add registration@mycoitracking.com to its safe sender's list so that it will receive necessary communication from myCOI. When requested, Contractor shall provide the same documentation for its subcontractor(s) (if any).

Required insurance policies include:

(a) Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

Bodily Injury by Accident - $500,000 each accident
Bodily Injury by Disease - $500,000 each employee
Bodily Injury by Disease - $500,000 each policy limit

(b) Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 04 13 or current equivalent. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements specifically for the following coverages: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further there shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. The following minimum limits of liability are required:

$1,000,000	Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
$2,000,000	Per Project General Aggregate
$1,000,000	Personal and Advertising Injury
$2,000,000	Products and Completed Operations Aggregate, which, notwithstanding anything to the contrary herein, shall be maintained for three years from the date the Project is completed.

(c) Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 10 13 or current equivalent. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. The City of Ann Arbor shall be named as an additional insured. There shall be no added exclusions or limiting endorsements that diminish the City's protections as an additional insured under the policy. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

(d) Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

(2) Insurance required under subsection (1)(b) and (1)(c) above shall be considered primary as respects any other valid or collectible insurance that the City may possess, including any self-insured retentions the City may have; and any other insurance the City does possess shall be considered excess insurance only and shall not be required to contribute

with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the City for any insurance listed herein.

(3) Insurance companies and policy forms are subject to approval of the City Attorney, which approval shall not be unreasonably withheld. Documentation must provide and demonstrate an unconditional and un-qualified 30-day written notice of cancellation in favor of the City of Ann Arbor. Further, the documentation must explicitly state the following: (a) the policy number(s); name of insurance company(s); name and address of the agent(s) or authorized representative(s); name(s), email address(es), and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which may be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified Contractor shall furnish the City with satisfactory certificates of insurance and endorsements prior to commencement of any work. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) and all required endorsements to the City. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies and endorsements to the Administering Service Area/Unit at least ten days prior to the expiration date.

(4) Any Insurance provider of Contractor shall be authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company's Key Rating Guide of "A-" Overall and a minimum Financial Size Category of "V". Insurance policies and certificates issued by non-authorized insurance companies are not acceptable unless approved in writing by the City.

(5) City reserves the right to require additional coverage and/or coverage amounts as may be included from time to time in the Detailed Specifications for the Project.

(6) The provisions of General Condition 28 shall survive the expiration or earlier termination of this contract for any reason.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

(1) A Performance Bond to the City of Ann Arbor for the amount of the bid(s) accepted;
(2) A Labor and Material Bond to the City of Ann Arbor for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the City in a manner and by a Surety Company authorized to transact business in Michigan and satisfactory to the City Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the City or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the City.

Section 33 - Rights of Various Interests

Whenever work being done by the City's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the City. The approval will not be given until the Contractor submits to the City a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the City may require.

The Contractor shall be as fully responsible to the City for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the City may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the City.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the City or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.

Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the City unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the City, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the City's property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain City property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written City approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The City may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the City is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in City projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

Section 43

CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____, 20___, to _____, 20 , performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled _____, for which I shall ask, demand, sue for, or claim compensation or extension of time from the City, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

_____ _____
Contractor Date

By _____
(Signature)

Its _____
(Title of Office)

Past due invoices, if any, are listed below.

Section 44

CONTRACTOR'S AFFIDAVIT

The undersigned Contractor,_____, represents that on _____, 20___, it was awarded a contract by the City of Ann Arbor, Michigan to_____ under the terms and conditions of a Contract titled _____. The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the City of Ann Arbor.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the City of Ann Arbor.

This affidavit is freely and voluntarily given with full knowledge of the facts.

_____ _____
Contractor Date

By _____
(Signature)

Its _____
(Title of Office)

Subscribed and sworn to before me, on this _____ day of _____, 20__
_____ , _____ County, Michigan
Notary Public
_____ County, MI
My commission expires on:

STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Bid. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

Standard Specifications are available online:

http://www.a2gov.org/departments/engineering/Pages/Engineering-and-Contractor-Resources.aspx

DETAILED SPECIFICATIONS

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SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work covered by the Contract Documents comprises modifications to the existing Water Treatment Plant parking lot and two existing force main manholes, one located at the WTP and one at the municipal lime residual lagoon site, to accommodate Work being performed under Contract No. 2 for the City of Ann Arbor, Owner.

B. The Work includes the following major items:
   1. Modifications to Water Treatment Plant parking lot.
   2. Modifications to force main manhole at WTP stie.
   3. Modifications to force main manhole at municipal lime residual lagoon site.

1.3 TYPE OF CONTRACT

A. Construct the Work of this Contract under a single unit price Contract.

1.4 GENERAL

A. Imperative Language: These Specifications (Divisions 01 through 49) are written in the imperative and abbreviated form. This imperative language of the technical specifications is directed at Contractor unless specifically noted otherwise. Incomplete sentences shall be completed by inserting "shall", "shall be" and similar mandatory phrases by inference in the same manner as they are applied to notes on Drawings. The words "shall", "shall be" and similar mandatory phrases shall be supplied by inference where a colon (:) is used within sentences or phrases. Except as worded to the contrary, fulfill (perform) all indicated requirements whether stated in the imperative or otherwise.

B. Related Sections: Some Sections of these Specifications (Divisions 01 through 49) may include a paragraph titled "Related Sections". This paragraph is an aid to the Project Manual user and is not intended to include all Sections which may be related. It is Contractor's obligation to coordinate all Sections whether indicated under "Related Sections" or not.

1.5 WORK UNDER OTHER CONTRACTS

A. The Work described above will be executed as the WTP Lime Residual Removal – Contract No. 1 as indicated on the Drawings and described herein. Minimal overlap of Contract No. 1 and No. 2 is possible, but not anticipated.
   1. Contract No. 1 work is as described above.
   2. Contract No. 2 consists of the removal of lime residuals from the lagoon, hauling and disposal at off site locations. Processes to remove, dewater and prepare residuals for hauling and disposal will take place at both the Water Treatment Plant and lagoon sites.
   3. The Contract No. 1 work shall be substantially complete prior to the mobilization of the Contract No. 2 contractor. All work in the WTP parking lot, and work modifying and testing the force main must be complete.
   4. Anticipated Notice to Proceed dates, Contract Times, as well as liquidated damages are outlined in Article III of the Contract.

B. At all contract interfaces, contractors awarded the various contracts shall cooperate with other contractors meeting at that point, and shall schedule work so that in no way shall the operations of one contractor interfere with another. Delays created by situations involving two uncooperative contractors shall be considered the fault of the dispute between the concerned parties and shall not be passed on as a cost to Owner. Periodic meetings between the Contract No. 1 and Contract No. 2 contractors prior to commencement of Contract No. 2 may be required.

C. The Owner will have a project underway at the WTP during this Contract. The project is titled WTP Filters 18/20 Underdrain Replacement and will include filter modifications at the WTP site.

D. Coordinate the schedule of work under other contracts with Owner and other contractors.

E. Cooperate with all contractors performing work on the site.

F. Copies of Contract Documents for work under separate contracts are available for review upon request.

1.6 WORK SEQUENCE

A. Contractor shall arrange its work so that at no time shall it cause unnecessary interruption to the operation of existing facilities. Contractor shall prepare and submit to Engineer for approval, a complete detailed working schedule setting forth the sequence of operations Contractor proposes to follow.

1.7 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow for Owner occupancy and work by other contractors.

B. Coordinate use of premises under direction of the Owner.

C. Where the Contract Documents identify certain site elements within the construction limits, such as sidewalks, drives, and streets, that must be kept open for public or the Owner’s use during construction, the Contractor shall be responsible for protection and maintenance of such elements as well.

D. Keep driveways and entrances serving the premises clear and available to Owner, Owner's employees, and private property owners at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on Site. Areas for Contractor's trailers, equipment, and material storage, and Contractor's employee parking shall be as indicated on Drawings or agreed by Owner prior to the start of construction.

E. Except in connection with the safety or protection of persons or the Work or property at the Site or adjacent thereto, all Work at the site shall be restricted to the following hours:
   1. Monday Through Friday (Except Legal Holidays): 7 :00 a.m. to 7:00 p.m.
   2. Saturday, Sundays or legal holidays with written approval of the Owner.

F. Work Within Highway Rights-of-Way: In accordance with Division 01 Section “Regulatory Requirements.”

G. Private Easements:
   1. The Owner will arrange for the necessary easements required for construction across privately owned land. The Contractor shall carry on the construction in such a manner as to cause a minimum of inconvenience to the occupants of the properties.
   2. The Owner has obtained restricted easement agreements in some locations. The Contractor shall conduct the Contractor's operations on easements in such a manner as to comply with the conditions set forth in said easement agreements, which are on file with the Owner. All easement conditions noted shall be accomplished by the Contractor's and shall be included in the Contract Price. The Contractor shall limit the Contractor's operations to the time of year or time of week required on certain easements, as noted in the Contract Documents.

1.8 OCCUPANCY REQUIREMENTS

A. Owner Occupancy During Construction:
   1. The Owner will occupy or utilize premises during entire period of construction. Cooperate with the Owner to minimize conflict and to facilitate the Owner's operations. Perform the Work so as not to interfere with OWNER's operations.
   2. Access to Abutting Properties: Provide at all times.
   3. Access for Emergency Vehicles:
      a. Provide at all times.
      b. Provide at least one clear lane during nonwork periods.
   4. Fire Hydrants: Provide access to at all times.
   5. Do not block fire access routes.
   6. Detours and Street Closure:
      a. When provided for in the Contract Documents or approved by the Owner.
      b. Routes and barricades as indicated or as approved by road authority.
   7. Limit parking for construction vehicles to an area as indicated on the Drawings.

1.9 CONFINED SPACE

A. The force main manholes and some locations on the WTP site are considered Non-Permitted Confined Spaces. The Contractor must meet all requirements of MIOSHA for working in confined spaces. The Contractor must submit a confined space entry program to the Owner for record, before any work is started in the area.

1.10 SECURITY AND ACCESS

A. The WTP and lime residual lagoon are limited access facilities. The Contractor must comply with the Owner's operational provisions for security including, but not limited to:
   1. Provide proper identification of employees.
   2. Provide and use photos IDs for all Contractor personnel.
   3. Maintain daily sign-in log of personnel and visitors.
   4. Provide a list of personnel and vehicles on site.
   5. Maintain a daily log of vehicle license plate numbers on site.
   6. Allow Owner to conduct background checks on Contractor's personnel upon request.
   7. Notify the plant in advance of material deliveries to the site, including delivery contents.
   8. These procedures may be revised by the Owner at any time, as needed.

B. Use of Owner's security measures does not relieve Contractor of its responsibility to secure its own working spaces and materials.

C. Access to Site, Roadways, and Parking Areas:
   1. The Contractor shall be responsible for providing access to the construction area and for preparing and maintaining temporary access road, fence, and/or gate, as needed. Contractor's personnel shall park on approved City streets adjacent to WTP and shall not park on the plant site outside of areas designated on the Drawings. Contractor's personnel may park on the lagoon site.
   2. The Contractor shall be responsible for removal of snow in areas of the Contractor's work.

1.11 GUARANTEE

A. The Contractor shall be present for a site inspection before the warranty expires. At this time, the Owner will develop a punch list of deficiencies to be addressed by the Contractor. The Contractor shall address these items within 14 days of the inspection.

1.12 PERMITS

A. The Contractor must follow the requirements established by all permits necessary for construction of this Project. The following is a list of all permits that must be obtained prior to the beginning of construction.
   1. Right-of-Way Permit: City of Ann Arbor.
      a. Contractor is required to obtain a permit from the City of Ann Arbor should any part of project mobilization or project activities interfere with traffic on a City street. The permit fee shall be paid for by Allowance. Contractor must coordinate installation of no parking measures with the City Engineering Department.
   2. Soil Erosion Control Permit: City of Ann Arbor.
      a. The Soil Erosion Control Permit shall be applied for by the Contractor. The Contractor shall be required to obtain the permit, pay all associated fees and adhere to all requirements of the permit as part of the bid item for that work.
   3. Building Permit: City of Ann Arbor.
      a. The City of Ann Arbor Building Permit shall be applied for by the Contractor. The plan review fee shall be paid for by Allowance. The Contractor shall be required to obtain the permit, pay all associated fees and adhere to all requirements of the permit. The Contractor must submit a copy of the permit to the Owner and Engineer prior to construction.

1.13 MISCELLANEOUS PROVISIONS

A. Contractor shall notify all owners of public utilities within the right-of-way or easement for the purpose of establishing the approximate locations of the utilities in accordance with the requirements of Act No. 53 Public Acts of 1974 of the State of Michigan. Contractor shall notify MISS DIG-Utility Communication System, 1-800-482-7171 or 811, three working days prior to starting any excavation with power equipment.

B. Contractor shall be responsible for verifying the location of all underground utilities by magnetic or other type instruments before beginning excavation Work.

C. Time and Sequence of Work: In general, it is the intention and understanding that Contractor shall have control over the sequence or order of execution of the several parts of the Work to be done under the Contract and over the method of accomplishing the required results, except as some particular sequence or method may be distinctly demanded by the Drawings and Project Manual or by the expressed provisions of the Contract. Engineer may, however, make such reasonable requirements as may, in Engineer's judgment, be necessary for the proper and effective protection of Work partially or wholly completed, and to these requirements Contractor shall conform.

PART 2 - PRODUCTS

2.1 OTHER MATERIALS

A. General: All other materials which are not specified herein and are not indicated on the Drawings, but are required for proper and complete performance of the Work.

B. Procedure:
   1. Select new, first quality material.
   2. Obtain Engineer's review.
   3. Provide and install.

PART 3 - EXECUTION

3.1 CONTROL OF WATER POLLUTION

A. General Requirements:
   1. The Contractor shall conduct its work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemical, sewage or other harmful materials into the City’s water supply or on to the soil.
   2. The Contractor shall take all necessary precautions to prevent the entry of these harmful materials including the use of tarps, planks, protective trusses or scaffolding systems, or other Owner and Engineer approved methods.

3. Any vehicles or equipment with oil, fuel, or other fluid leaks shall not be allowed on the site and shall be immediately removed upon detection.
4. The Contractor shall monitor provisions to reduce the spread of filtrate and all erosion control best management practices during pipeline flushing activities at the lagoon site. The existing stormwater basin may be utilized as an area to flush, and Contractor will be responsible for a complete cleanup of all lime residuals and any repairs to the basin.

END OF SECTION 01 11 00

SECTION 01 21 13 – CASH ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section provides for cash allowances which are included in the Contract Price.

B. Related Sections include Sections in Divisions 01 through 49, as identified below, provide additional information on what is covered by the respective allowances.

1.3 SCHEDULE OF ALLOWANCES

A. Include in the Contract Price the following amounts:
   1. The amount of $50,000 for payment of force main repairs. Should the pressure testing of the existing force main reveal there is unacceptable leakage of the existing force main pipe installed under previous contract, Contractor shall provide the equipment, labor and materials to perform additional testing designed to isolate the location of the leakage, and to ultimately make the repair to the line so that is passes the test. Work shall be recorded on a time and materials basis, with amounts tracked so that costs do not exceed the amount of the Allowance. Contractor is responsible for informing the Engineer if the defects found in the existing line cannot be repaired using the funds allotted in the Allowance prior to beginning actual repair work on the force main.
   2. The amount of $20,000 for payment of the permanent relocation of any existing utilities, including WTP yard piping, which are in conflict with the proposed work and need to be relocated rather than built around shall be included in the Contract Price for this Work. This Allowance includes time, material, installation and labor costs associated with relocating the existing utilities. Contractor is responsible for all contact and correspondence with the owner of utility to complete the relocation.
   3. The amount of $5,000 for payment of fees related to permits not already procured by the Owner. Contractor is responsible for all contact and correspondence with the permitting agency to complete the application for and obtain the necessary permits.
   4. The amount of $10,000 for removal of the existing parking lot light, foundation, conduit and wiring and installation of a new light, pole and foundation and connection to existing wiring. Contractor shall provide the equipment, labor and materials to complete the work.

1.4 CASH ALLOWANCES

A. Costs Associated With Allowances:
   1. All costs, associated with allowances, which are not specifically defined in the Schedule of Allowances, Paragraph 1.3 of this Section shall be included in the Base Bid.
   2. Associated costs not specifically defined in the Schedule of Allowances may include, but are not necessarily limited to:
      a. Unloading.
      b. Handling on the Site.
      c. Labor.
      d. Installation.
      e. Overhead.
      f. Profit.

1.5 ADJUSTMENT OF COSTS

A. Change Order: To adjust Contract Price if final cost is different from allowance.

B. Documentation:
   1. Submit:
      a. Within 60 days after completion of the work under the allowance.
      b. Documentation of actual costs.
   2. Failure to submit claims within the designated time will constitute a waiver of claims for additional costs.
   3. At Contract closeout, reflect all approved changes in Contract amounts in the final statement of accounting.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 21 13

SECTION 01 22 00 - UNIT PRICES - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes descriptions of the method of measurement and the basis of payment for Unit Price Work under this Contract.

B. Basis of Contract Payments:
   1. Final Contract Price shall be determined by actual quantities installed at unit prices stated in Contractor's Bid.
   2. Engineer shall determine actual as-built quantities.
   3. All work identified on the Drawings, but not included as a Bid item shall be considered incidental to construction and not paid for directly, except Work that would be considered additional Work due to unforeseen conditions.
   4. Unit price payments for individual items shall include everything necessary for such item to function as intended in the system.
   5. Owner reserves the right to increase, decrease or eliminate any quantities for items listed in Contractor's Bid or which become a part of the Contract Documents.

C. Michigan Department of Transportation (MDOT):
   1. Where items of Work are identified with MDOT pay item codes on Bid Form, measurement and payment for these items shall be in accordance with Section 109 of the MDOT 2020 Standard Specifications for Construction, and as specified herein.
   2. Refer to individual MDOT Standard Specifications, Special Provisions, and Supplemental Specifications for information on procedures on how the Work will be measured and paid for, and detailed requirements for the Work described under each unit price.

D. Definitions:
   1. Average End Area: Average end area shall be the cross-sectional area determined perpendicular to the long axis of work being measured (the end area). End areas shall be determined within 50 feet of each end of the Work and in no more than 100-foot intervals. Total volume shall be determined by multiplying each end area by the length of Work to which it applies.
   2. Actual Area, for Square Yard and Square Foot Measurements: For rectangular or trapezoidal areas, the average width multiplied by the length. Irregularly shaped areas shall be broken into roughly rectangular or triangular shapes for measurement.
   3. Field Survey: For large areas to be measured for the above two methods, Engineer may elect to have the area determined by field survey using electronic data collection, and the area determined based on a plot of the data. Contractor will be provided with a copy of the plot and survey data.
   4. Truck Load Tickets: For unit price items paid by the ton, scales used must be currently certified by MDOT for use on state projects. Contractor shall provide Engineer with copies of certification. Load tickets must show date, time, material, load weight, tare weight, and net weight, and be mechanically or computer printed. Handwritten tickets shall not be accepted.

E. Items included as incidental to Unit Prices for systems and appurtenances. Unless there is a specific pay item identified, the unit price payment shall include, but not be limited to:
   1. Coordination of, and cooperation with, other contractors, agencies, departments, and utilities.
   2. Clear, excavate, trench, bedding, trench backfill, compaction, disposal of items for clearing and unsuitable or excess excavated materials.
   3. Drainage of excavations including by-pass pumping of sewers if necessary.
   4. Temporary sheeting, bracing and shoring of excavations.
   5. Support, relocation, replacement, connection or reconnection of existing pipelines and utilities.

6. Cleanup and surface restoration.
7. Water service repair.
8. Sewer lead repair.
9. Bulk head of pipes to be abandoned.
10. Removal of pipes, valves, structures and appurtenances located within the excavation limits of new utilities whether identified on the Drawings or not.
11. Coordination of mail delivery and refuse removal with residents, post office, and refuse collectors.
12. Support of utility poles and existing underground utilities during excavation and installation of sanitary sewer, water main and storm sewer.
13. Remove, salvage, and replace street signs.
14. Remove and dispense of trees less than 6 inches in diameter.
15. Maintaining drainage.
16. Maintaining driveways drive openings, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes coordination of hose piping and temporary ramps.
17. Storing all materials and equipment off lawn areas.
18. Site clean-up.
19. Furnishing and operating vacuum-type utility structure cleaning equipment.
20. Noise and dust control.
21. All miscellaneous and incidental items such as overhead, insurance, and permits.
22. Meeting all requirements relating to City of Ann Arbor prevailing wage rates, Debarment Certification, Davis Bacon Act, and providing the necessary documentation.

1.3 GENERAL CONDITIONS

A. Item No. 1 – General Conditions (Max $20,000):
   1. Includes:
      a. Provide insurance, bonds, and other costs associated with the Project in general and not included in other pay items.
      b. All required submittals.
      c. Coordination of, and cooperation with, other contractors, agencies, departments, and utilities.
      d. Protection and maintenance of utilities.
      e. Placing, maintaining, and removing all soil erosion and sedimentation controls, including stone inlets filers (as indicated on Drawings).
      f. Maintaining drainage.
      g. Maintaining driveways drive openings, sidewalks, bike paths, mail deliveries, and solid waste/recycle pick-ups. This includes coordination of hose piping and temporary ramps.
      h. Storing all materials and equipment off lawn areas.
      i. Site clean-up.
      j. Furnishing and operating vacuum-type utility structure cleaning equipment.
      k. Noise and dust control.
      l. Mobilization(s) and demobilization(s).
      m. All miscellaneous and incidental items such as overhead, insurance, and permits.
   2. Unit of Measure:
      a. Lump sum.
      b. Percentage of total amount prorated monthly for the duration of the Project.
      c. Final payment will be made at the final pay application.

B. Item No. 2 – Allowance – Force Main Repair:
   1. Includes cash allowance for testing requirements in accordance with Division 01 Sections “Cash Allowances” and “Testing Services for Buried Utilities, Roadways, and Site Projects.”
   2. Unit of Measure:
      a. Actual dollars paid to complete existing force main repairs.
      b. General Contractor allowable markup is 10%.
      c. Documented by invoices.

C. Item No. 3 – Allowance – Utility Relocation:
   1. Includes cash allowance for utility relocation in accordance with Division 01 Section “Cash Allowances.”
   2. Unit of Measure:
      a. Actual dollars paid to complete utility relocation work.
      b. General Contractor allowable markup is 10%.
      c. Documented by invoices.

D. Item No. 4 – Allowance – Permits:
   1. Includes cash allowance for permit fees in accordance with Division 01 Section “Cash Allowances.”
   2. Unit of Measure:
      a. Actual dollars paid to obtain permit.
      b. General Contractor allowable markup is 10%.
      c. Documented by invoices.

E. Item No. 5 – Allowance – Parking Lot Light:
   1. Includes cash allowance for parking lot light replacement in accordance with Division 01 Section “Cash Allowances.”
   2. Unit of Measure:
      a. Actual dollars paid to replace the parking lot light.
      b. General Contractor allowable markup is 10%.
      c. Documented by invoices.

F. Item No. 6 – Minor Traffic Control:
   1. Includes the following in accordance with Division 01 Section “Temporary Facilities and Controls:”
   2. Furnish, install, and maintain:
      a. Flag control.
      b. Detour signing.
      c. Work zone signing.
      d. Traffic control devices including barricades and barrels.
      e. Removal of conflicting pavement markings.
      f. Temporary pavement markings.
      g. Maintain access to residential driveways.
      h. Maintain access to commercial driveways.
   3. Unit of Measure:
      a. Lump sum.
      b. 50% payment shall be made for installation of traffic control devices.
      c. 50% payment shall be made after removal of traffic control devices.

G. Item No. 7 – Audiovisual Coverage:
   1. Includes the following in accordance with Division 02 Section “Preconstruction Audio-Visual Documentation:”
      a. All hard drives.
      b. Reports.
   2. Unit of Measure:
      a. Lump sum.
      b. Payment will be made after the Engineer has reviewed the audio-video documentation for completeness.

H. Item No. 8 – Force Main Performance Testing:
   1. Includes all labor, equipment, and materials and the following in accordance with Division 33 Section “Site Process Piping Systems:”
      a. Swab/pig the modified existing force main.
      b. Flush the modified existing force main.
      c. Pressure test the modified existing force main.
      d. Remove and dispose pig and all debris flushed from line in stormwater basin.
   2. Unit of Measure: Lump sum.

I. Item No. 9 – WTP Site Modifications:
   1. Includes, but is not limited to, all equipment, materials and labor to construct the WTP site modifications as indicated in the details in the Drawings and the following:
      a. Protective fencing.
      b. Stripping and storage of topsoil and sod.
      c. Curb cut for temporary drive.
      d. Grading for temporary driveway and pavement.
      e. Tree removal and relocation.
      f. Force main manhole modifications.
      g. Replacement of catch basin cover.
      h. Installation of new piping connection and associated excavation, backfilling, plugs, dewatering, piping, valves, concrete, and bollards.
      i. Restoration.
      j. Pavement markings.
   2. Unit of Measure: Lump sum.

J. Item No. 10 – Lagoon Site Modifications:
   1. Includes, but is not limited to, all equipment, materials and labor to construct the lagoon site modifications as indicated in the details in the Drawings and the following:
      a. Protective fencing.
      b. Installation of new piping connection and associated excavation, backfilling, plugs, dewatering, piping, valves, concrete, and connections to existing force main.
      c. Grading for and installation of temporary driveway and work area.
      d. Tree removal and relocation.
      e. Rip rap.
      f. Restoration.
   2. Unit of Measure: Lump sum.

K. Item No. 11 – Soil Erosion and Sedimentation Control:
   1. Includes the following in accordance with Division 31 Section “Erosion and Sedimentation Controls:”
      a. Complete and submit for approval a detailed Soil Erosion and Sedimentation Control Plan based on the planned operations of the selected methods for completing the Project utilizing the provided construction site plan as a basis.
      b. Install and maintain the required soil erosion and sedimentation control measures as indicated on the Drawings and any other measure necessary to adequately control soil erosion and sedimentation on the Project.
      c. Submit copies of product information for all SESC BMPs.
      d. Submit Certificate of Certified Storm Water Operator.
      e. Organize and preside over SESC Preconstruction Meeting.
      f. Sweep and clean roadways and sidewalks as required.
      g. Maintain dust control.
      h. Maintain silt fence, catch basin inlet filters, gravel access drive, turbidity curtain and all other BMPs as required.
      i. Clean new catch basins and storm sewers at the completion of construction if needed.
      j. Clean exiting catch basins and storm sewers near Project if impacted by construction.
      k. Remove temporary soil erosion and sedimentation control measures not needed for Contract No. 2 after site is stabilized.
   2. Unit of Measure:
      a. Lump sum.
      b. 50% payment shall be made for installation of soil erosion and sedimentation control measures.
      c. 50% payment shall be made upon project completion after removal of soil erosion and sedimentation control measures.
      d. Payment for SESC measures beyond those identified on the Drawings required by Contractor’s operations will not be considered for additional payment.
      e. Payment for additional SESC measures required by Engineer will be administered through the Change Order process.

L. Item No. 12 – Pavement Removal:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Square yard.

M. Item No. 13 – Curb and Gutter Removal:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear foot.

N. Item No. 14 – Sidewalk Removal:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Square yard.

O. Item No. 15 – Fence Removal:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear foot.

P. Item No. 16 – Gate Removal:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Each.

Q. Item No. 17 – Curb, Conc, Det D2:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear Foot.

R. Item No. 18 – Curb, Conc, Det F4:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear Foot.

S. Item No. 19 – Sidewalk, 4-inch:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear foot.

T. Item No. 20 – Sidewalk, 8-inch:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Linear foot.

U. Item No. 21 – Driveway, Nonreinf Conc, 8-inch:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Square yard

V. Item No. 22– 8-inch Aggregate Base:
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Square yard.

W. Item Nos. 23–24 – HMA (type per Bid form):
   1. In accordance with MDOT standard specifications.
   2. Unit of Measure: Ton.

X. Item No. 25 – Chain Link Fence and Gates:
   1. Includes all labor, materials, and equipment needed to accomplish this work and the following as indicated on the Drawings and in accordance with Division 32 Section “Chain Link Fences and Gates:”
      a. Installation of concrete bases and posts.
      b. Installation of fence and barbed wire.
      c. Installation of swing gate.
      d. Installation of slide gate.
   2. Unit of Measure: Linear foot. As measured along fence to outside edges of posts for the types and sizes listed on Bid Form.

Y. Item No. 26 – Closeout:
   1. Includes:
      a. Removal of equipment from Site.
      b. Removal of temporary facilities from Site.
      c. Completion of all restoration.
      d. Drawing redlines.
      e. All required submittals.
   2. Unit of Measure:
      a. Lump sum.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 22 00

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedures for modifying the Contract Documents.

1.3 BULLETIN

A. Procedures: As indicated on the form following this Section.

B. If Bulletin is accepted, Owner may issue one or more Change Orders for some or all items listed.

1.4 FIELD ORDER

A. Changes in Contract Price or Contract Times not permitted by use of Field Orders.

B. Format:
   1. May take form of any written communication mutually acceptable to Engineer and Contractor, including, but not necessarily limited to:
      a. Letter or memo.
      b. Email correspondence.
      c. Hand drawn or computer generated sketch.

C. Procedures: Refer to the General Conditions.

1.5 WORK CHANGE DIRECTIVE

A. Procedures: Refer to the General Conditions and form following this Section.

1.6 CHANGE ORDER

A. Procedures: Refer to the General Conditions and City standard form.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 SCHEDULES

A. Attached are the following forms:
   1. Bulletin.
   2. Work Change Directive.

BULLETIN
PAGE 1 OF 2

BULLETIN NO.:
DATE:
DUE DATE:

CONTRACT FOR:

OWNER:

CONTRACTOR:

ENGINEER:

DRAWING REVISION NO.:

ISSUED HEREWITH:

SPECIFICATION SECTIONS:

SKETCHES:

SHEETS:

The items below are being considered as possible changes to the Contract Documents for this Project. Contractor is requested to submit changes in cost, if any, for each item and indicate whether it is an addition to or deduction from the Contract Price. Costs are requested as lump sums unless otherwise noted as a unit cost. Include all labor, materials, overhead and profit, trades, subcontractors, and related costs. After reviewing the effects of those changes in the Work, Owner may issue a Change Order specifying which changes are to be incorporated in the Work, if any.

This Bulletin is not a Change Order and is not to be deemed authorization to proceed with the changes listed.

Additional work or materials, where proposed, shall meet the requirements of the Contract Documents, except where noted.

Contractor will be responsible for notifying Engineer, in writing, concerning any revision or clarification which causes a change in the Contract Documents, but not specifically mentioned as a cost item in this Bulletin.

Contractor shall return one (1) completed and signed copy of the Bulletin to Engineer on or before the due date noted above.

Each proposed change has been described briefly with additional information provided concerning detailed changes required for the major trades concerned. Only one total cost figure has been requested for each item on the Bulletin; however, a complete breakdown is required for each item as supporting documentation. This will allow Owner to more easily evaluate the proposed cost changes. Each Bulletin item is an all-inclusive item and may concern work from several trades or Subcontractors. It is Contractor's responsibility to ensure that all work for each item has been included in the total cost figure provided to Owner.

BULLETIN
PAGE 2 OF 2

ITEM NO. 1: < insert topic here >

Section: XXXXX – Section Name < issued/reissued/not reissued >

A. < >

ADD/DEDUCT: $ _____

ITEM NO. 2: < insert topic here >

Section: XXXXX – Section Name < issued/reissued/not reissued >

A. < >

ADD/DEDUCT: $ _____

ITEM NO. 3: < insert topic here >

Sheet: XXXXX – Sheet Name < issued/reissued/not reissued >

A. < >

ADD/DEDUCT: $ _____

ITEM NO. 4: < insert topic here >

Sheet: XXXXX – Sheet Name < issued/reissued/not reissued >

A. < >

ADD/DEDUCT: $ _____

Contractor:

_____
Signature

_____
Name and Title of Signatory

_____
Date

END OF BULLETIN

WORK CHANGE DIRECTIVE
PAGE 1 OF 1

WORK CHANGE DIRECTIVE NO.
DATE OF ISSUANCE:
EFFECTIVE DATE:

CONTRACT FOR:
OWNER:
CONTRACTOR:
ENGINEER:
ATTACHMENTS:
CONTRACTOR IS DIRECTED TO PROCEED PROMPTLY WITH THE FOLLOWING CHANGE(S) IN THE CONTRACT DOCUMENTS:

Authorization for Work described herein to proceed on the basis of Cost of the Work due to:

- ☐ Nonagreement on pricing of proposed change.
- ☐ Necessity to expedite Work described herein prior to changes on Contract Price and Contract Time.

Estimated change in Contract Price and Contract Times:

Contract Price _____ (increase/decrease) Contract Time (Days) _____ (increase/decrease)

Recommended for
Approval by Engineer: _____ Date: _____

Authorized for Owner by: _____ Date: _____

Received for Contractor by: _____ Date: _____

Received by
Funding Agency (if applicable): _____ Date: _____

END OF WORK CHANGE DIRECTIVE

WORK CHANGE DIRECTIVE INSTRUCTIONS

A. GENERAL INFORMATION:

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Times. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Times, a Field Order may be used.

B. COMPLETING THE WORK CHANGE DIRECTIVE FORM:

Engineer initiates the form, including a description of the items involved and attachments.

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer alone does not have authority to authorize changes in Price or Times. Once authorized by Owner, a copy should be sent by Engineer to Contractor.

Once the Work covered by this directive is completed or final cost and times are determined, Contractor should submit documentation for inclusion in a Change Order. Price and Times may only be changed by Change Order signed by Owner and Contractor with Engineer's recommendation.

This is a directive to proceed with a change that may affect the Contract Price or the Contract Times. A Change Order, if any, should be considered promptly.

END OF SECTION 01 26 00

SECTION 01 29 16 –PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes submittal to the Owner's designee of Applications for Payment and supporting documentation as specified herein.

1.3 OWNER'S INSTRUCTIONS

A. Payment will only be made for items listed on the Bid Form. The costs for other work required for a complete Project will be included in the prices bid for the other items of work listed on the bid form.

B. Payment for each item will be in accordance with Section 16 of the General Conditions, and include all applicable labor, material, equipment, and ancillary items to complete the work as specified.

C. All measurements shall be rounded to the nearest whole unit.

1.4 APPLICATIONS FOR PAYMENT

A. Initial Application for Payment: Administrative actions and submittals that must precede submittal of the first Application for Payment include the following:
   1. List of Subcontractors.
   2. List of principal suppliers and fabricators.
   3. Schedule of Values.
   4. Contractor's Construction Schedule (preliminary if not final).
   5. Schedule of principal products.
   6. Submittal schedule (preliminary if not final).

B. Applications For Payment:
   1. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
   2. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.
   3. The date for each progress payment will be determined at the Preconstruction Conference. The period of construction Work covered by each Application for Payment is 1 month. Actual start/end dates will be determined at the Preconstruction Conference.
   4. Use the AIA (American Institute of Architects) Application and Certification for Payment form for Applications for Payment.
   5. Complete every entry on the form, including execution by person authorized to sign legal documents on behalf of Contractor. Incomplete applications will be returned without action.
   6. Entries shall match data on Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
   7. Include amounts of Change Orders and Work Change Directives issued prior to the last day of the construction period covered by the application.
   8. Contractor's Declaration.
   9. Submit 1 executed copy of each Application for Payment to ENGINEER; each copy shall be complete, including waivers of lien and similar attachments, when required.
   10. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to Engineer.

C. Application for Payment at Substantial Completion:
   1. Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
   2. Administrative actions and submittals that shall proceed or coincide with this application include:
      a. Warranties (guarantees) and maintenance agreements.
      b. Maintenance instructions.
      c. Final cleaning.
      d. Application for reduction of retainage and consent of surety.
      e. Final progress photographs.
      f. List of incomplete Work, recognized as exceptions to Engineer's Certificate of Substantial Completion.

D. Final Payment Application: Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
   1. Completion of Project closeout requirements.
   2. Completion of items specified for completion after Substantial Completion.
   3. Transmittal of required Project construction records to Owner.
   4. Proof that taxes, fees, and similar obligations have been paid.
   5. Removal of temporary facilities and services.
   6. Removal of surplus materials, rubbish, and similar elements.
   7. Contractor’s Affidavit.
   8. Contractor's waivers of mechanics liens for Project.
   9. Consent of surety for final payment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 29 16

SECTION 01 31 13 – PROJECT COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
   1. Scheduling:
      a. Coordination of Work under this Contract.
      b. Administrative and supervisory personnel.
   2. Land survey work.
   3. Preconstruction Conference.
   4. Progress meetings.
   5. General installation provisions.

1.3 GENERAL COORDINATION

A. Coordinate scheduling, submittals and work of the various Sections of the Specifications to:
   1. Ensure efficient and orderly sequence of installation of interdependent construction elements.
   2. Provide for items to be installed later.

B. Interrelated Operating Equipment:
   1. Verify that characteristics of elements are compatible.
   2. Coordinate work of various sections having interdependent responsibilities for:
      a. Installation.
      b. Connection.
      c. Placing in service.

1.4 SCHEDULING

A. Coordinate construction operations included under different Sections of the Specifications that are dependent upon each other for proper installation, connection, and operation. Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair. Make adequate provisions to accommodate items scheduled for later installation.

B. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at Site in accordance with Laws or Regulations. Contractor shall train Contractor's employees on use of these sheets and shall keep a master copy on hand at Site.

C. Coordination with Other Contractors:
   1. Contractor shall so conduct Contractor's operations as not to interfere with or injure the work of other contractors or workers employed on adjoining or related Work, and Contractor shall promptly make good any injury or damage which may be done to such work by Contractor or Contractor's employees or agents.
   2. Should a contract for adjoining Work be awarded to another contractor, and should the work on one of these contracts interfere with that of the other, Engineer shall decide which contract shall cease work for the time being and which shall continue, or whether work on both contracts shall continue at the same time and in what manner.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project closeout activities.

1.5 PRECONSTRUCTION CONFERENCE

A. Engineer will schedule a Preconstruction Conference and organizational meeting at the Site or other convenient location prior to commencement of construction activities to review responsibilities and personnel assignments.

B. Attendees: Owner, Engineer and Engineer's consultants, Contractor and its superintendent, major Subcontractors, Manufacturers, Suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:
   1. Tentative construction schedule.
   2. Critical Work sequencing.
   3. Designation of responsible personnel.
   4. Procedures for processing field decisions and change orders.
   5. Procedures for processing Applications for Payment.
   6. Distribution of Contract Documents.
   7. Submittal of shop drawings, product data, and samples.
   8. Preparation of record documents.
   9. Use of the premises.
   10. Office, work, and storage areas.
   11. Equipment deliveries and priorities.
   12. Safety procedures.
   13. First aid.
   14. Security.
   15. Housekeeping.
   16. Working hours.

1.6 PROGRESS MEETINGS

A. Attendees: In addition to representatives of Owner and Engineer, each Subcontractor, Supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

B. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

C. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

D. Reporting: Engineer will prepare and distribute copies of minutes of the meeting to each party present and to other parties who should have been present. The minutes will include a brief summary, in narrative form, of progress since the previous meeting and report.

E. Schedule Updating: Contractor shall revise Construction Schedule after each progress meeting where revisions to schedule have been made or recognized. Issue revised schedule no later than 3 days after the progress meeting date to Engineer for distribution concurrently with the progress meeting minutes.

1.7 ACCEPTANCE OF CONDITIONS

A. Inspection:
   1. Prior to performing any work under a section:
      a. Carefully inspect the installed work.
      b. Verify that all such work is complete to the point where the work under that Section may properly commence.
      c. Starting of work indicates acceptance of the condition of components to which the work will be applied.
   2. Verify that all materials, equipment and Products to be installed under a Section may be installed in strict accordance with the original design and reviewed Shop Drawings.

B. Discrepancies:
   1. Resolve all discrepancies and conflicts between the trades.
   2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 LAND SURVEY WORK

A. Engineer will:
   1. Identify existing control points and property line corner stakes and will furnish one set of suitable base lines and reference elevations for various parts of the Work to be maintained and preserved by Contractor.
   2. Structures: Establish a minimum of 2 permanent benchmarks on Site, referenced to data established by survey control points.
   3. Sewers and Water Mains: Establish a minimum of 2 permanent benchmarks on Site, referenced to data established by survey control points. Additional benchmarks will be placed on Site if these permanent benchmarks cannot be referenced from other areas of the Work.

B. Contractor Performance:
   1. Furnish stakes and such suitable labor and assistance as Engineer may require in setting survey work.
   2. Be responsible for costs by Engineer for providing:
      a. Additional or replacement staking of original control points established by Engineer.
      b. Replacements of Site benchmarks established by Engineer.
   3. Verify layout information indicated on Drawings, in relation to the property survey and existing benchmarks before proceeding to layout the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
      a. Record benchmark locations, with horizontal and vertical data, on Contract Record Documents.
   4. Working from lines and levels established by Engineer, establish benchmarks and markers to set lines and levels at each area of Work and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
   5. Benchmarks or control points shall not be changed or relocated without prior written approval by Engineer. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

6. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
7. Advise entities engaged in construction activities, of marked lines and levels provided for their use.
8. As construction proceeds, check every major element for line, level and plumb.
9. Site Improvements: Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes, and invert elevations by instrumentation and similar appropriate means.
10. Building Lines and Levels: Locate and lay out batter boards for structures, building foundations, column grids and locations, floor levels, and control lines and levels required for mechanical and electrical Work.
11. Existing Utilities and Equipment:
    a. The existence and location of underground and other utilities and construction as indicated on Drawings as existing are not guaranteed. Before beginning Site Work, Contractor shall investigate and verify the existence and location of underground utilities and other construction.
    b. Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.
    c. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping.

END OF SECTION 01 31 13

SECTION 01 33 00 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedures for the submittal of Shop Drawings, Product Data, Samples, Operation and Maintenance Manuals, and other information.

B. Related Sections include pertinent Sections of these Specifications for the individual Submittals required.

1.3 DEFINITIONS

A. Submittal: Information sent by Contractor to convey information about systems, equipment, materials, products, and administrative matters for the Work.

B. Resubmittal: Submittal sent for review a second or further time.

C. Product Data: Illustrations, standard schedules, diagrams, performance charts, instructions, brochures, or manufacturer's literature that describe the physical size, appearance, and other characteristics of materials or equipment for a portion of the Work.

D. Shop Drawings: Drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

E. Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

F. Action Submittals: Submittals that require Engineer's response.

G. Informational Submittals: Submittals that do not require Engineer's response.

H. Delegated-Design: In certain individual Specification Sections, design services or certifications by a design professional that are specifically delegated to the Contractor. Performance and design criteria are defined in the individual Specification Sections or on the Drawings. Contractor is solely responsible for design of those items or systems, coordination of the design with the balance of the Project, and achieving specified performance.

I. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format. All PDF files shall be searchable.

1.4 SUBMITTAL PROCEDURES

A. Submittal Schedule:
   1. Prepare and submit a Submittal schedule that identifies the following for each Submittal:
      a. Submittal number
      b. Submittal description
      c. Projected date Submittal will be submitted.
   2. An electronic copy (MS Excel file) of a blank Submittal schedule, in the preferred format, will be furnished by Engineer at the preconstruction meeting.

3. Submittal Numbers:
    a. Use the applicable Specification Section number followed by a hyphen and then a sequential number (e.g., 06 10 00-1). Where a Submittal is required via a Drawing (instead of a Specification Section), use the applicable Drawing Number followed by a hyphen and then a sequential number (e.g., M501-1).
    b. Resubmittals shall include a letter suffix after another hyphen (e.g., 06 10 00-1-A).
    c. Submittals that are not numbered correctly may be rejected.

B. Delivery Method:
1. Web-Based Collaboration and Document Sharing System:
    a. A web-based collaboration and document sharing system may be utilized at Contractor's, Owner's, or Engineer's option.
    b. Use of such a system will be discussed during the preconstruction meeting.
    c. All parties must agree on use of a web-based collaboration and document sharing system.
    d. Training and licensing will be provided for all parties by the party suggesting use of a web-based collaboration and document sharing system.
2. Where a web-based collaboration and document sharing system is not utilized, Submittals may be delivered as paper copies or electronic files at Contractor's option; except for Operation and Maintenance Manuals, which shall be delivered as specified herein.
3. Advise Engineer and Owner of delivery method to be used at the preconstruction meeting.
4. Where Submittals include information that is intended to be printed on sheets larger than 11 inches x 17 inches, or where scale or drawing size are critical for proper review, submit 2 paper copies for review.
5. Electronic Files:
    a. Unless indicated otherwise, submit 1 copy of each Submittal in PDF format.
    b. Scanned Submittals shall be produced in such a way as to not compromise the graphic quality or accuracy of scale, where applicable; and text shall be searchable.
    c. One copy of each Action Submittal will be returned to Contractor.
    d. Transmit Submittals via electronic mail (e-mail) or web-based collaboration and document sharing system, where used. Submittals that are transmitted electronically will be returned electronically.
6. Transmit Submittals to party and address identified by Engineer at preconstruction meeting.

C. Coordination and Timing: Coordinate preparation and processing of Submittals with performance of construction activities. Contractor is responsible for cost of delays caused by lack of coordination or tardiness of Submittals. Incomplete Submittals will be rejected.
1. Coordinate each Submittal with fabrication, purchasing, testing, delivery, other Submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of Submittals for related parts of the Work so processing will not be delayed because of need to review Submittals concurrently for coordination.
    a. Engineer reserves the right to withhold action on a Submittal requiring coordination with other Submittals until related Submittals are received.

D. Processing Time: Allow 15 full working days for Engineer to review each Submittal, including Resubmittals. Time for review shall commence on Engineer's receipt of Submittal. No extension of the Contract Time will be authorized because of failure to transmit Submittals enough in advance of the Work to permit processing, including Resubmittals. Engineer will advise Contractor when a Submittal being processed must be delayed for coordination.

E. Identification: Place a permanent label on each Submittal or generate a separate cover sheet.
1. Indicate name of firm or entity that prepared Submittal.
2. Provide space to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information:
    a. Project name.
    b. Date.
    c. Name and address of Engineer.
    d. Name and address of Contractor.
    e. Name and address of Subcontractor(s).
    f. Name and address of Supplier(s).
    g. Name of Manufacturer.
    h. Submittal number, including revision identifier.
    i. Drawing number and detail references, as applicable.

j. Location(s) where product is to be installed, as applicable.
k. Other necessary identification.

F. Deviations: Encircle or otherwise specifically identify deviations from the Contract Documents on Submittals. Submittals that include deviations that are not identified may be rejected. Engineer may or may not consider deviations. Deviations are not substitutions. Provide a written request for consideration of any substitutions.

G. Transmittal: Package each Submittal individually and appropriately for transmittal and handling. Transmit each Submittal using a transmittal form. Engineer will reject Submittal(s) received from sources other than Contractor.

H. Resubmittals: Make Resubmittals in same form and number of copies as initial Submittal.
1. Note date and content of previous Submittal.
2. Clearly identify additions and revisions.
3. Resubmit Submittals until they are marked, “Reviewed, No Exceptions Noted” or “Reviewed With Corrections Noted.”

I. Distribution: Furnish copies of Submittals with mark indicating, “Reviewed, No Exceptions Noted” or “Reviewed With Corrections Noted,” to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities.

J. Use for Construction: Unless otherwise indicated by Engineer, use only Submittals with mark indicating, “Reviewed, No Exceptions Noted” or “Reviewed With Corrections Noted.”

1.5 CONTRACTOR'S USE OF ENGINEER’S ELECTRONIC DRAWING FILES

A. At Contractor's written request, copies of Engineer’s electronic Drawing files may be provided to Contractor for Contractor's use in connection with Project, including Submittal preparation. Electronic files may be furnished by Engineer for the convenience of the Contractor. Conclusions or information obtained or derived from such electronic files will be at the Contractor’s sole risk. Materials furnished by Engineer that may be relied upon are limited to printed Contract Documents.

B. When Contractor uses Engineer’s electronic Drawing files to facilitate Submittal preparation, prepare Submittals to be project specific. Submittals that are not project specific, including Engineer’s Drawing files submitted on a new title block, will be rejected.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit project specific Action Submittals required by individual Specification Sections. Do not use highlighting that would not be reproducible. Include a table of contents or index with each Submittal. As part of electronic submittals, the table of contents or index shall include electronic bookmarks to the first page of the respective Section(s) identified.

B. Product Data: Collect information into a single Submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for Submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each Submittal to indicate which products and options are applicable.
3. Include the following information, as applicable:
a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Color charts as required by individual Specification Sections.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.

i. Mill reports.
j. Standard product operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Maintain copy of returned Submittal for Project records.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale where appropriate. Scale shall be sufficiently large to indicate pertinent features of the item and its method of connection to the Work.
   1. Preparation: Fully illustrate requirements of the Contract Documents. Include the following information, as applicable:
      a. Dimensions.
      b. Identification of products.
      c. Fabrication and installation drawings.
      d. Colors and materials as applicable.
      e. Roughing-in and setting diagrams.
      f. Wiring diagrams showing field-installed wiring, including power, signal, control, and communication wiring. Differentiate between Manufacturer-installed and field-installed wiring.
      g. Manufacturing instructions.
      h. Templates and patterns.
      i. Schedules.
      j. Calculations.
      k. Compliance with specified standards.
      l. Notation of coordination requirements.
      m. Notation of dimensions established by field measurement.
      n. Relationship to adjoining construction clearly indicated.
   2. Sheet Size: Submit Shop Drawings on sheets at least 8-1/2 inches x 11 inches but no larger than 36 inches x 48 inches.
   3. Maintain copy of returned Submittal for Project records.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements, and for a comparison of these characteristics between Submittal and actual component as delivered and installed.
   1. Transmit Samples that contain multiple, related components, such as accessories, together in one Submittal package.
   2. Identification: On unexposed side of Samples, attach label that includes the following:
      a. Generic description of Sample.
      b. Product name and name of Manufacturer.
      c. Sample source.
      d. Number and title of appropriate Specification Section.
   3. Samples for Initial Selection: Submit Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available. Where Contract Documents indicate custom color or material, coordinate production of custom Samples with the Engineer and Manufacturer prior to submittal.
      a. Number of Samples: Unless indicated otherwise, submit 2 full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from Manufacturer's product line. Engineer will return 1 Sample with options selected.
   4. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, physically identical with material or product proposed for use, and that show full range of color and texture variations expected.
   5. Samples include, but are not limited to, the following: Partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

6. Number of Samples: Unless indicated otherwise, submit 2 sets of Samples. Engineer will retain 1 Sample set; remainder will be returned.
   a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
   b. If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
7. Disposition: Maintain sets of approved Samples at Site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used by Engineer to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples shall be in an undamaged condition at time of Substantial Completion.
   b. Samples not incorporated into the Work, or otherwise designated to become Owner's property, are the property of Contractor.

E. Operation and Maintenance Manuals:
   1. General:
      a. Where manuals are required to be submitted covering items included in the Work, prepare such manuals in durable plastic binders approximately 8-1/2 inches x 11 inches in size and with at least the following:
         1) Identification on, or readable through, the front cover stating general nature of the manual.
         2) Include a table of contents or index with each Submittal, near the front of the manual. As part of electronic submittals, the table of contents or index shall include electronic bookmarks to the first page of the respective Section(s) identified.
         3) Complete instructions regarding operation and maintenance of equipment involved, including:
            a) Equipment function, normal operating characteristics, and limiting conditions.
            b) Assembly, installation, alignment, adjustment, and checking instructions.
            c) Operating instructions for start-up, routine and normal operating, regulation and control, shutdown, and emergency conditions.
            d) Maintenance instructions, including lubrication requirements where applicable.
            e) Guide to "troubleshooting".
            f) Parts lists and predicted life of parts subject to wear.
            g) Project specific outline and cross sections, assembly drawings, engineering data, and wiring diagrams. Wiring diagrams shall reflect final, as-installed conditions and include wire numbers.
            h) Test data and performance curves.
         4) Complete nomenclature of all replaceable parts, their part numbers, current costs, and name and address of nearest vendor of parts.
         5) Copies of guarantees and warranties issued.
         6) Copies of the reviewed Submittals.
         7) Copies of data concerning changes made during construction.
   2. Extraneous Data: Where contents of the manuals include Manufacturer's catalog pages, clearly indicate the precise items included in this installation and delete all Manufacturers' data with which this installation is not concerned. Do not use highlighting that would not be reproducible.
   3. Number of Copies Required: Unless otherwise specifically directed by Engineer, or stipulated in the pertinent Section of these Specifications:
      a. For review, submit 1 electronic copy.
      b. For record, deliver 3 paper copies and 1 electronic copy to Owner.
   4. Schedule delivery of record copies of operation and maintenance manuals at least 60 days prior to startup of respective equipment, unless otherwise specified.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by individual Specification Sections. Do not use highlighting that would not be reproducible. Include a table of contents or index with each Submittal. As part of electronic submittals, the table of contents or index shall include electronic bookmarks to the first page of the respective Section(s) identified.

B. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects/engineers and owners, and other information specified.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on Manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by Manufacturer for this Project.

F. Manufacturer Certificates: Prepare written statements on Manufacturer's letterhead certifying that Manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on Manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on Manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

J. Product Test Reports: Prepare written reports indicating current product produced by Manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by Manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturers' names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

L. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

M. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

N. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

O. Manufacturer's Instructions: Prepare written or published information that documents Manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of Manufacturer. Include the following, as applicable:
   1. Preparation of substrates.
   2. Required substrate tolerances.
   3. Sequence of installation or erection.
   4. Required installation tolerances.
   5. Required adjustments.
   6. Recommendations for cleaning and protection.

P. Manufacturer's Field Reports: Prepare written information documenting tests and inspections of factory-authorized service representative. Include the following, as applicable:
   1. Name, address, and telephone number of factory-authorized service representative making report.
   2. Statement of substrate condition and acceptability of substrate for installation or application of product.
   3. Statement that products at Site comply with requirements.
   4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement whether conditions, products, and installation will affect warranty.
   7. Document settings in writing.
   8. Other required items indicated in individual Specification Sections.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each Submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Verify field dimensions and conditions; note corrections as necessary. Mark with approval stamp before submitting to Engineer.
   1. Approval Stamp: Stamp each Submittal with an approval stamp. Use the same stamp format for each Submittal. Include Project name and location, Submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that Submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

B. Submittals that are not approved and stamped by Contractor will be rejected.

3.2 ENGINEER’S REVIEW

A. Action Submittals: Engineer will review Action Submittals, make marks to indicate corrections or modifications required, and return Submittal. Engineer will stamp each Submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
   1. Reviewed, No Exceptions Noted: Submittal appears to conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
   2. Reviewed With Corrections Noted: Upon incorporation of review comments, it appears that Submittal will conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
   3. Revise and Resubmit: Submittal has one or more specific segments that are incomplete, do not appear to conform to the information given in the Contract Documents, or are incompatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Contractor shall resubmit information for review to demonstrate understanding of comments and portions of Work to be provided. Except as noted, Contractor shall not proceed with Work related to Submittal.
   4. Rejected, Resubmit: Submittal as a whole is incomplete, does not appear to conform to the information given in the Contract Documents, or is incompatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Contractor shall resubmit information for review to demonstrate understanding of comments and portions of Work to be provided. Contractor shall not proceed with Work related to Submittal.

B. Informational Submittals: Other Submittals required by the Contract Documents are for information only. Engineer will acknowledge receipt of Informational Submittals. Such Submittals include, but are not limited to:
   1. Qualifications Data.
   2. Certificates.
   3. Test Reports.
   4. Manufacturer's Instructions.
   5. Maintenance Data.
   6. Field Reports.

C. Delegated-Design Submittals: Review of Delegated-Design Submittals by Engineer shall not relieve Contractor of Contractor's sole responsibility for design and achieving specified performance.

D. Submittals not required by the Contract Documents will be returned without being reviewed.

E. Partial Submittals are not acceptable, will be considered non-responsive, and will be rejected.

END OF SECTION 01 33 00

SECTION 01 45 35 – TESTING SERVICES FOR BURIED UTILITIES, ROADWAYS, AND SITE PROJECTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes testing services as follows:
   1. Testing services which will be contracted and paid for directly by the Owner and performed by an independent testing agency selected by the Owner.
      a. Fill material from onsite and offsite.
      b. Fine and coarse aggregate certification tests.
      c. Bedding material certification tests.
      d. Bituminous pavement materials.
      e. Laboratory soil proctor tests.
      f. Soil compaction tests.
      g. Verification of soil bearing capacity.
      h. Base and subbase compaction tests.
      i. Pavement compaction tests.
      j. Collecting and transporting soil samples to the independent testing agency's laboratory.
      k. Laboratory soil proctor tests.
      l. Concrete slump and air entrainment tests.
      m. Concrete cylinder compressive strength tests.
      n. Travel expense of the independent testing agency.
      o. Making concrete cylinders.
      p. Transporting cylinders to testing agency's laboratory and performing tests.
   2. Testing services and certifications which will not be contracted and paid for directly by Owner and should be included in the Contractor’s base Bid:
      a. Pipe leakage and pressure tests.
      b. Pipe material tests.
      c. Testing performed for the Contractor's convenience.
   3. Owner Paid Items:
      a. The Owner may elect to inspect or test or to employ either the Engineer or an independent testing agency to test materials on the Project other than those specified herein.
      b. The cost of this testing will be paid for by the Owner.

B. Testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for verification of compliance with Contract Document requirements.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. AASHTO:
      a. Provisional Standard - TP 23 Standard Test Method for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying.
   2. ASTM Specifications, Tests and Test Methods:
      a. C31 - Making and Curing Concrete Test Specimens in the Field.
      b. C33 - Specification for Concrete Aggregates Including Appendix XI.
      c. C39 - Test for Compressive Strength of Cylindrical Concrete Specimens.
      d. C42 - Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
      e. C138 - Test for Unit Weight, Yield and Air Content of Concrete.
      f. C143 - Test for Slump of Portland Cement Concrete.
      g. C172 - Sampling Fresh Concrete.
      h. C173 - Test for Air Content of Freshly Mixed Concrete by the Volumetric Method.

i. C192 - Making and Curing Concrete Test Specimens in the Laboratory.
j. C227 - Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).
k. C231 - Test for Air Content of Freshly Mixed Concrete by the Pressure Method.
l. C289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
m. C295 - Standard Guide for Petrographic Examination of Aggregates for Concrete.
n. C567 - Unit Weight of Structural Lightweight Concrete.
o. C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
p. D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort.
q. D1188 - Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Paraffin-Coated Specimens.
r. D1556 - Density of Soil In Place by the Sand-Cone Method.
s. D1557 - Moisture-Density Relations of Soils and Soils Aggregate Mixture Using 10 Pound Rammer and 18-Inch Drop.
t. D1586 - Penetration Test and Split Barrel Sampling of Soils.
u. D1883 - CBR (California Bearing Ratio) of Laboratory Compacted Soils.
v. D2166 - Unconfined Compressive Strength of Cohesive Soil.
w. D2167 - Density of Unit Weight of Soil In Place by the Rubber Balloon Method.
x. D2922 - Density of Soil and Soil Aggregates by Nuclear Methods.
y. D2937 - Density of Soil in Place by Drive Cylinder Method.
z. D2950 - Test Methods for Density of Bituminous Concrete in Place by Nuclear Methods.
aa. D3666 - Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials.
bb. D3740 - Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as used in Engineering Design and Construction.

3. ACI - American Concrete Institute:
   a. 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
   b. 211.1R - Report on Alkali-Aggregate Reactivity.
   c. 301 - Specification for Structural Concrete for Buildings.
   d. 318 - Building Code Requirements for Reinforced Concrete.
4. MDOT Standards: Michigan Cone Test for Determination of Maximum Unit Weight of Granular Soils.

1.4 TEST REQUIREMENTS

A. In accordance with:
   1. Laws and Regulations.
   2. Sections of these Specifications.
   3. Reference procedures and requirements.
   4. Pertinent standards for testing.

B. Testing Agency Qualifications:
   1. Approved by authorities having jurisdiction.
   2. Agency meeting the requirements of ASTM C1077, D3666, and D3740.
   3. Agency whose primary business is materials and construction testing.
   4. Approved by the Engineer or the Owner.
   5. Objective, competent and independent from the Contractor performing the work to be inspected.
   6. Having adequate equipment, periodically calibrated as required, to perform the special inspections.
   7. Employing experienced personnel educated in conducting, supervising and evaluating special inspections similar in complexity to that required for the Project.

1.5 RETESTING COSTS

A. Retesting:
   1. When initial special inspections of items except soil compaction indicate noncompliance with the Contract Documents, subsequent special inspections occasioned by the noncompliance shall be performed by the same special inspection agency, and the costs thereof will not be reimbursed.

2. Soil Compaction:
   a. The first retesting of soil compaction shall be paid for in accordance with the provisions of the Contract Documents.
   b. The second and subsequent retesting for soil compaction due to noncompliance with the Contract Documents shall be performed by the same special inspection agency, and the costs thereof will not be reimbursed.

1.6 REPORTS

A. Provide the Engineer's field representative and Contractor's superintendent with a draft copy of the daily report prior to leaving the Project Site each day on which testing is performed on the Site.

B. Provide typed copies of testing agency reports, inspections, and certifications within 5 business days to:
   1. The Engineer's Office: One copy.
   2. The Contractor's Office: One copy.

1.7 SCHEDULING TESTING

A. Coordinate and schedule the work of the independent testing agency.
   1. Notify the Engineer and the independent testing agency 48 hours prior to the expected time when testing services will be required.
   2. Provide access to the Work as necessary for the agency to properly perform its functions.

B. Establishing Schedule: By advance discussion with the Engineer and independent testing agency, determine the time required to perform tests and to issue findings.

C. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the independent testing agency as required.

D. Adherence to Schedule: When the independent testing agency is ready to test according to the determined schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra costs for testing attributable to the delay will be paid by the Contractor.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 TESTING REQUIREMENTS

A. Fine and Coarse Aggregate and Bedding Material:
   1. Sieve test to ensure compliance with the materials specifications.
   2. Provide 1 test for each source of imported materials as directed by the Engineer.

B. Fill Material from Onsite and Offsite Sources: Sieve test to ensure compliance with the materials specifications.

C. Soil Compaction:
   1. Minimum Frequency of Testing:
      a. Within the Building Footprint: Not applicable.
      b. Outside a Building Footprint: One test per 5,000 square feet of subgrade for each layer of fill.
      c. Utility Trenches: One test for every 200 linear feet of trench length at each lift.
      d. Utility Structures: One test under each manhole, vault or other structure.
      e. Curb and Gutter: One test for every 100 linear feet.
      f. Pavement Subgrade, Base Grade:
         1) One test for every 2,500 square feet for road construction.
         2) One test at every driveway or curb cut location.
         3) One test for every 500 square feet for road intersections.

2. Predominately Granular Soils:
   a. Perform necessary laboratory and field testing required to verify compaction of fill, bedding, trench backfill and structure backfill in accordance with ASTM D1557 or Michigan Cone.
   b. Verify the compaction of the first 12 inches of the existing subgrade below structures, utility structures, paved areas, and areas to be filled in accordance with ASTM D1557 or Michigan Cone.
3. Predominately Cohesive Soils:
   a. Perform necessary laboratory and field testing required to verify compaction of fill trench backfill and structure backfill in accordance with ASTM D698.
   b. Verify the compaction of the first 12 inches of the existing subgrade below structures, utility structures, paved areas, and areas to be filled in accordance with ASTM D698.
4. Independent testing agency shall inform the Engineer and the Contractor's onsite supervisor immediately of onsite test results.
5. Place no additional fill in areas where compaction results do not meet Specification requirements.

D. Testing Bituminous Paving:
   1. The testing agency shall provide quality control and testing services that will be monitored by the Engineer's field representatives continuously during paving.
   2. The testing agency shall take 1 mixture sample per day and 1 test per 1,000 tons of material placed.
      a. This sample shall be taken randomly from the back of the hauling unit.
      b. This sample shall be large enough to provide the Contractor, testing agency, and Engineer with an equal split of the sample.
      c. The testing agency shall test the samples for the following:
         1) 50 blow Marshall bulk specific gravity or a 50 gyration gyratory compactor bulk specific gravity (G_{mb}).
         2) Theoretical Maximum Density (TMD) (AASHTO T209) or maximum specific gravity of paving mixture (no air voids) (G_{mm}).
         3) % Asphalt binder.
         4) Aggregate gradation and % crushed aggregate.
      d. With the above information and the mix design aggregate effective specific gravity, calculate the following:
         1) Mixture air voids.
         2) Mixture voids in the mineral aggregate (VMA) using bulk specific gravity of aggregate (Gsb).
         3) % Asphalt binder.
   3. The results of these tests shall be compared to the approved mix design and must be within the tolerances indicated below or all additional truck loads of non-compliant material shall be removed from the Site.
      a. The material supplier shall then make recommendations to the Engineer of how the mixture will be revised to meet the Specifications.
      b. The results of these tests and the split samples must be presented to the Engineer before mixture production begins the following day.
      c. If the Engineer wishes to test the split samples, they may use the supplier's laboratory and equipment.
      d. The Engineer reserves the right to work with the supplier and modify the supplier's mix design to ensure the product meets the Drawings and Specification requirements.
      e. This may include increasing asphalt content and adjusting aggregate gradations within the bituminous mixture composition specification.

Testing/Verification Tolerances			
Parameter	Single test	Average of 2 or more tests	Comments
Air Voids	±1.00%	-1.0%+0.5%	
VMA	±1.20%	±1.20%	
TMD (G_{mm})	±0.019	±0.015	
Asphalt Binder	±0.4%	±0.3%	>0.4% less than JMF may be subject to reduced payment
%Fines/% Asphalt	Max 1.6	Max 1.6	Result must be less than 1.6
#4 sieve	±5.0%	±3.0%	
#30 sieve	±4.0%	±3.0%	
#200 sieve	2.0%	±1.0%	
Crushed Particles	±10%	±10%	>10% less than JMF may be subject to reduced payment

4. The Contractor shall have the testing agency's density technician and a density gage available whenever paving is occurring. This technician and gage shall monitor placement and compaction of asphalt to verify the maximum density possible is being achieved.
5. The testing agency shall take 1 core on each 25,000 square feet of new parking lot.
    a. The percent compaction of these cores shall be calculated using the TMD of the approved mix design (JMF) unless otherwise directed and the results used for determining compliance with this Specification.
    b. The daily average in place density:
        1) Low/medium Volume Roads: 95.0% of the mixture's TMD or greater with a minimum density of 94% of TMD.
        2) Heavy Volume Roads: 94% of the mixtures TMD or greater with a minimum density of 93% TMD.
    c. Areas that are not compacted to the specified daily average will be evaluated by the Engineer and may either be removed or subject to a price reduction.
6. Thickness: In place compacted thickness tested in accordance with ASTM D3549.
7. Surface Smoothness:
    a. Test finished surface of each hot mix asphalt course for smoothness, using 10 foot straightedge applied parallel with and at right angles to centerline of paved area, or by measuring depths of bird baths immediately after a rain.
8. Workmanship:
    a. Finished Surfaces, Especially in High Visibility Areas: Smooth, free of cracks, raveling or spalling holes, rake or roller marks and depressions, or bird baths.
    b. Problem Areas Identified: Correct by removing, paving or reheating and re-rolling if possible.
9. Test Reports:
    a. Summarize the results of the bituminous paving using the "Report of Verification/Acceptance Testing & Core Density."
    b. Electronically submit this document to the Project team on a daily basis prior to the placement of any subsequent pavement.
10. Porous Bituminous Asphalt.
    a. Mix Verification (ASTM D2172): One test per 1,000 ton placed or fraction thereof.
    b. Weight Slips:
        1) Furnish weight slips for material incorporated in the Project.
        2) Verify that the required tonnage has been applied by calculating and submitting yield for each day of work.
    c. Compaction and Thickness Testing:
        1) Nuclear Gage (ASTM D2950): Minimum 5 per day or 1 test per 7,500 square feet.
        2) Pavement Cores: Minimum 2 per day or 1 test per 20,000 square feet or as directed.
    d. Field Infiltration Test:
        1) In accordance with ASTM C1701.
        2) One test per 25,000 square feet.
        3) Witnessed by Engineer.
    e. Surface Smoothness: Test using a 10 foot straightedge applied parallel to and at right angles with the centerline.

E. Concrete Testing:
1. Point of sampling and the method of securing the Samples:
    a. Determined by the independent testing agency.
    b. In accordance with ASTM C172.
2. Slump Tests:
    a. Perform slump tests in accordance with ASTM C143.
    b. Perform 1 slump test on the Site for each truckload of concrete.
    c. At the Engineer's request, also perform slump tests at batch plant before adding water reducer.
    d. Perform more slump tests if deemed necessary by the Engineer.
3. Perform 1 air-entraining test in accordance with ASTM C231 or C173 for each truckload of concrete.
4. Test the concrete unit weight in accordance with ASTM C138 or C567, as applicable.
5. Test the air content and fresh concrete temperature of each set of concrete cylinders.

6. Concrete Cylinder Testing:
   a. In accordance with ASTM C31 and C39.
   b. Take concrete cylinder Sample set as follows:
      1) Once for each 150 cubic yards (or fraction thereof) of each class of concrete placed each day, nor less than.
      2) Once for each 2,500 square feet of sidewalk or paving surface area placed each day.
   c. Concrete Cylinder Sample Set: Consist of 4 standard 6-inch cylinders.
   d. Handle cylinders carefully.
   e. Onsite Storage:
      1) Handle cylinders carefully.
      2) 12 hours, minimum, 48 hours maximum.
      3) Store at a temperature range of 60 to 80 degrees F and in a moist environment.
      4) Shield from direct sunlight and radiant heat.
      5) Construct heated or water bath enclosures, as applicable, if conditions require.
      6) Cylinder samples taken to establish adequate strength for form removal earlier than 28 days shall be cured in locations that represent the conditions under which the structural concrete will be cured.
   f. Laboratory Curing: For duration of curing after onsite storage.
   g. Test 1 of the cylinders at 7 days and 2 cylinders at 28 days. Save 1 cylinder as a spare.
   h. Acceptance and evaluation of the concrete shall be based on ACI 301.
7. Porous Concrete:
   a. Testing Frequency: Each 150 yd^3 or fraction thereof; minimum 1 set of tests for each day placement.
   b. Field Testing:
      1) Sampling: Plastic concrete in accordance with ASTM C172.
      2) Density:
         a) ASTM C1688/C1688M.
         b) Acceptance - within 5 lb/ft^3 of approved design density (unit weight).
      3) Void Content:
         a) Plastic concrete in accordance with ASTM C1688/C1688M.
         b) Acceptance: Not more than 2% below the specified minimum.
   c. Concrete Cores:
      1) Construct a test panel for each day of production.
         a) Use same materials and procedures as production paving.
         b) Minimum size 5 foot x 5 foot.
      2) Up to 3 cores for each day's production or each 150 yd^3 or fraction thereof or as directed.
      3) In accordance with ASTM C42.
      4) After minimum of 7 days analyze 1 core from the set.
         a) Thickness:
            (1) ASTM C174.
            (2) Acceptance: Untrimmed samples not less than 1/2 inch specified thickness.
         b) Void Content:
            (1) ASTM C642.
            (2) A New Test Method for Porosity Measurements of Portland Cement Pervious Concrete *Felipe Montes,*1 *Srinivas Valavala,*1 *and Liv M. Haselbach*2; *Journal of ASTM International*, January 2005, Vol. 2, No. 1.
            (3) Acceptance: within specified range.
      5) Density: ASTM C642.

END OF SECTION 01 45 35

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of construction facilities as follows:
   1. Temporary Utilities: Water, electricity, and internet.
   2. Contractor's field offices.
   3. Sanitary facilities.
   4. Temporary heat.
   5. Temporary protective fence.
   6. Project signs.
   7. Enclosures such as tarpaulins, barricades and canopies.
   8. Storage areas.

1.3 SUBMITTALS

A. Samples: For construction project identification sign.
   1. Required Sample:
      a. 11 x 17 color proofs of sign representing actual appearance of sign producer’s final product.
      b. Created by sign producer.
   2. Submit and obtain review by Engineer prior to printing final version of vinyl.

1.4 QUALITY ASSURANCE

A. Construction Project Identification Sign Producer Qualifications:
   1. Having a minimum of 3 years’ experience in production of signs of specified type.

1.5 STORAGE AREAS

A. Locations:
   1. The following general areas are available for storage:
      a. Lagoon site.
      b. WTP parking lot and areas around reservoir as approved by the Owner.
   2. Specific storage locations within the general areas:
      a. Carefully coordinate with Owner.
      b. Subject to approval of Owner.

B. Protection and Restoration:
   1. Protect the sites by providing temporary protective fencing while existing security fence is removed.
   2. Protect trees and shrubs in the storage areas.
   3. Replace grass and other vegetation disturbed or damaged in the storage areas.
   4. Take reasonable means to prevent spillage of fuel, oil, chemicals and similar materials.
   5. Clean up spills and, if necessary, remove soil and replace with uncontaminated soil so as to allow vegetation to be quickly reestablished.
   6. Provide secondary containment for storage of hazardous materials, as required by governing authorities or agencies.

C. Cleaning: Keep storage areas clean in accordance with Division 01 Section “Cleaning and Waste Management.”

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
1. New or used.
2. Adequate in capacity for the required usage.
3. Provide safe conditions.
4. Comply with requirements of applicable codes and standards.

2.2 UTILITIES

A. Temporary Utilities:
1. Equipment Testing:
a. Pay utility charges for all power, water and other utilities.
b. Furnish, install, remove and pay for associated temporary equipment, piping, pumps, fuel, power distribution, and connections.
2. Water:
a. Owner will pay for water usage charges.
b. Furnish, install, remove and pay for all temporary piping, water meters, equipment and connections.
c. Obtain water by connection to Owner's existing water system.

2.3 FIELD OFFICES

A. Contractor's Field Office:
1. Contractor's field office shall have at least 1 outside door.
2. Pay for all heat, electricity and internet charges.

2.4 SANITARY FACILITIES

A. Furnish and install required sanitary facilities, including temporary toilet buildings with sanitary toilets and hand washing facilities or hand sanitizing stations, for use of workers; comply with minimum requirements of the Health Department or other public agency having jurisdiction; maintain in a sanitary condition at all times.

2.5 PROJECT IDENTIFICATION SIGN

A. Sign Production:
1. By vinyl transfer material process.
2. Vinyl Material:
a. Heavy duty front lit vinyl.
b. Cool Flex E-Stat I, by 3M; or equal.
3. Drymount vinyl to 3-foot x 5-foot x 3/4-inch exterior grade plywood with medium density overlay on front and back faces.
4. Quantity: 3.

B. Sign Graphic Content:
1. Provided to Contractor by Engineer at no cost.
2. Consisting of:
a. Computer file on hard drive.
b. Small scale color copy of intended appearance.

C. Framing Structure:
1. New or used.
2. Wood or metal.
3. In sound condition structurally adequate to support specified sign.
4. Suitable for specified finish.
5. Rough Hardware: Galvanized.
6. Paint: Exterior quality.

D. Erect in a location:
   1. Onsite and highly visible.
   2. To be determined in field.
   3. As approved by Engineer.

2.6 OTHER TEMPORARY CONSTRUCTION FACILITIES

A. Furnish, install and maintain all other temporary construction facilities necessary for proper completion of the Work.

PART 3 - EXECUTION

3.1 GENERAL

A. Comply with applicable requirements specified in:
   1. Local Building Code.

B. Maintain and operate systems to ensure continuous service.

C. Modify and extend systems as Work progress requires.

3.2 TEMPORARY CONTROLS

A. Traffic Control:
   1. Provide adequate warning lights, signs, barricades and flagmen; take all necessary precautions for the protection of the Work, and the safety of the general public.
   2. Lights, signs and barricades shall conform to the Michigan Manual of Uniform Traffic Control Devices.
   3. All lights, signs, barricades and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and, where within highway rights-of-way, as required by the authority having jurisdiction thereover.

B. Detours:
   1. Shall be approved by Owner and highway authority having jurisdiction prior to closing any road.
   2. Contractor shall secure above approvals and comply with all conditions thereof at Contractor's expense.

3.3 REMOVAL

A. Maintain all temporary facilities and controls as long as needed for the safe and proper completion of the Work. Remove all such temporary facilities and controls as rapidly as progress of the Work will permit.

END OF SECTION 01 50 00

SECTION 01 74 00 – CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes provisions for maintaining structures and the Site in a standard of cleanliness.

B. Related Sections: In addition to standards described in this Section, comply with requirements for cleaning as described in various other Sections of these Specifications.

1.3 QUALITY ASSURANCE

A. Inspection:
   1. Daily and more often if necessary.
   2. Conduct inspections to verify that requirements of cleanliness are being met.

1.4 DELIVERY, STORAGE AND HANDLING

A. Hazards Control:
   1. Volatile Wastes:
      a. Store in covered metal containers.
      b. Remove from premises daily.
      c. Provide secondary containment for storage of hazardous materials, as required by governing authorities or agencies.
   2. Prevent accumulation of wastes which create hazardous conditions.
   3. Provide adequate ventilation during use of volatile or noxious substances.

1.5 PROJECT CONDITIONS

A. Cleaning and Disposal:
   1. Conduct operations to comply with local ordinances and anti-pollution laws.
   2. Not Allowed:
      a. Burning or burying of rubbish or waste materials on Site.
      b. Disposal of volatile wastes in storm or sanitary sewers: Volatile wastes include, but are not limited to, mineral spirits, oil or paint thinner.
      c. Disposal of wastes into streams or waterways.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Compatibility:
   1. Compatible with the surface being cleaned.
   2. Recommended by the Manufacturer of the material being cleaned.
   3. As reviewed by Engineer.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General:
   1. Store Materials:
      a. In an orderly arrangement allowing maximum access.
      b. To allow unimpeded drainage and traffic.
      c. Provide for the required protection of materials.
   2. Do not allow accumulation of scrap, debris, waste material and other items not required for construction of the Work.
      a. Remove from Site at least each week and more often if necessary.
      b. Provide adequate storage for materials awaiting removal.
   3. Observe requirements for fire protection and protection of the environment.

B. Site:
   1. Daily, and more often if necessary:
      a. Inspect the Site.
      b. Pick up scrap, debris and waste material; remove such items to the place designated for their storage.
   2. Weekly, and more often if necessary:
      a. Inspect arrangements of materials stored on Site.
      b. Restack or otherwise service arrangements to meet the requirements of paragraph 3.1.A.1 above.
   3. After flushing and pigging the existing force main after construction is completed, cleaning of lime residuals from surfaces adjacent to the lagoon.
   4. At all times maintain the Site in a neat and orderly condition which meets the approval of Engineer.
   5. Paved Surfaces: Keep clean.
   6. Dust Control:
      a. Control dust on or near the Work by the application of water or other approved means.
      b. If Contractor fails to correct unsatisfactory conditions with 24 hours after due notification:
         1) Owner may arrange for such work to be performed by other means.
         2) Pay costs.

3.2 FINAL CLEANING

A. Definitions for Clean: The level of cleanliness generally provided by commercial building maintenance subcontractors using commercial quality building maintenance equipment and materials.

B. Prior to Completion of the Work:
   1. Remove from the Site all tools, surplus materials, equipment, scrap, debris and waste.
   2. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:
   1. Unless otherwise specifically directed by Engineer:
      a. Hose down paved areas on Site and public sidewalks directly adjacent to the Site.
      b. Rake clean other surfaces of the grounds.
   2. Remove resultant debris.

D. Timing: Schedule final cleaning as approved by Engineer to enable Owner to accept a completely clean Project.

END OF SECTION 01 74 00

SECTION 01 77 00 – CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the instructions for and the responsibilities of each party in contract closeout.

B. Related Section includes Certificate of Substantial Completion.

1.3 SUBSTANTIAL COMPLETION

A. Contractor: When Contractor considers that the Work or any portion of the Work is ready for its intended use, Contractor shall submit:
   1. Written certification to Engineer and Owner that the Work, or designated portion of the Work, is substantially complete.
   2. A list of major items to be completed or corrected.
   3. Request that Engineer issue a certificate of Substantial Completion.

B. Engineer's Inspection: Engineer will make an inspection:
   1. Within 10 days after receipt of certification.
   2. Together with Owner and Contractor.

C. Engineer's Determination of Substantial Completion:
   1. Should Engineer consider the Work or designated portion of the Work substantially complete, the following steps shall be taken:
      a. Contractor shall prepare and submit to Engineer, a list of items to be completed or corrected as determined by the inspection.
      b. Engineer will prepare and deliver to Owner:
         1) A tentative certificate of Substantial Completion.
         2) A tentative list of items to be completed or corrected before final payment.
      c. Owner shall have 7 days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list.
      d. Engineer will, within 14 days after delivery of tentative certificate to Owner, decide:
         1) Not Substantially Complete: Engineer will issue written notice to Contractor stating reasons.
         2) Substantially Complete: Engineer will issue definitive certificate of Substantial Completion and a revised list of items to be corrected or completed.
   2. Should Engineer consider that the Work or designated portion of the Work is not substantially complete, the following steps shall be taken:
      a. Engineer shall notify Contractor in writing stating Engineer's reasons.
      b. Contractor shall complete the Work and send a second written notice to Engineer certifying that the Project, or designated portion of the Project, is substantially complete.
      c. Engineer and Owner will reinspect the Work.

D. Division of Responsibilities:
   1. Engineer:
      a. At the time of delivery of tentative certificate of Substantial Completion.
      b. Deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment with respect to:
         1) Security.
         2) Operation.
         3) Safety.

4) Protection of the Work.
5) Maintenance.
6) Insurance.
7) Warranties.

2. Engineer's written recommendation on division of responsibilities shall be binding on Owner and Contractor until final payment unless Owner and Contractor agree otherwise in writing and so notify Engineer prior to Engineer's issuance of a definitive certificate of Substantial Completion.

1.4 FINAL INSPECTION

A. Contractor Certification: Prior to final inspection, Contractor shall submit written certification that:
1. The Contract Documents have been reviewed.
2. The Project has been inspected in compliance with the Contract Documents.
3. Work has been completed in accordance with the Contract Documents.
4. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
5. The Project is complete and ready for final inspection.

B. Engineer's Inspection: The Engineer will make final inspection:
1. Within 10 days after receipt of certification.
2. Together with Owner and Contractor.

C. Engineer's Determination of Final Completion:
1. Should Engineer consider the Work complete and ready for final payment in accordance with the requirements of the Contract Documents, Engineer shall request Contractor to make Project closeout submittals.
2. Should Engineer consider the Work not complete and ready for final payment:
a. Engineer shall notify Contractor in writing stating the reasons.
b. Contractor:
1) Take immediate steps to remedy the stated deficiencies.
2) Send a second written notice to Engineer certifying that the Work is complete.
c. Engineer and Owner will reinspect the Work.

1.5 CLOSEOUT SUBMITTALS

A. Contractor:
1. Provide closeout submittals as required in the Contract Documents.
2. These submittals shall include, but not necessarily be limited to:
a. Project record documents.
b. Operation and maintenance manuals.
c. Guarantees.
d. Spare parts and maintenance materials.
e. Instruction in operation of all systems.

1.6 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Affidavits:
1. Submit with final Application for Payment an affidavit of payment of debts and release of claims.
2. Affidavit shall include:
a. Contractor's release or waiver of lien.
b. Consent of surety of final payment.

B. Execution: All submittals shall be duly executed before delivery to Engineer.

1.7 FINAL ADJUSTMENT OF ACCOUNTS

A. Final Statement: Submit a final statement of accounting, which reflects all adjustments, to Engineer. This statement shall contain the following:
   1. Original Contract Price.
   2. Additions and deductions.
   3. Total Contract Price as adjusted.
   4. Previous payments.
   5. Sum remaining due.

B. Final Change Order: Engineer will prepare a final Change Order reflecting approved adjustments to the Contract Price not previously made by Change Orders.

1.8 FINAL APPLICATION FOR PAYMENT

A. Contractor shall submit a final Application for Payment in accordance with the requirements of the Contract Documents.

B. Disposition of Final Application for Payment:
   1. If the final Application for Payment and the Work are acceptable in accordance with the Contract Documents:
      a. Engineer will, within 10 days after receipt of the Application for Payment:
         1) Submit to Owner a written recommendation for payment.
         2) Submit to Owner and Contractor a written notice that the Work is acceptable subject to the provisions of the General Conditions.
      b. Owner will, within 30 days after receipt of the Application for Payment and Engineer's recommendation in accordance with the Contract Documents, pay to Contractor the amount recommended.
   2. If the Application for Payment, the Work or both are unacceptable:
      a. Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment.
      b. Contractor shall make the necessary corrections and resubmit the Application for Payment.
   3. Final Completion Delayed:
      a. Upon receipt of Contractor’s final Application for Payment and recommendation by Engineer, Owner shall make payment of the balance due for that portion of the Work fully completed and accepted if Engineer confirms that final completion of the Work is significantly delayed through no fault of Contractor.
      b. Payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.
      c. Contractor shall submit with the Application for Payment written consent of surety if the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 77 00

SECTION 01 78 39 – PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes procedures for the maintenance, recording and submittal of Project record documents.

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Storage:
   1. Store documents and Samples in Contractor's field office apart from documents used for construction.
   2. Provide files and racks for storage of documents.
   3. Provide locked cabinet or secure storage space for storage of Samples.

B. Filing: File record documents in accordance with CSI Masterformat.

C. Maintenance:
   1. Maintain documents in a clean, dry, legible condition and in good order.
   2. Do not use record documents for construction purposes.

D. Availability: Make documents and Samples available at all times for inspection by Engineer.

1.4 RECORDING

A. Labeling: Label each document "PROJECT RECORD" in neat large printed letters.

B. Recording:
   1. Record actual revisions to the Work.
   2. Record information concurrently with construction progress.
   3. Do not conceal any work until required information is recorded.

C. Drawings:
   1. Legibly mark, with notes or graphic representations, to record actual construction.
      a. Horizontal and vertical locations of Underground Facilities and appurtenances, referenced to permanent surface improvements.
      b. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
      c. Field changes of dimension and detail.
      d. Changes made by Field Order, Work Change Directive or Change Order.
      e. Details not on original Contract Drawings.
   2. After Engineer's review of the record drawings, transfer all marks to a set of hard copy and electronic documents provided by Engineer.

1.5 SUBMITTAL

A. Delivery:
   1. At Contract closeout, deliver record documents to Engineer for Owner.
   2. Submit only Contract Documents marked up. Three dimensional models, shop drawings, or other representations of the Project created by the Contractor from the Contract Documents will not be accepted.

B. Transmittal Letter:
   1. Accompany submittal with transmittal letter in duplicate, containing:
      a. Date.
      b. Project title and number.
      c. Contractor's name and address.
      d. Title and number of each Record Document.
      e. Signature of Contractor or their authorized representative.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 78 39

SECTION 02 22 26 – PRECONSTRUCTION AUDIO-VISUAL DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing of all labor, materials and equipment necessary for a complete color audio-video record of the existing surface features for the entire project to accurately document the pre-construction conditions within the proposed construction's zone of influence.

1.3 SUBMITTALS

A. Qualifications: Submit such information as requested by the Engineer to determine the ability to produce professional video in accordance with industry standards and these specifications.

1.4 QUALITY ASSURANCE

A. Audio-video documentation shall be by a responsible commercial firm regularly engaged in color audio-video construction documentation.

B. Owner reserves the right to reject any audio-video documentation not conforming to these Specifications. Such rejected documentation shall be redone at no additional cost to Owner.

1.5 PRODUCT DELIVERY

A. Deliver to Owner through Engineer premium quality portable hard drives or flash drives with recorded documentation upon completion of the project or upon completion of segments, if requested.

1.6 SEQUENCING AND SCHEDULING

A. Attend a meeting with Engineer to outline the coverage expected for the project, prior to the start of the video documentation.

PART 2 - PRODUCTS

2.1 Delivered product shall include all digital audio-video files, storage cases, file index labels, and runsheet logs.

A. Video to be mastered on high quality formats only:
   1. Flash drive.
   2. Portable hard drive.

B. High quality cameras to be used:
   1. With 1/4-inch, 1/3-inch or 1/2-inch charged coupled device imaging systems.
   2. With optical stabilization; electronic stabilization is not acceptable.
   3. With 20x minimum optical magnification.
   4. Capable of producing NTSC 525 lines of resolution/60 fields/30 frames per second.
   5. Capable of 3-luxillumination minimum.

C. File Index Labels:
   1. All files shall be labeled with appropriate project information and be able to be cross referenced with runsheets.
   2. Label information to include:
      a. File number.
      b. Project title.
      c. Location of project.

d. Month and year of coverage.
e. Set information, i.e., Engineer's set, Owner's set, Contractor's set.
f. Quick reference list of contents of a particular file.

D. Runsheet Logs:
1. Provide a runsheet log that accurately catalogs the contents of each video.
2. Runsheet logs to include:
a. Street name, easement or address.
b. Sheet number or numbers relative to the line entry of a particular area of coverage.
c. File numbers.
d. Real time code indexing for each segment of the project indicating hours minutes and seconds to cross reference with playback equipment to locate specific points of interest on the project.
e. Direction of travel for each specific segment.
f. Viewing side for each specific segment.
g. Starting point for each specific segment.
h. Ending point for each specific segment.
i. Project information, i.e. project title, owner, date.

E. Vehicles used while performing documentation to be plainly marked with company name and telephone number with caution signs, flags and strobes to affect a safe and hazard free operation.

PART 3 - EXECUTION

3.1 RECORDING

A. General:
1. Coverage:
a. Recordings shall include coverage of all surface features located within the zone of influence of the proposed construction.
b. The zone of influence is defined as the area within the road right-of-way, area within permanent and temporary easements and adjacent areas which may be affected by routine construction operations.
c. The surface features include, but are not limited to, all roadways, pavements, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery, and fences.
d. Of particular concern shall be the existence or nonexistence of any faults, fractures, or defects.
e. All recording shall be performed during times of good visibility.
f. No recording shall take place when there is snow cover on the ground unless authorized by Engineer.
g. The Engineer may designate areas to be omitted or added for audio-video documentation.
h. Areas not accessible by conventional wheeled vehicles shall be accessed by walking or special conveyance.
2. Time of Execution: Prior to placement of equipment and materials on the jobsite.
3. Coverage Continuity:
a. Accessible Areas: Coverage shall consist of a single, continuous, recording which begins at one end of a particular construction area and continues to the other end of that construction area.
b. Non Accessible Areas (Across Easements, Etc.): Coverage shall consist of an organized, interrelated sequence of recordings at various positions along the proposed construction area.
4. Video portion of the documentation shall reproduce bright, sharp, clear pictures with accurate colors and shall be free from distortion, tearing, rolls or any other form of picture imperfection.
5. Audio Portion of the Documentation:
a. Shall reproduce the commentary of the camera operator with proper volume, clarity, free from distortion and background noise.
b. Assist in maintenance of viewer orientation and in identification, clarification, or objective description of the structures being shown in the video portion of the recording.
6. Video shall display through electronic means information germane to the current video display.
a. Display continuously information as follows:
1) Time and date of recording.
2) Location of recording, i.e., street name, easement or address.

b. When conventional wheeled vehicles are utilized, include engineering stationing to coincide with project plans, direction of travel and viewing side.
   1) The engineering stationing must be continuous and accurate and reflect the stationing within the field of view.
   2) The engineering stationing must coincide with stationing on project plans and utilize standard engineering symbols, i.e., 5+00.
   3) Global Positioning System satellites may be used with or in place of engineering stationing.
      a) Differential Global Positioning System is to be used where available, with updates 1/second at 5 meter or less spherical accuracy.
      b) Standard Global Positioning System accuracy is as dictated by the United States Department of Defense mandate.
      c) Global Positioning System display will be at 1 meter longitude and 1 meter latitude increments, i.e., 414N529 08317W302.

B. Procedural Requirements for Coverage Rates:
   1. The following table sets the maximum rate of travel for the following areas:

AREA	AVE RATE MAX
WTP parking lot, Sunset Road adjacent to WTP parking lot, lagoon site, Trucking route from lagoon to Miller Avenue and any areas subject to Contractor's work activities	30 ft/min

   2. Camera Positioning and Techniques:
      a. Height and Stability: Camera to be mounted securely to produce steady viewing with lens not less than 8 feet above the ground of the area being viewed, or at a level to facilitate best perspective and line of site when using conventional wheeled vehicles.
      b. Control: All movements shall be at a rate that allows recorded objects to be viewed clearly during video playback.
      c. Viewer Orientation for Road Areas: Utilize overall establishing views and visual displays of all visible house and building addresses.
         1) Easement Areas: Highly visible yellow flags shall be used to clearly define proposed centerline of construction.
   3. Private Property:
      a. Contractor shall obtain permission of property owner before entering private property.
      b. If Contractor is refused entry to private property, Contractor shall notify Engineer and wait until permission is obtained before entering the property.

END OF SECTION 02 22 26

SECTION 02 41 19 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the modification, alteration, conversion, and renovation of existing structures:
   1. Be aware of the many incidental items which exist which must be demolished, relocated, or replaced in order to accomplish the remodeling work of trades.
   2. Include the price of such demolition, relocating, and replacement in the base Bid.
   3. These incidental items may or may not be indicated in the Contract Documents.
   4. Contractor and Subcontractors performing remodeling work are expected to be familiar with the unknown nature of existing utilities serving an area to be remodeled and shall calculate the base Bid to include the demolition, removal, relocation, and replacement of these utilities.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the pertinent provisions of the following:
   1. American National Standards Institute: ANSI A10.6 - Safety Requirements for Demolition Operations.
   2. ASTM: D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
   3. EPA: Rule 406(b) of the Toxic Substances Control Act of 1992.
   4. NFPA: NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.4 DEFINITIONS

A. Terms:
   1. Abandon:
      a. Remove an item to the extent that it is not visible and does not interfere with new construction.
      b. Portions of the abandoned item may be left in place.
      c. No abandoned items shall be left below new footings.
   2. Demolish:
      a. Remove existing items from their present location in the Project area and haul to an area outside of the Project area.
      b. Remove utilities serving these items.
   3. Relocate:
      a. Move existing items from their present location to another location in the Project area.
      b. Extend utilities serving the present location to the new location.
   4. Remove:
      a. Except for items indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner’s property, demolished materials shall become Contractor’s property.
      b. Remove existing items from their present location in the Project area and haul to an area outside of the Project area.
      c. Remove utilities serving these items.
   5. Replace:
      a. Remove existing items from their present location in the Project area, haul them to an area outside of the Project area, and furnish and install new items in the same or another location.
      b. Extend utilities serving the present location to the new location.
   6. Reuse: Move existing items from their present location to another location in the Project area. Extend utilities serving the present location to the new location.

7. Historic Items:
    a. Historic items, relics, and similar object including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered during selective demolition remain Owner's property.
    b. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1.5 DIVISION OF WORK

A. Work: In accordance with the General Conditions, Contractor is responsible for dividing the Work among the Subcontractors and Suppliers and for delineating the work to be performed by specific trades. The following are suggestions as to how the Work may be divided. This is not a complete list of the work:
    1. Contractor:
        a. Cut and patch walls, floors, and ceilings to allow for recessed utilities and ductwork.
        b. Remove and reinstall existing suspended ceilings to allow for above ceiling construction.
        c. Replace damaged units.
        d. Install new ceilings as indicated on the Drawings.
        e. Place sleeves in new concrete structures.
        f. Patch roof at new penetration and curbs and where existing penetrations and curbs are removed.
        g. Furnish and install new structural steel where required for reinforcement at floor, wall, and roof openings.
        h. Install fire stop and smoke stop systems at penetrations for ratings indicated in accordance with local building codes.
    2. Mechanical, Electrical, and Fire Protection Subcontractors:
        a. Furnish sleeves for use in new concrete construction.
        b. Install fire stop and smoke stop systems at utility penetrations in accordance with local building codes.
        c. Furnish and install sleeves in gypsum board and masonry construction.
        d. Core drill existing concrete for new utilities and sleeves after obtaining Engineer's review of locations.
        e. Remove and reinstall existing fire protection heads to allow for ceiling removal and installation.
        f. Furnish new heads, piping, and connections as required for completion of the Work.
    3. Miscellaneous:
        a. Each trade shall be financially responsible for cutting and patching for sleeves, penetrations, and installation of isolated components as necessary for its work unless herein specifically stated to the contrary.
        b. On renovation projects, cut and patch walls, floors, and ceilings to allow for continuous runs of recessed utilities and ductwork.
        c. Patching shall be done by the trade whose work is damaged.
        d. Costs caused by defective or ill-timed work shall be borne by the party responsible.
        e. Each trade shall do fitting of its own work as required to make its several components fit together or to receive the work of other trades.

1.6 SUBMITTALS

A. Pre-Demolition Audio-Video:
    1. Submit showing existing conditions of construction to remain that could be misconstrued as damage caused by construction activities.
    2. Including building and Site, as well as interior and exterior finishes.
    3. Submit prior to commencing Work.

1.7 QUALITY ASSURANCE

A. Qualifications: Engage an experienced firm that has specialized in demolition work similar to material and extent indicated for this Project.

B. Regulatory Requirements:
    1. Comply with governing EPA notification regulations before beginning selective demolition.
    2. Comply with hauling and disposal regulations of authorities having jurisdiction.

3. Comply with ANSI A10.6 and NFPA 241.
4. Comply with 29 CFR 1926.62-(OSHA Paint Standard).

1.8 PROJECT CONDITIONS

A. Owner Occupancy:
   1. Owner will occupy portions of parking lot immediately adjacent to selective demolition area.
   2. Conduct selective demolition so Owner's operations will not be disrupted.
   3. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Access:
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
   2. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Conditions:
   1. Owner and Engineer assume no responsibility for condition of areas to be selectively demolished.
   2. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as far as practicable.

D. Storage or sale of removed items or materials on Site will not be permitted.

E. Maintenance of Utilities:
   1. Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

F. Unknown Hazardous Materials:
   1. It is not expected that hazardous materials will be encountered in the Work.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner in accordance with the General Conditions.
   3. Hazardous materials will be removed by Owner under a separate contract.

G. Lead Paint: Remove and remediate existing lead paint as required to comply with all codes and requirements while performing the requirements of the Work. Either remove lead paint completely or partially as required to achieve this.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
   1. Materials and workmanship shall conform to the requirements of other Sections of the Specifications.
   2. Where no materials are specified in these specifications, use materials of an equivalent type, quality, and size to match those existing in other areas of the facility.
   3. If none exist, use materials and workmanship recognized as of the highest quality in the industry.
   4. Obtain Engineer's review of such material and workmanship.

B. Piping: Existing piping which is removed from its present location shall not be reused where new piping is required unless specifically noted on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled, and of items to be removed and salvaged.

D. Conflicts:
   1. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict.
   2. Promptly submit written report to Engineer.

E. Survey, or engage a competent person to survey condition of the building, in accordance with requirements of OSHA, to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition operations.

F. Perform additional surveys as the work progresses to detect hazards resulting from operations to date.

3.2 UTILITY SERVICES

A. Maintain existing services indicated to remain and protect them against damage during selective demolition operations.

B. Interruptions:
   1. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and other authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
   3. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.

3.3 PREPARATION

A. Site Access and Temporary Controls:
   1. Conduct selective demolition and debris removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   2. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and other authorities having jurisdiction.
   3. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
   4. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
   5. Protect existing Site improvements, appurtenances, and landscape features to remain.
   6. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line or groups of trees to remain.

B. Temporary Facilities:
   1. Protection:
      a. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
      b. Provide protection to ensure safe passage of people around selective demolition area, and to and from occupied portion of building.
      c. Weather Protection:
         1) Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
         2) Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures.
         3) Coordinate enclosures with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
      d. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
      e. Cover and protect furniture, furnishings, and equipment that have not been removed.

2. Shoring and Bracing:
    a. Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
    b. Strengthen or add new supports when required during progress of selected demolition.

3.4 POLLUTION CONTROLS

A. Dust Control:
1. Use water mist, temporary closures, and other suitable methods to limit spread of dust and dirt.
2. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
3. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure.
4. Vacuum carpeted areas.
5. Comply with governing environmental protection regulations.

B. Disposal:
1. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
2. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

3.5 GENERAL

A. Demolish and remove existing construction only to the extent required by new construction and as indicated.

B. Methods:
1. Use methods required to complete the work within limitations of governing regulations.
2. Level by Level:
    a. Proceed with selective demolition systematically, from higher to lower level.
    b. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
3. Cutting Openings:
    a. Neatly cut openings and holes plumb, square, and true to dimensions required.
    b. Use cutting methods least likely to damage construction to remain or to adjoining construction.
    c. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
    d. Temporarily cover openings to remain.
4. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials, and promptly and legally dispose of off Site.
6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
8. Dispose of demolished items and materials promptly.
9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

C. Existing Facilities: Comply with Owner's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries, and other building facilities during the selective demolition operations.

D. Existing Items to Remain:
1. Protect construction indicated to remain against damage and soiling during selective demolition.
2. When permitted by Engineer, items may be removed to a suitable, protected storage location and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 DEMOLITION

A. Piping, Fire Protection, and Electrical Components:
   1. When a new connection is made to an existing pipeline, install additional new piping, extending to and including the most convenient new valve.
   2. Piping, conduit, and wiring indicated or required to be demolished shall be done so to the nearest reasonable connection outside of the Project area or as directed by Engineer.
   3. Where necessary or required for the purpose of making connections, cut existing pipelines in a manner to provide an approved joint.
   4. Weld beads, flanges, and provide Dresser couplings on existing and new piping.
   5. Furnish new heads, piping, and connections as required for completion of the Work.

B. Nonshrink Grout: Use nonshrink grout for setting wall castings, sleeves, leveling pump bases, doweling anchors into existing concrete and elsewhere as indicated.

C. Protect Facility from Water Damage: Provide flumes, hoses, piping, suitable plugs, bulkheads, or other means to divert or hold back the flow of wastewater, water, or other liquids, as required for proper performance of the Work.

D. Blasting: Not permitted.

E. Sleeves:
   1. Subcontractors for mechanical, electrical, and other trades shall furnish sleeves and inserts for pipes, conduits, and similar items in forms, walls, partitions, and floors.
   2. Perform work in cooperation with Contractor.
   3. Place items in ample time so as not to delay operations.
   4. Do not place sleeves so they pass through beams, girders, and similar construction.

F. Earthwork:
   1. In accordance with Division 31 Section “Excavation and Fill for Utilities.”

3.7 PATCHING AND REFINISHING

A. Promptly repair damage to adjacent construction caused by selective demolition operations.

3.8 CLEANING

A. Clean materials installed under this Section in accordance with Division 01 Section “Cleaning and Waste Management.”

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.

C. Return adjacent areas to conditions existing before selective demolition operations began.

END OF SECTION 02 41 19

SECTION 03 30 03 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of formwork, reinforcement and concrete.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. ACI – American Concrete Institute:
      a. 211.1 – Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
      b. 301 – Specifications for Structural Concrete.
      c. 304R – Guide for Measuring, Mixing, Transporting and Placing Concrete.
      d. 305R – Hot Weather Concreting.
      e. 306R – Cold Weather Concreting.
      f. 309R – Guide for Consolidation of Concrete.
      g. 318 – Building Code Requirements for Structural Concrete.
      h. 347R – Guide to Formwork for Concrete.
   2. ASTM Standard Specifications, Test Methods, and Classifications:
      a. A185 – Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
      b. A615 – Specification for Deformed and Plain Billet – Steel Bars for Concrete Reinforcement.
      c. A1064 – Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
      d. C31 – Practice for Making and Curing Concrete Test Specimens in the Field.
      e. C33 – Specification for Concrete Aggregates.
      f. C39 – Test Method for Compressive Strength of Cylindrical Concrete Specimens.
      g. C94 – Specification for Ready-Mixed Concrete.
      h. C138 – Test Method for Density (Unit Weight), Yield and Air Content (Gravimetric) of Concrete.
      i. C143 – Test Method for Slump of Hydraulic-Cement Concrete.
      j. C150 – Specification for Portland Cement.
      k. C172 – Practice for Sampling Freshly Mixed Concrete.
      l. C173 – Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
      m. C231 – Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
      n. C260 – Specification for Air-Entraining Admixtures for Concrete.
      o. C309 – Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
      p. C494 – Specification for Chemical Admixtures for Concrete.
      q. C595 – Blended Hydraulic Cement.

1.4 DESIGN AND PERFORMANCE REQUIREMENTS

A. Formwork: Perform the design and engineering of formwork, as well as its construction.

1.5 SUBMITTALS

A. Shop Drawings: For reinforcing steel.

B. Mix Designs: Submit for review prior to placing concrete.

1.6 QUALITY ASSURANCE

A. Concrete Material Testing:
   1. Owner will provide the services of an independent concrete testing laboratory.
   2. Point of sampling and method of sampling: In accordance with ASTM C172.
   3. Slump Tests:
      a. Perform slump tests in accordance with ASTM C143.
      b. Perform one slump test on the Site for each load of concrete.
   4. Perform 1 air-entraining test in accordance with ASTM C231 or C173 for each load of concrete.
   5. Test the concrete unit weight in accordance with ASTM C138.
   6. Concrete Cylinder Testing:
      a. In accordance with ASTM C31 and C39.
      b. Take concrete cylinder Samples for each load of concrete.
      c. Concrete cylinder Sample shall consist of a minimum of four 4x8 or 6x12 cylinders.
      d. Handle cylinders carefully.
      e. On Site Storage:
         1) 12 hours, minimum, 48 hours maximum.
         2) At a temperature range of 60 to 80 degrees F and in a moist environment.
         3) Shielded from direct sunlight and radiant heat.
         4) Construct heated or water bath enclosures, as applicable, if conditions require.
      f. Provide laboratory curing for duration of curing after on Site storage.
      g. Test 1 of the cylinders at 7 days and 2 cylinders at 28 days. Save 1 cylinder as a spare.
      h. Acceptance and evaluation of the concrete shall be based on ACI 301.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Formwork:
   1. Form grade plywood or metal panels; no torn edges or worn plywood.
   2. Form Release Agent: Non-staining, non-emulsifiable type.
   3. Form ties, spreaders, and accessories as required by the formwork design.
   4. Provide chamfered strips in exposed corners of concrete.

B. Reinforcement:
   1. Reinforcing Bars:
      a. ASTM A615.
      b. Yield Stress: F_y = 60,000 psi, Grade 60.
   2. Welded Wire Fabric:
      a. ASTM A185 or A1064.
      b. Yield Stress: F_y = 65,000 psi.
   3. Accessories resting on surfaces to be left exposed as finished surfaces shall have plastic coated legs.

C. Concrete Materials:
   1. Portland Cement: ASTM C150, Type I, or A595, Type 1L.
   2. Fly Ash: ASTM C618, Class C or F.
   3. Ground-Granulated Blast Furnace (GGBF) Slag: ASTM C989, Grade 100 or 120.
   4. Fine and Coarse Aggregates:
      a. Inert, non-chemically reactive, and non-radioactive.
      b. Conforming with ASTM C33.
   5. Water: Clean, fresh, and potable.
   6. Air-Entrainment:
      a. ASTM C260.
      b. For all concrete mixes except interior floor slabs and pads.
   7. Water Reducing Agents: ASTM C494.
   8. No calcium chloride allowed in materials used in concrete mix.
   9. Membrane Curing Compounds: ASTM C309.

2.2 CONCRETE MIXES

A. Proportioning:
   1. Proportions of materials for concrete shall be in accordance with ACI 211.1.
   2. Mix Design 1:
      a. Minimum Design Compressive Strength: 4,000 psi.
      b. Minimum Cementitious Content: 6 sacks.
      c. Replacement of Cement by Fly Ash or Slag: Permitted, up to 35% combined.
      d. Water-Cementitious Ratio: 0.44 maximum.
      e. Slump Limits: 4 inches ± 1-inch before addition of water reducer, if any.
      f. Entrained Air Content: 5% ± 1%.

2.3 SOURCE QUALITY CONTROL

A. Production and Delivery:
   1. Batch, mix and transport ready mixed concrete in accordance with ASTM C94.
   2. Furnish ready-mix delivery tickets with each batch of concrete before unloading at the Site, on which is printed, stamped or written the following information:
      a. Name of ready-mix batch plant.
      b. Serial number of ticket.
      c. Date and truck number.
      d. Name of Contractor.
      e. Project name and location.
      f. Specific class of designation of concrete.
      g. Amount of concrete (cubic yards).
      h. Time loaded or of first mixing of cement and aggregates.
      i. Type, name and amount of admixture.
   3. Minor amounts of concrete may be mixed on Site with prior review by Engineer.

PART 3 - EXECUTION

3.1 ERECTION AND PLACEMENT

A. Forms:
   1. Provide required forms, shores, bracing, breast timbers, form ties and accessories in sufficient quantities so as not to delay the work.
   2. Coordinate work with other trades for the installation of embedded items and form penetrations.
   3. Form Removal:
      a. No earlier than 3 days for columns and walls.
      b. No earlier than 7 days for beams and slabs.

B. Reinforcement:
   1. Free from rust scale, loose mill scale, oil, paint, and other coatings which will destroy or reduce bond between steel and concrete at the time concrete is placed around it.
   2. Notify Engineer 24 hours prior to concrete pour for final check of reinforcing placement.

C. Concrete:
   1. Handle concrete from mixer to place of final deposit in carts, buggies or conveyors.
   2. Compact concrete by mechanical vibration equipment, but do not transport concrete through forms by vibrating.
   3. Concrete Finish:
      a. Formed Surfaces: As cast, smooth formed finish.
      b. Unformed Exposed Surfaces:
         1) Interior: Smooth troweled finish unless specified otherwise.
         2) Exterior: Light broomed finish unless specified otherwise.
   4. As soon as possible after finishing or removing forms, treat surfaces with a liquid membrane-forming curing compound unless specified otherwise.
   5. Protect freshly placed concrete from damage due to extreme temperatures in accordance with ACI 305R and ACI 306R.

END OF SECTION 03 30 03

SECTION 09 91 00 – PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and application of coating products, such as paints, stains and sealers, and labeling products.
   1. Surfaces to be painted or finished include, but are not necessarily limited to, the following interior and exterior surfaces for items furnished or installed under this Work, except as otherwise indicated on the Drawings or herein specified:
      a. Machinery and equipment.
      b. Ferrous metals, hangers, structural steel and joist framing.
      c. Galvanized steel.
      d. Exposed pipe and fittings including wall and floor sleeves (if pipe is insulated, insulation shall be painted).
      e. Exposed pipe, fittings, and pipe supports including surfaces between pipes and supports.
      f. Traffic striping.
      g. All other surfaces not specifically excluded in the following paragraph. A completely finished project is required, regardless of whether every individual item is specified herein or indicated on the Drawings to be painted.
   2. Surfaces not to be painted or finished include the following unless otherwise indicated on the Drawings:
      a. Manufacturer's name and identification plates.
      b. Concealed ducts, pipes and conduits.
      c. Aluminum (unless specifically indicated to be painted).
      d. Stainless steel (unless specifically indicated to be painted).
      e. Items with factory applied final finish, such as cabinets, anodized door and window frames, and the like, but excluding machinery and equipment.
      f. Items indicated on the Drawings as not to be painted.

1.3 REFERENCES

A. Except as herein specified or as indicated on Drawings, the work of this Section shall comply with the pertinent provisions of the following:
   1. AASHTO:
      a. M247 - Glass Beads Used in Traffic Paint.
      b. M248 - Ready-Mixed White and Yellow Traffic Paint.
   2. ASME/ANSI: A13.1 - Scheme for the Identification of Piping Systems.
   3. ASTM:
      a. A780 - Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
      b. D16 - Terminology for Paint, Related Coatings, Materials, and Applications.
      c. D520 - Zinc Dust Pigment.
      d. D523 - Test Method for Specular Gloss.
      e. D7234 - Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
      f. F1869 - Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride.
   4. Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers:
      a. Ten States Standards 2.14 - Recommended Standards for Water Works.
      b. International Concrete Repair Institute: Guideline No. 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.
   5. Michigan Administrative Code: R 325.51992 Part 603 - Lead Exposure in Construction.

6. National Association of Pipe Fabricators (NAPF):
   a. NAPF 500-03-01 - Solvent Cleaning for Ductile Iron.
   b. NAPF 500-03-02 - Hand Tool Cleaning for Ductile Iron.
   c. NAPF 500-03-03 - Power Tool Cleaning for Ductile Iron.
   d. NAPF 500-03-04 - Abrasive Blast Cleaning for Ductile Iron Pipe.
   e. NAPF 500-03-05 - Abrasive Blast Cleaning for Cast Ductile Iron Fittings.
7. Steel Structures Painting Council (SSPC):
   a. AB-1 - Mineral and Slag Abrasives.
   b. PA-1 - Shop, Field, and Maintenance Painting of Steel.
   c. PA-2 - Procedure for Determining Conformance to Dry Coating Thickness Requirements.
   d. PA-3 - A Guide to Safety in Paint Application.
   e. SP-1 - Solvent Cleaning.
   f. SP-2 - Hand Tool Cleaning (SSI-St2).
   g. SP-3 - Power Tool Cleaning (SSI-St3).
   h. SP-5 - White Metal Blasting (SSI-Sa3) (NACE #1).
   i. SP-6 - Commercial Blast Cleaning (SSI-Sa2) (NACE #3).
   j. SP-7 - Brush-off Blast (SSI-Sa1) (NACE #4).
   k. SP-8 - Pickling.
   l. SP-10 - Near-White Blast Cleaning (SSI-Sa2-1/2) (NACE #2).
   m. SP-11 - Power Tool Cleaning to Bare Metal.
   n. SP-16 - Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
   o. VIS-1 - Visual Standard for Abrasive Blast Cleaned Steel.
8. United States Department of Labor, Occupational Safety and Health Administration (OSHA): 29 CFR 1926.62.

1.4 DEFINITIONS

A. Terms:
   1. Coating: Paint, stain, sealer or other product specified.
   2. Environment:
      a. Severe: Highly corrosive industrial atmospheres with sustained exposure to high humidity and condensation, frequent cleaning using strong chemicals, heavy concentrations of strong chemical fumes, and frequent splashing and spilling of harsh chemical products.
      b. Moderate: Corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, regular cleaning with strong chemicals, and occasional splashing and spilling of chemical products.
      c. Mild: Industrial atmospheres with normal exposure to moderate humidity and condensation, occasional mold and mildew development, infrequent cleaning with strong chemicals, low levels of mild chemical fumes, occasional splashing and spilling of chemical products, and normal outdoor weathering.
   3. Exposure:
      a. Environmental conditions to which different surfaces may be exposed as follows:
         1) Concealed: Surfaces within the confines of a building or other enclosure not constantly exposed to weather, trapped moisture, high heat or other deteriorating conditions, and normally concealed from view.
         2) Immersed:
            a) Surfaces below a liquid surface or exposed to spray.
            b) Surfaces exposed to spray include areas to 8 inches above maximum liquid surface in quiescent structures and to 18 inches above maximum liquid surface in mixed or agitated structures.
            c) Immersed surfaces also include the interior surfaces of the floors, walls, and tops of fully or partially enclosed liquid containing structures, regardless of the liquid level.
         3) Interior: Surfaces within the confines of a building or other enclosure not immersed or constantly exposed to weather, trapped moisture, high heat or other deteriorating conditions, and exposed to view.
         4) Exterior:
            a) Above Grade: Surfaces above finished grade and not included in 1), 2), or 3) above.
            b) Below Grade: Surfaces below finished grade and not included in 1), 2), or 3) above.

4. Gloss Range (as determined by ASTM D523):
   a. High Gloss: A high sheen finish of more than 70 when measured at a 60 degree meter.
   b. Semi Gloss: A medium sheen finish of 35 - 70 when measured at a 60 degree meter.
   c. Satin: A low-to-medium sheen finish of 15 - 35 when measured at a 60 degree meter.
   d. Eggshell: A low sheen finish of 20 - 35 when measured at a 60 degree meter.
   e. Flat: A lusterless or matte finish of less than 5 when measured at an 60 degree meter.

1.5 SUBMITTALS

A. Manufacturer's Literature: Specification data sheets and color charts for materials proposed for use on the Work. Provide Safety Data Sheets (SDS) as requested by Engineer.

B. Schedules:
   1. Submit a finish schedule indicating rooms and other structures and systems to be coated, items or areas to be coated, the proposed coating system, including surface preparation, primer, intermediate/finish coats, application methods and color charts.
   2. Schedule shall be submitted as a complete package.
   3. No coatings may be applied until Engineer has made a complete review of the entire submittal.

C. Manufacturer's Certificates: Submit signed affidavit from coatings Manufacturer that submitted coatings are of same or better quality than those specified, and Manufacturer’s approval of applicator.

D. Applicator's Experience: Submit written verification of experience required herein.

E. Product and Maintenance Schedules:
   1. At or before the completion of the Work, submit complete lists, in a finish schedule, of the actual products used. Include item covered, coating Manufacturer's name, type of coating and color.
   2. Provide pipe coding schedules listing pipe name, coating Manufacturer's name, type of coating and color.
   3. Provide maintenance manuals detailing the proper procedures and materials to be used for maintenance and repainting of the various coatings.

1.6 QUALITY ASSURANCE

A. General:
   1. Acceptability of materials and performance shall be determined by Engineer.
   2. Testing or certifications may be required to aid Engineer's determination.
      a. Expense of testing and certifications when required and, unless noted otherwise in the Contract Documents, shall be borne by Contractor.
      b. If destructive testing is required, Contractor shall repair damaged area. Expense of repair shall be borne by Contractor.
      c. If initial testing results are unsatisfactory or yield failing results, additional testing will be required. Cost of additional testing shall be borne by Contractor.
   3. Coating Reviews:
      a. Request, in writing, a review of each coat by Engineer of first finished surface of each type for color, texture and workmanship.
      b. First accepted surface of each type and color shall be visibly labeled by Engineer with removable label as Project standard for that type and color of item.
      c. Labels shall remain in place until painting is finished and accepted.
      d. For spray application, paint a surface of 100 square feet as a Project standard.
   4. Work may be inspected as to proper surface preparation, pretreatment, priming, dry film thickness, curing, color, and workmanship.
   5. Applicable standards, test methods, and inspection equipment includes, but is not necessarily limited to the following:
      a. SSPC-VIS-1 photographic blast cleaning standards (latest revision).
      b. Inspector's wet film and dry film thickness gages.
      c. Zorelco 369/PHD pin hole detector.
      d. Mark II Tooke Gage.

B. Coating Subcontractors:
   1. Applicators shall have experience with the coating systems specified.
   2. Experience shall be substantiated by previous project experience, certifications, seminar attendance, Manufacturer validation, or similar means.

C. Pre-Application Meeting:
   1. Convene a pre-application meeting before the start of work and prior to ordering materials.
   2. Require attendance of parties directly affecting work of this Section, including Engineer, applicator and coating Manufacturer's technical representative.
   3. Review the following as a minimum:
      a. Access and safety requirements.
      b. Heating, ventilation and humidity control measures to be utilized.
      c. How application information will be monitored and recorded, including responsible personnel, monitoring equipment, forms, and timely reporting of information recorded.
      d. Protection of surfaces not scheduled to be coated.
      e. Schedule of work.
      f. Surface preparation.
      g. Coating application.
      h. Daily log to be used.
      i. Repairs anticipated.
      j. Applicator's field quality control.
      k. Cleaning procedures.
      l. Testing procedures.
      m. Protection of coating systems.
      n. Coordination with Owner's activities.

D. Manufacturer's Services:
   1. Arrange for Manufacturer's technical representative to provide the services indicated below.
   2. Site Visits by the Manufacturer's Technical Representative:
      a. The pre-application meeting.
      b. A visit to observe surface preparation and review application techniques of components of the system.
      c. A visit to review the completed installation.
   3. Generally provide assurance and guidance for the entire coating system installation.
   4. Written documentation required from the coating system Manufacturer:
      a. A letter of acknowledgement that the coating system materials are specified to be used in a location and for a purpose that meets with the approval of the coating system Manufacturer and the intent of the Contract Documents. The signed letter shall certify that the Manufacturer's technical representative:
         1) Is familiar with the Project, has attended meetings and is aware of the Project conditions and aware of associated products (i.e. filler resurfacers, primers, coatings and other products proposed for the Project).
         2) Agrees with the intended application of their products as specified.
         3) Agrees with the surface preparation specified, as completed.
         4) Agrees with the specifications. If necessary, submit revisions to specifications.
         5) Agrees that their products are compatible with associated products (i.e. concrete repair materials, existing coating systems, and other products proposed for the Project).
         6) Agrees with the type and quantity of testing to be performed, to ensure their product is adequately installed.

E. Installation Subcontractor's Supervising Site Representative:
   1. On Site during work being performed.
   2. Knowledgeable of all aspects of the work.
   3. Review each day's agenda with crew, and with Contractor's and Engineer's Site representatives.
   4. If a portion of the work becomes unclear as to the most appropriate direction, work shall stop until a consensus is reached by all parties, including the Engineer's representative and the Manufacturer's technical representative, as required.

F. Applicator's Project Record:
   1. Applicator shall maintain a record for each day work is performed, and shall include a record of application process information. At a minimum, applicator's record shall include:
      a. Material Manufacturer's batch numbers.
      b. Surfaces to which material is applied.
      c. Time of application.
      d. Ambient temperature.
      e. Substrate temperature.
      f. Substrate moisture.
      g. Relative humidity.
      h. Dew point temperature.
      i. Use of heating, dehumidification and ventilation equipment.
      j. Unusual or important conditions, features, or events that occur before, during or after work is performed that day. Such information shall be referred to on previous or subsequent daily reports, when appropriate.
   2. Submit for Project record.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original sealed containers of the Manufacturer with labels legible and intact. Include the following on labels on each container:
   1. Manufacturer's name.
   2. Type of coating.
   3. Manufacturer's stock number.
   4. Manufacturer's batch identification.
   5. Color name and number.
   6. Instructions for mixing and reducing, where applicable.
   7. Percent total solids by volume.
   8. Identification of toxic substances and special instructions.
   9. VOC content.

B. Storage:
   1. Store materials in tightly covered containers at a minimum ambient temperature of 45 degrees F.
   2. Store materials in a well ventilated area and in such a manner as to comply with safety requirements including applicable federal, state, and local rules and requirements.
   3. Storage shall also be in accordance with instructions of the paint Manufacturer and requirements of insurance underwriters.
   4. Maintain storage containers in a clean condition, free from foreign materials and residue:
      a. Protect from freezing.
      b. Keep storage area neat and orderly.
      c. Remove oily rags and waste daily and dispose of legally.

C. Handle volatile products carefully and use caution so as not to puncture containers. Keep open flame away from areas while handling containers and be aware of material flash points.

1.8 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Waterborne Paints:
      a. Apply only when temperature of surface to be painted and surrounding air are between 50 and 90 degrees F.
      b. Maintain temperature range throughout the minimum cure time recommended by the Manufacturer.
   2. Solvent-Thinned Paints:
      a. Apply only when temperature of surface to be painted and surrounding air are between 45 and 95 degrees F.
      b. Maintain temperature range throughout the minimum cure time recommended by the Manufacturer.

3. Inclement Weather:
   a. Do not apply paint:
      1) In snow, rain, fog, or mist.
      2) When relative humidity exceeds 85%.
      3) When steel temperature is less than 5 degrees F above the dew point.
      4) To damp or wet surfaces.
   b. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the Manufacturer during application and drying periods. Refer to Article 1.7 for further restrictions.

B. Existing Painted Surfaces:
1. When painting is specified over existing painted surfaces and existing coating types are not known, analyze samples of existing coatings using a laboratory approved by Engineer to determine generic type of coating present and the presence of lead.
2. Submit written report from the lab to Engineer before coating is applied.
3. Required modifications to painting schedule caused by existing paint shall not be justification for extra payment.
4. Existing Coat Bonding Failure:
   a. Remove existing coating by abrasive blasting or other means, obtaining surface cleanliness and profile required for coating specified without damaging the substrate to the point of affecting its appearance.
   b. Paint as new surface.
   c. Unforeseen failure conditions may be justification for extra payment.

C. Epoxy Coatings:
1. Do not expose epoxies during application and cure to sunlight and heaters that emit carbon dioxide and carbon monoxide.
2. Use caution when applying and curing epoxy coatings to ensure that surrounding areas are not occupied and that adequate ventilation and fresh air are present.

D. Contractor shall demonstrate acceptability of environmental conditions as required by Engineer.

1.9 EXTRA MATERIALS

A. Leave with Owner at least 1 gallon of each type and color of paint used for finish coats and 1 gallon of each type of thinner required.

B. Containers shall be tightly sealed and clearly labeled.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
1. Coatings:
   a. Tnemec.
   b. Carboline.
   c. International Paint.
   d. Sherwin Williams.
2. Traffic Paint:
   a. Sherwin Williams.
   b. Center Line Supply.
   c. Repcolite.
   d. Or equal.

B. Single Manufacturer:
1. Materials selected for coating systems for each type of surface shall be the product of a single Manufacturer.
2. Provide primers and undercoats produced by the same Manufacturer as the finish coats.

2.2 MATERIALS

A. Material Types:
   1. Paint, primer and related materials are included in the painting schedule in this Section.
   2. Paint used for repair of galvanizing shall have minimum 95% zinc dust in accordance with ASTM D520.

B. Colors: Colors of finish coats shall be as selected by Engineer.

C. Blast Abrasives:
   1. Level of ionic contaminants shall be in accordance with SSPC-AB 1.
   2. Products and Manufacturers:
      a. Magnum Blast by Dust Net, Wedron, Illinois.
      b. Black Magnum by Dust Net, Wedron, Illinois.
      c. Black Beauty by Reed Minerals, Highland, Indiana.

D. VOC Compliance:
   1. Individual coatings and coating systems shall have VOC levels at or below the EPA recommendations identified in 40 CFR Part 59.
   2. VOC content shall be tested in accordance with EPA Method 24.

2.3 MIXES

A. Mixing:
   1. Deliver paints to the Site ready-mixed, when possible.
   2. Mix two-component paints at the Site and observe pot life as recommended by Manufacturer.
   3. Proceed with mixing until paint becomes smooth, homogeneous, and free of surface swirls or pigment lumps.
   4. When mixing multi-component paints, remix each component individually, then blend the components, as recommended by the Manufacturer, until the mixture is completely uniform in color.

B. Thinning:
   1. No thinning will be permitted unless absolutely necessary.
   2. Paint shall be spray-applied in as-received condition to demonstrate necessity for thinning.
   3. Use only thinners as recommended by paint Manufacturer for specific use.
   4. Amount of thinner used shall be reported to Engineer.
   5. Measure viscosity to ensure proper thinning ratios have been used.

C. Tinting:
   1. Onsite tinting will be permitted only when accepted in writing by Engineer.
   2. Use only tinting colors recommended by the Manufacturer for the specific type of coating.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspection:
   1. Prior to the commencement of surface preparation or other coating activities, thoroughly inspect the surfaces to determine if the Work is ready to be prepared and painted.
   2. Report in writing to Engineer conditions that may potentially affect proper application.
   3. Do not commence surface preparation or other coating activities until such defects have been corrected.

B. Correction of Defects:
   1. Correct defects and deficiencies in surfaces which may adversely affect work of this Section.
   2. Apply filler resurfacers, patching materials and the like that are required to provide the surface recommended by the coating Manufacturer.
   3. Start of painting will be construed as the applicator’s acceptance of surfaces and conditions within a particular area.

3.2 TEMPORARY HEATING, VENTILATION AND HUMIDITY CONTROL REQUIREMENTS

A. General:
   1. Ventilation is mandatory.
   2. Provide ventilation that exhausts fumes and odors to the exterior at a location where existing HVAC systems will not pick up these fumes and odors.
   3. Provide negative air pressure to those spaces receiving coatings without reducing air temperatures in those spaces which may impede the curing process of those coating systems.
   4. Ventilation is required during surface preparation, application of coating systems, and the curing period for those systems.
   5. Provide additional equipment and fuel as required to condition the space for surface preparation, application of products, and curing of those products, in accordance with Manufacturer's requirements. This equipment may include, but is not limited to, heaters, dehumidifiers and fans for intake and exhaust air.

B. Enclosures:
   1. Provide temporary enclosures as required to isolate dust, fumes and odors from areas in use, to control temperature and humidity, and to protect surface to be coated from the weather.
   2. The enclosure shall be of such quality as to maintain optimal conditions for the work of this Section.
   3. The enclosure shall remain until the work is sufficiently cured.

3.3 PREPARATION

A. General:
   1. Prepare surfaces in accordance with this Article, the paint Manufacturer's recommendations and as specified in the painting schedule of this Section.
   2. Cleanliness of Abrasive Blast-Cleaned Steel:
      a. Determined by Engineer using Steel Structures Painting Council Manual SSPC-VIS-1.
      b. Small steel panels which have been abrasive blast-cleaned and approved for a specific cleanliness may be used for comparative purposes to facilitate inspection and approval.
      c. Securely wrap these panels in clear plastic, seal to protect them from deterioration and mark with appropriate SSPC-SP6 cleaning specification.
   3. Cleanliness of Compressed Airs:
      a. Do not use contaminated air for blast cleaning.
      b. Periodically check compressed air used for blasting to verify that it is clean, dry and oil-free by directing its flow toward a sheet of clean white paper.
   4. Place oil and water separators in the air line as close as possible to blast-cleaning equipment. Make measurements of surface profile of abrasive blast-cleaned steel with a Keane-Tator Surface Profile Comparator or Testex Press-O-Film and Micrometer.
   5. Abrasive Media:
      a. Select abrasive media to provide the type of profile required by the Manufacturer of the coating product.
      b. Abrasive media shall contain less than 5% free silica sand.
   6. Protective Covers:
      a. Protect motors, bearings, chain drives, and other moving parts by wrapping with plastic and sealing with tape.
      b. Maintain protective covers in dust tight condition.
   7. Correct steel and fabrication defects revealed by surface preparation, such as weld imperfections, delamination, scabs, and slivers, by appropriate trade before proceeding further with surface preparation.
   8. Clean Up of Blast Cleaned Areas:
      a. Remove dust and blast products from the abrasive blast-cleaned surfaces by high pressure air or vacuum cleaning.
      b. Completely clean up residue from blasting operations within the entire space to be painted prior to applying coatings.
   9. Inspect surfaces after surface preparation is complete and prior to application of coatings.

10. Remove hardware, accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface applied protection prior to surface preparation and painting, and then replace items after paint has dried.
11. When acid etching is the approved means of preparing surfaces for coating systems, protect the surrounding areas. Neutralize dispensed solutions and dispose of properly.

B. Ferrous Metals:
   1. Non-Immersed Ferrous Metals:
      a. Surface Preparation - Shop:
         1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1.
         2) Abrasive blast clean surfaces to specification required for coating to be applied.
         3) Perform abrasive blast cleaning only when the relative humidity is no higher than 75% and the surface temperature of the steel is at least 5 degrees F above the dew point.
         4) Coat cleaned surfaces before visible rust forms on the surface. Do not leave cleaned surfaces uncoated for more than 24 hours.
         5) Apply coating as specified under this Section.
      b. Surface Preparation - Field:
         1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1.
         2) Prepare field welds by grinding to remove sharp edges, undercuts, recesses and pin holes.
         3) Completely remove weld slag and spatter.
         4) Thoroughly clean damages, scratches and abraded areas of shop primers. Thoroughly clean field welds and areas within 4 inches of field welds before painting using surface preparation methods at least as effective as those specified for the structure itself.
         5) Feather out edges to make touch-up patches inconspicuous.
         6) Clean surfaces with solvent.
         7) Contractor may, at Contractor's option, clean and apply one overall coat of primer for each specified shop coat in place of touch-up or spot priming.
         8) Contractor shall meet applicable surface preparation and application specifications.
   2. Immersed Ferrous Metals:
      a. Surface Preparation - Field:
         1) Remove dirt, oil, grease and other foreign matter in accordance with SSPC-SP1.
         2) Prepare field welds by grinding to remove sharp edges, undercuts, recesses, and pin holes.
         3) Completely remove weld slag and spatter.
         4) Abrasive blast clean surfaces to specification required for coating to be applied.
         5) Perform abrasive blast cleaning only when the relative humidity is no higher than 75% and the surface temperature of the steel is at least 5 degrees F above the dew point.
         6) Coat cleaned surfaces before any visible rust forms on the surface.
         7) Do not leave cleaned surfaces uncoated for more than 24 hours.
         8) Apply coating as specified under this Section.

C. Ductile Iron Pipe and Fittings:
   1. Do not follow preparation procedures typically used for other ferrous metals as these may result in damage to the ductile pipe surface and subsequent reduced coating effectiveness and life expectancy.
   2. Perform surface preparation in accordance with NAPF 500-03-01 through 05 and the painting schedule.

3.4 APPLICATION

A. General:
   1. Take necessary safety precautions in accordance with this Article, SSPC-PA Guide 3, Manufacturer's recommendations, federal, state, and local rules and requirements, and insurance underwriter's guidelines.
   2. Apply coatings in accordance with this Article, SSPC-PA1, and the Manufacturer's recommendations.
   3. Moisture Content:
      a. Do not apply initial coating until moisture content of surface is within limitations recommended by paint Manufacturer.
      b. Determine moisture content by one of the following methods:
         1) As specified herein.
         2) By use of a moisture meter approved by Engineer.

4. Mil Thickness:
   a. Apply coats in a uniform manner and of the minimum dry film thickness as indicated in the painting schedule.
   b. Maximum mil thickness shall be as recommended by coating Manufacturer.
   c. Where the mil thickness is not indicated in the painting schedule, it shall be as recommended by coating Manufacturer.
5. Sand and dust between each coat to remove defects visible from a distance of 5 feet.
6. Additional Coats:
   a. Apply within recoat recommendation of the Manufacturer based on temperature and humidity variations.
   b. Schedule inspections so as to not interfere with recoat time.
7. Each coat shall be smooth, free of brush marks, streaks, laps or pile-up of paint, and skipped or missed areas.
8. Make edges of paint adjoining other materials or colors clean and sharp with no overlapping.
9. Spray apply coatings on hollow metal units.
10. Finish door tops, edges, and bottoms the same as exposed surfaces.
11. Except for contact surfaces, surfaces of fabricated assemblies that are inaccessible after erection shall receive field coats of paint before erection.
12. Ensure that concrete cracks and defects have been repaired prior to applying coating, then fill remaining depressions and crevices with paint if practical.
13. Protect wet paint against damage from dust or other detrimental foreign matter as much as is practicable.
14. Remove grills, covers, and access panels of mechanical and electrical systems and tanks from location and paint separately.
15. Paint the interior surface of ducts flat black in the immediate area of supply and exhaust grilles.
16. Omit application of masonry filler on acoustical masonry.
17. Coat concrete and masonry walls prior to mounting equipment.
18. Where equipment, piping, conduit or the like are removed from an existing painted surface, patch and paint the newly exposed surface as required so the newly exposed surface matches surrounding surfaces in coating and appearance.
19. Where epoxy coatings are scheduled over existing paint:
   a. Test existing paint and substrate for lifting or alligatoring.
   b. If existing paint lifts or alligators, remove it down to bare substrate.
20. Where a portion of a surface is to be coated, carry the coating to the nearest break point in the surface plane beyond the portion specified.

B. Valves, Fittings, and Supports:
1. Paint valves and fittings the same base color as the pipe they adjoin.
2. Paint floor stands the same base color as the pipe they adjoin.
3. Wall Brackets and Pipe Hangers:
   a. Paint the same base color as the wall or ceiling they adjoin.
   b. Use gray color if wall or ceiling is not painted.

3.5 PIPE AND EQUIPMENT IDENTIFICATION

A. General:
1. Identify non-buried piping installed as part of the Work in accordance with ASME/ANSI A13.1, this Section, as required in the pipe identification schedule, and as indicated on the Drawings.
2. Painting or banding of concealed piping above suspended ceilings is not required, but labels as specified following are required.
3. Identify pumps, tanks, and equipment.

B. Color Bands:
1. Where color bands are indicated for piping identification, use colored vinyl tape spaced every 6 feet, before and after each valve and where pipe enters and leaves each wall.
2. Band Widths:
   a. Pipe up to and including 2-inch diameter: 3/4-inch wide.
   b. Pipe 2-1/2-inch to 6-inch diameter: 2 inches wide.
   c. Pipe 8-inch to 12-inch diameter: 4 inches wide.
   d. Pipe 14-inch diameter and over: 6 inches wide.

C. Labels and Arrows:
   1. Label pipes at intervals not to exceed 20 feet and where pipe enters and leaves each wall, to identify the contents of the pipe as determined by Engineer.
   2. Place an arrow adjacent to every pipe label to indicate direction(s) of flow.
   3. Use preprinted labels and arrows manufactured by a company which normally manufactures pipe identification systems.
   4. Supply pipe labels, arrows, and color bands by a single Manufacturer.
   5. Labels and Arrow Heights:
      a. Pipe or Covering Over 3-inch Diameter: 2-1/4 inches.
      b. Pipe or Covering 1-inch to 3-inch Diameter: 1-1/8 inches.
      c. Pipe or Covering Under 1-inch Diameter: 1/2-inch.
   6. Materials shall be suitable for the use intended.
   7. Label pumps, tanks, and equipment items, including description and tag number, with lettering size coordinated with Engineer depending on equipment size.

3.6 TRAFFIC MARKING PAINT

A. Parking spaces shall be marked with 4-inch wide lines as indicated on the Drawings.

B. Traffic paint shall meet requirements of AASHTO M248, Type N.
   1. Striping shall be blue.
   2. Apply traffic paint at rate of 320 feet of 4 inches wide stripe per gallon.

3.7 FIELD QUALITY CONTROL

A. Inspection:
   1. To facilitate painting and inspection, each coat of paint shall be of a different color or tint.
   2. Finished metal surfaces shall be free of skips, voids or pinholes in each coat when tested with a low voltage detector.
   3. Do not apply additional coats until previous coat has been inspected and acknowledged in writing by Engineer.
   4. Only coats of paint acknowledged in writing will be considered in determining number of coats applied.

B. Final Touch-Up:
   1. Surface damage shall be repaired with touch-up paint matching material used for original coating.
   2. Repaired areas shall be rubbed out and polished to match surrounding finish.
   3. Finish repair shall be of the quality typically found within the auto body industry.

3.8 CLEANING

A. Remove spilled, splashed, or spattered paint from surfaces.

B. Do not mar surface finish of item being cleaned.

C. Prior to acceptance of the work of this Section, thoroughly clean painted surfaces and related areas in accordance with Division 01 Section “Cleaning and Waste Management.”

3.9 PROTECTION

A. General:
   1. Adequately protect other surfaces from paint and damage.
   2. Repair damage as a result of inadequate or unsuitable protection.

B. Protective Materials: Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

C. Fire Hazards: Place cotton waste, cloths, and materials which may constitute a fire hazard in closed metal containers and remove daily from Site.

D. Electrical Plates and Hardware:
   1. Remove electrical plates, surface hardware, fittings and fastenings prior to painting operations.
   2. These items are to be carefully stored, cleaned and replaced upon completion of work in each area.
   3. Do not use solvent to clean hardware that may remove permanent lacquer finish.

E. Equipment with Factory-Applied Final Finishes:
   1. Certain equipment with factory-applied finishes may be accepted by Engineer at Engineer's discretion.
   2. Protect finishes of equipment with approved factory-applied final finishes from scratches and abrasions by all practical means.
   3. Repair surface damage with touch-up paint furnished by equipment Manufacturer by workmen skilled in this type of work.
   4. Rub out and polish repaired areas to match surrounding finish.
   5. Finish repair shall be of the quality typically found within the auto body industry.
   6. If damage to item is severe in the judgment of Engineer, the equipment will be rejected or a new finish coat shall be applied after proper surface preparation at the discretion of Engineer, at no additional cost to Owner.

3.10 PAINTING SCHEDULE

A. All mil thicknesses indicated are dry film thicknesses (DFT).

1. Exterior Ferrous Metals – Non-Immersed: Gloss Zinc/Aliphatic Acrylic Polyurethane System:

System Manufacturer	Surface Preparation	First Coat	Second Coat	Third Coat
Tnemec	(Shop): SSPC-SP6 commercial blast cleaning	(Shop) and (Field Touch-up, Prime): 90-97 Tneme-Zinc 2.5-3.5 Mils	(Field): 69-Hi-Build Epoxoline 4.0-6.0 Mils	(Field): 1094 Endura-Shield 2.0-3.0 Mils
Carboline	(Shop): SSPC-SP6 commercial blast cleaning	(Shop) and (Field Touch-up, Prime): Carbozinc 859 2.5-3.5 Mils	(Field): Carboguard 890 4.0-6.0 Mils	(Field): Carbothane 134HG 2.0-3.0 Mils
International Paint	(Shop): SSPC-SP6 commercial blast cleaning	(Shop) and (Field Touch-up, Prime): CATHCOAT 302 H Reinforced Inorganic Zinc 2.5-3.5 Mils	(Field): BAR-RUST 235 Epoxy Mastic 4.0-6.0 Mils	(Field): DEVTHANE 379/H Aliphatic Urethane Gloss 2.0-3.0 Mils
Sherwin Williams	(Shop): SSPC-SP6 commercial blast cleaning	(Shop) and (Field Touch-up, Prime): Corothane | Galvapac 1K 2.5-3.5 Mils	(Field): Macropoxy 646 FC 4.0-6.0 Mils	(Field): Acrolon 218HS/HS Polyurethane 2.0-3.0 Mils

2. Bituminous or Concrete Pavement: Traffic Paint:

System Manufacturer	Surface Preparation	First Coat
As specified	(Field): Clean and dry	(Field): Traffic marking paint 15 wet mils

3.11 PIPE IDENTIFICATION COLOR SCHEDULE

A. Identify exposed pipes with the following colors.
   1. Colors are from the Tnemec Colorbook color card.
   2. Equivalent colors of other Manufacturers indicated in Part 2 of this Section may be used.

B. Where a facility has an existing identification system already in use, coordinate with the system in use.

C. In situations where 2 colors do not have sufficient contrast to easily differentiate between them, paint a 6-inch band of contrasting color at 30-inch intervals.

Water Plant Piping	Color Description	Colorbook ID
Sludge Lines	Dark Brown	Dark Brown (Koppers); Chipmunk TB23 (Tnemec)

END OF SECTION 09 91 00

SECTION 31 10 13 – SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the major items listed below:
   1. Clearing Site of above-grade trees, grass and plant life.
   2. Relocating trees.
   3. Removal of the following man-made items:
      a. Fences.
      b. Similar improvements as indicated on the Drawings.
   4. Removal of roots and stumps.
   5. Removal of exposed rocks, boulders and debris.
   6. Stripping and removal of sod.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the Work of this Section shall comply with the following:
   1. State DOT Current Standards:
      a. Specifications for Construction.
      b. Standard Plans.

1.4 DEFINITIONS

A. Terms: Surface Improvements: Pavement, walks, drives, curbs, curb and gutter, improved lawns, monuments, property irons, reference points and similar improvements.

1.5 SUBMITTALS

A. Permit to Store or Dump Removed Materials:
   1. On property owned, leased or occupied by someone other than Owner.
   2. Submit prior to storing or dumping.
   3. Permit shall absolve Owner from responsibility for storing or dumping.

1.6 QUALITY ASSURANCE

A. Trimming: Trimming of limbs and branches and the painting of tree wounds shall be actively supervised by a member of one of the following:
   1. ASCA - American Society of Consulting Arborists.
   2. ISA - International Society of Arboriculture.
   3. NAA - National Arborist Associations.

B. Interference:
   1. Ensure that Site preparation work does not unduly interfere with pedestrian and vehicular traffic.
   2. Obtain Engineer's and governing authority's approvals prior to closing a public street.

1.7 PROJECT CONDITIONS

A. Burning: Not permitted.

B. Burial: Not permitted.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Soil Erosion Control: Provide soil erosion control in accordance with Division 31 Section “Erosion and Sedimentation Controls” prior to starting Site preparation work.

B. Protection of Trees and Shrubs:
   1. Protect trees and shrubs which are to remain from permanent damage by construction operations.
   2. Prevent vehicles from driving within area under dripline of trees which are to remain.

C. Relocation of trees to be in accordance with City of Ann Arbor standard details.

D. Maintain designated temporary roadways, walkways, and detours for vehicular and pedestrian traffic.

3.2 APPLICATION

A. Clearing:
   1. Remove items requiring removal under this Section from area indicated on Drawings.
   2. Remove roots, rocks and boulders to a depth of 2 feet below finish grade in the following areas:
      a. Proposed buildings or structures.
      b. Proposed pavements and walks.
      c. Other areas where compaction of the subgrade is required.

B. Removal of Sod: Cut to a straight line at the expected excavation limits with sod cutter.

C. Prevent Construction Operations from Damaging or Disturbing:
   1. Trees or roots of trees which are to remain.
   2. Surface improvements which are to remain.

3.3 DISPOSAL OF EXCESS MATERIAL

A. General:
   1. Remove and properly dispose of all material not needed to complete Project.
   2. Dispose of excess material at a location off the Site.
   3. Dispose of excess topsoil at a location off the Site.
   4. Disposal of materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
   5. Provide adequate controls to maintain disposal sites in a neat and safe conditions by periodic leveling of material, the control of erosion and such other practices as are necessary.

END OF SECTION 31 10 13

SECTION 31 22 00 – GRADING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of the major items listed below:
   1. Excavation.
   2. Cutting and filling.
   3. Rough and finish grading.
   4. Disposal of excavated materials.
   5. Topsoil.
   6. Excess water control.
   7. Pavement subgrade.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. AOAC - Association of Official Agricultural Chemists: Methods of Testing.
   2. ASTM Standards:
      a. D422 - Method for Particle-Size Analysis of Soils.
      b. D698 - Laboratory Compaction Characteristics of Soil Using Standard Effort.
      c. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
      d. D2487 - Classification of Soils for Engineering Purposes.
   3. State DOT Current Standards:
      a. Specifications for Construction.
      b. Standard Plans.

1.4 DEFINITIONS

A. Terms:
   1. Driving Surface: A pavement, curb, or sidewalk.
   2. Excavation:
      a. Removing the following materials from their present location:
         1) Native below-grade material such as soil, rocks, boulders less than 1/2 cubic yard in volume, and buried trees.
         2) Man-made items such as, but not necessarily limited to:
            a) Bituminous and concrete paving.
            b) Curbs.
            c) Riprap.
            d) Head walls.
            e) Underground utilities.
            f) Manholes and catch basins.
            g) Foundations.
            h) Sidewalks.
   3. Fill: Soil, native material, imported material or other material which is placed over the subgrade, or excavated areas; under roadways, parking areas, walks, buildings, or structures; and anywhere else on the Site.
   4. Grading: The act of moving soil from one location on the Site to another to achieve the contours and elevations as indicated on the Drawings and as herein specified.
   5. Hardpan:
      a. Cemented soil layers.
      b. Is not hard clay layers that are not cemented.

6. Imported Material: Soil material which is purchased by Contractor and hauled onto the Site.
7. Native Material: Soil and other natural earth materials, except rock, which are existing on the Site prior to the start of Work.
8. Pavement: Any combination of subbase, base course and concrete, bituminous or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, and bituminous seal coat.
9. Rock Excavation:
    a. Excavation of igneous, metamorphic or sedimentary rock or hardpan which cannot be excavated without continuous drilling or blasting or continuous use of a ripper or other special equipment.
    b. Excavation of boulders of 1/2 cubic yard or more in volume.
10. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.
11. Subbase: The layer of material placed on the subgrade as part of the pavement structure.
12. Subgrade:
    a. Below structures and below fill on the Site: The top elevation of the undisturbed native material after all topsoil is stripped off and excavation is completed.
    b. Below driving surfaces: The bottom elevation of the subbase.
13. Surface Improvement: All improvements beyond what might be encountered in an open unimproved field.
14. Undercut: Excavation of native material from below the bottom of footings, floors, structures, and subbases.
15. Utility Structure: Manhole, catch basin, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
16. Other Definitions: Other earthwork terms not defined in the Contract Documents shall be as defined in state DOT Standard Specifications for Construction.

1.5 DESIGN AND PERFORMANCE REQUIREMENTS

A. Quantities: Determine the required quantities of all earthwork materials and operations and use as the basis for the lump sum Bid.

1.6 QUALITY ASSURANCE

A. Testing will be performed in accordance with Division 01 Section “Testing Services for Buried Utilities, Roadways, and Site Projects” and the Contractors Quality Control Plan.

B. Compaction:
1. Predominately Granular Soils:
    a. Density shall be determined by using the modified Proctor method, ASTM D1557.
    b. Compact fill to at least 95% maximum density.
    c. The first 12 inches of subgrade below all driving surfaces, structures, utility structures, and fill on the Site:
        1) Shall be tested for density.
        2) Compact to at least 95% maximum density if the existing density is below 95%.
2. Predominately Cohesive Soils:
    a. Density shall be determined by using the standard Proctor method, ASTM D698.
    b. Compact fill to at least 98% maximum density.
    c. The first 12 inches of subgrade below all driving surfaces, structures, utility structures, and fill on the Site:
        1) Shall be tested for density.
        2) Compact to at least 98% maximum density if the existing density is below 95%.

1.7 PROJECT CONDITIONS

A. Dust Control:
1. Use all legal means necessary to control dust on and near the Work and on and near all off-site borrow areas if such dust is caused by Contractor's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
2. Treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.

3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every Friday afternoon, or more often as necessary if directed by Engineer. Utilize vacuum if dust from brooming is excessive in opinion of Engineer.

B. Existing Structures, Utility Structures, and Utilities:
   1. Call MISS DIG to locate all existing underground utilities prior to starting excavation.
   2. Where utilities, utility structures, or structures are encountered which are in active use:
      a. Provide adequate protection for them.
      b. Be responsible for damages to them.
   3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
   4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours notice to the affected occupants of the time and duration of the anticipated shut off.
   5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
   6. Raise, lower, or move underground utilities, utility structures, or structures which interfere with the utility, utility structure, or structure being constructed as part of this Work.

C. Special Filling Requirements:
   1. Comply with the regulations of the state DOT, county road, and railroad company engineering departments with regard to placing fill and compaction in their respective rights-of-way.
   2. Obtain necessary permits for filling activities off Site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
   1. Approval Required: All material shall be subject to the approval of Engineer or independent testing laboratory.
   2. Notification: For approval of imported material, notify Engineer or independent testing laboratory at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit Engineer or independent testing laboratory to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.

B. Material Sources and Uses:
   1. Imported Material:
      a. Fill in undercut.
      b. Fill below structures, utility structures, or driving surfaces.
      c. Stone stabilization course.
   2. Native material, unless quantity is not sufficient; then shall be imported material.
      a. Fill not below structures, utility structures, or driving surfaces.
      b. Topsoil.

C. Fill In Undercut: MDOT 902, Granular Material Class II.

D. Fill below structures, utility structures, or driving surfaces: MDOT 902, Granular Material Class II.

E. Stone Stabilization Course:
   1. Crushed Stone: 1-1/2 inches maximum size.
   2. Filter Fabric:
      a. By Mirafi; Amoco; Exxon; Nicolon; or equal.
      b. Monofilament polypropylene woven fabric.
      c. Equivalent opening size of 70.

F. Fill Not Below Structures, Utility Structures, or Driving Surfaces:
   1. Native material.
   2. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
   3. Containing no rocks or lumps over 3 inches in greatest dimension.
   4. Obtain approval for using native material as fill from Engineer or independent testing laboratory.

G. Topsoil:
1. Fertile, friable soil, containing a minimum of 2.5% and maximum 12% of organic matter as determined by the Loss on Ignition Test, AOAC, with not more than 50% clay and not more than 55% sand as determined in accordance with ASTM D422.
2. At least 90% of the material shall pass the No. 10 sieve.
3. Topsoil shall be free of refuse or all material toxic to plant growth. Ensure that the topsoil is contamination-free and clean at the source prior to transport to Site.
4. Topsoil shall be free of subsoil and stumps, roots, brush, stones or similar objects larger than 1-inch diameter.
5. Ordinary sods and herbaceous growth, like grass, need not be removed, but shall be thoroughly broken up and intermixed with soil during handling operations.
6. Topsoil, unless otherwise specified or approved, shall have, according to Methods of Testing by the AOAC, acidity range of approximately 5.5 pH to 7.6 pH or as approved by Engineer prior to delivery.

2.2 OTHER MATERIALS

A. All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by Contractor subject to the approval of Engineer or independent testing laboratory.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Topsoil:
1. Remove all topsoil to depth at which subsoil is encountered, from all areas under buildings, driving surfaces, and from all areas which are to be cut to lower grades or filled.
2. With Engineer's approval, topsoil to be used for finish grading may be stored on the Site.
3. Other topsoil may be used for fill in noncritical areas with approval of Engineer.

B. Obstructions:
1. Remove and dispose of buried trees, rocks, boulders, driving surfaces, pipes and the like, as required for the performance of the Work.
2. Exercise care in excavating around catch basins, inlets, and manholes.
3. Avoid removing or loosening castings or pushing dirt into utility structures.
4. Repair or replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to Owner.

C. Cutting Paved Surfaces and Similar Improvements:
1. All cuts shall be a minimum of 1-foot wider than trench on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
2. Before removing pavement, mark the pavement neatly, paralleling pipe lines and existing street lines. Space the marks the width of the trench.
3. Concrete:
   a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
   b. Sidewalks: Remove to joints.
   c. Curb and gutter: Remove to joints.
4. Final surface Course Bituminous: Saw cut joints unless otherwise approved by Engineer.
5. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
6. Contractor may tunnel under curbs that are encountered. Replace curb disturbed by construction.
7. Dispose of materials removed.

D. Utilities To Be Abandoned:
1. When pipes, conduits, sewers, or other utilities or utility structures are removed from the excavation leaving dead ends in the ground, fully plug such ends with brick and mortar.
2. Entirely remove abandoned utility structures unless otherwise specified or indicated on the Drawings.
3. Remove from the excavation all materials which can be readily salvaged and store on the Site.
4. All salvageable materials will remain the property of Owner unless otherwise indicated by Owner.

E. Undercut:
   1. If soft material, which in the opinion of Engineer or independent testing laboratory is not suitable, is encountered below a structure, utility structure, or driving surface, Engineer may order the removal of this soft material and its replacement with specified material in order to make a suitable foundation for the construction of the structure, utility structure, or driving surface.
   2. All undercutting made at the order of Engineer will be paid for on the basis of the actual quantity of material excavated. Do not proceed further until instructions are received and necessary measurements made for purposes of establishing additional volume of excavation.
   3. No extra payment will be made if removal is required as a result of poor dewatering techniques.
   4. Undercutting which is specifically indicated on the Drawings or herein specified, shall be included in the base Bid.
   5. Soil removed may be used as fill in areas not below driving surfaces, structures, or utility structures.
   6. Compact subgrade at bottom of undercut prior to placing fill.
   7. Place and compact specified fill in undercut.
   8. Lateral extent of undercut shall be a horizontal distance equal to the depth of undercut below structure, utility structure, or driving surface.

F. Excavating:
   1. All excavation shall be by open cut from the surface except as herein specified or as indicated on the Drawings.
   2. If required because of excess water conditions, place stone stabilization course prior to proceeding with construction. Place filter fabric over stone stabilization course.

G. Rock Excavation:
   1. Notify Engineer prior to removal if rock is encountered.
   2. Where rock is encountered within the excavation, expose the surface of the rock sufficient to permit adequate measurements to be taken before the rock excavation is started.

3.2 FILL

A. General:
   1. Do not place fill until the subgrade been examined by Engineer or independent testing laboratory.
   2. Place fill in even layers not exceeding 10 inches in depth and thoroughly compact as herein specified.
   3. Do not place additional fill until compaction on a lift complies with specification requirements.
   4. If an analysis of the soil being placed shows a marked difference from 1 location to another, the fill being placed shall not be made up of a mixture of these materials.
   5. Handle each different type of material continuously so that field control of moisture and density may be based upon a known type of material.
   6. Do not place fill following a heavy rain without first making certain on isolated test areas that compaction can be obtained without damage to the already compacted fill.
   7. Do not place fill on frozen subgrade.

B. Compaction:
   1. Select compaction equipment to achieve the required compaction without damaging adjacent structures, utility structures, or driving surfaces.
   2. Suggested Equipment Selections:
      a. If soil is predominantly granular, use pneumatic tired or vibratory drum rollers loaded to not less than 325 pounds in accordance with rated inch of tire width.
      b. For clay fills, compact each layer with sheepsfoot rollers. Rollers shall have staggered rows of feet projecting not less than 7 inches from drum and shall be loaded to produce at least 200 pounds per square inch of tamping area in contact with the ground.
      c. Compact around structures and utility structures with hand operated vibrating compactors for granular soils and Barco rammer type compactors for clay soils.

C. Moisture:
   1. Compact all fill with the moisture content as specified.
   2. If fill material is too wet, provide and operate approved means to assist the drying of the fill until suitable for compaction.
   3. If fill material is too dry, provide and operate approved means to add moisture to the fill layers.

3.3 GRADING

A. General:
   1. Perform all rough and finish grading required to attain the elevations indicated on the Drawings.
   2. Perform rough grading to an accuracy of ± 0.10 feet.
   3. Perform finish grading to an accuracy of ± 0.05 feet.
   4. Comply with all excavating and fill requirements specified herein during grading operations.

B. Grading Around Buildings: Control the grading around buildings so the ground is pitched to prevent water from running into the excavated areas of a building or damaging other Site features.

C. Treatment After Completion of Grading:
   1. After grading is completed, permit no further excavation, filling, or grading, except with the approval of Engineer.
   2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

D. Topsoil: All graded areas, outside of buildings and driving surfaces, shall receive 4 inches of topsoil.

3.4 EXCESS WATER CONTROL

A. Regulations and Permits: Comply with soil erosion control permits in accordance with Mich. P.A. 451, Part 91 of 1994, the Natural Resource and Environmental Protection Act, and all pertinent rules, laws, and regulations.

B. Unfavorable Weather:
   1. Do not place, spread, or roll any fill material during unfavorable weather conditions.
   2. Do not resume operations until moisture content and fill density are satisfactory to Engineer or independent testing laboratory.

C. Pumping and Drainage:
   1. Provide, maintain, and use at all times during construction adequate means and devices to promptly remove and dispose of all water from every source entering the excavations or other parts of the Work.
   2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains or other methods as is necessary.
   3. Perform Pumping and Drainage:
      a. In such a manner to cause no damage to property or structures and without interference to the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors.
      b. In accordance with all pertinent laws, rules, ordinances and regulations.
   4. Do not overload or obstruct existing drainage facilities.
   5. Provide berms or channels to prevent flooding of subgrade. Promptly remove all water collected in depressions.

3.5 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. General:
   1. Remove and properly dispose of all excavated material not needed to complete filling and grading.
   2. Dispose of excess excavated material at a location off the Site.
   3. Dispose of excess topsoil at a location off the Site.
   4. Disposal of all materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
   5. Provide adequate controls to maintain disposal sites in a neat and safe conditions by periodic leveling of material and such other practices as are necessary.
   6. Provide all soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

3.6 CLEANUP

A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to Engineer, and in accordance with Division 01 Section “Cleaning and Waste Management.”

END OF SECTION 31 22 00

SECTION 31 23 03 – EXCAVATION AND FILL FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of the major items listed below:
   1. Excavation and trenching in earth and in rock.
   2. Disposal of items from clearing and unsuitable or excess excavated materials.
   3. Complete drainage of excavations.
   4. Temporary or permanent sheeting, bracing and shoring of excavations.
   5. Installation of normal and special foundations, bedding and backfill materials.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. ASTM Standard Specifications:
      a. D1556 - Density and Unit Weight of Soil In Place by the Sand-Cone Method.
      b. D1557 - Laboratory Compaction Characteristics of Soil Using Modified Effort.
      c. D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
      d. D2922 - Density of Soil and Soil-Aggregate in Place by Nuclear Methods.
   2. State DOT Current Standards:
      a. Specifications for Construction.

1.4 DEFINITIONS

A. Terms:
   1. Bedding: The material placed around a utility between 4 inches below to 12 inches above the utility the full width of the trench.
   2. Driving Surface: A pavement, curb, or sidewalk.
   3. Excavation:
      a. Removing the following materials from their present location:
         1) Native below-grade material such as soil, rocks, boulders less than 1/2 cubic yard in volume, and buried trees.
         2) Man-made items such as, but not necessarily limited to:
            a) Bituminous and concrete paving.
            b) Curbs.
            c) Riprap.
            d) Head walls.
            e) Underground utilities.
            f) Manholes and catch basins.
            g) Foundations.
            h) Sidewalks.
   4. Extra Earth Excavation: Excavation of native material from below the normal trench bottom.
   5. Foundation Material: The material placed in a trench undercut to replace extra earth excavation.
   6. Hardpan:
      a. Cemented soil layers.
      b. Is not hard clay layers that are not cemented.
   7. Imported Material: Soil material which is purchased by Contractor and hauled onto the Site.
   8. Native Material: Soil and other natural earth materials, except rock, which are existing on the Site prior to the start of Work.

9. Normal Trench Bottom: The surface of the undisturbed native material at an elevation 4 inches below the bottom of the utility.
10. Pavement: Any combination of subbase, base course and concrete, bituminous or aggregate surface course, including shoulders, placed on a subgrade. Includes roadways, parking areas, driveways, and bituminous seal coat.
11. Rock Excavation:
    a. Excavation of igneous, metamorphic or sedimentary rock or hardpan which cannot be excavated without continuous drilling and blasting or continuous use of a ripper or other special equipment.
    b. Excavation of boulders of 1/2 cubic yard or more in volume.
12. Special Foundations:
    a. Specially constructed systems for support of underground utilities such as timber piling, concrete foundations and surcharge techniques.
    b. Extra earth excavation and placing imported or native materials are not special foundations.
13. Structure: A building, retaining wall, tank, footing, slab, or other similar construction.
14. Suitable Material:
    a. Native material excavated from the trench and approved as backfill by Engineer or independent testing laboratory.
    b. Not used under or within 1 on 1 slope of driving surfaces or structures.
    c. Placed between the top of the bedding or trench backfill as indicated on the Drawings and the bottom of the surface restoration.
15. Trench Backfill:
    a. The material placed between the top of bedding and the bottom of suitable material, the surface restoration or driving surface, as indicated on the Drawings.
    b. Used under and within 1 on 1 slope of driving surfaces or structures.
16. Utility Structure: Manhole, catch basin, valve chamber, junction chamber, water main valve, or other similar utility appurtenance.
17. Other Definitions: Other earthwork terms not defined herein or in the Contract Documents shall be as defined in state DOT Standard Specifications for Construction.

1.5 DESIGN AND PERFORMANCE REQUIREMENTS

A. Trench Bottom Suitability:
1. Be responsible for the suitability of the normal trench bottom in supporting the utility, bedding and backfill.
2. Notify Engineer and await Engineer's decision if a possible unsuitable condition exists.
3. Poor dewatering techniques or lack of excess water control shall not be a reason for additional payment for remedial measures.

B. Trench Wall Stability:
1. Be responsible for the trench configuration, including sheeting, shoring and bracing necessary to support trench side walls from collapsing.
2. Be responsible for the structural design and stability of a pipe-laying box if utilized on the Project to prevent trench walls from collapsing.

1.6 QUALITY ASSURANCE

A. Testing: Testing will be performed in accordance with Division 01 Section "Testing Services for Buried Utilities, Roadways, and Site Projects." and the Contractor’s Quality Control Plan.

B. Compaction:
1. Determine density by the modified Proctor method, ASTM D1557.
2. Compact granular trench backfill and bedding to at least 95% maximum density.
3. Compact suitable backfill material to at least 90% maximum density.
4. The first 12 inches of native material at the bottom of utility trenches:
    a. Test for density.
    b. Compact to at least 95% maximum density (modified proctor) if the existing density is below 95% maximum density (MP).
    c. Compact clay soil to at least 98% maximum density in accordance with standard proctor ASTM D698, if below 98% maximum density (SP).

1.7 SUBMITTALS

A. Action Submittals: For imported materials:
   1. Source.
   2. State DOT classification.
   3. Sieve Analysis.

1.8 PROJECT CONDITIONS

A. Dust Control:
   1. Use all legal means necessary to control dust on and near the Work and on and near off-site borrow areas if such dust is caused by Contractor's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
   2. Moisten or otherwise treat haul roads, delivery roads, temporary site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site.
   3. Scrape, broom, or vacuum adjacent streets to remove tracked dirt every Friday afternoon, or more as necessary if directed by Engineer. Utilize vacuum if dust from brooming is excessive in opinion of Engineer.

B. Existing Structures, Utility Structures, and Utilities:
   1. Call MISS DIG to locate existing underground utilities prior to starting excavation.
   2. Where utilities, utility structures or structures are encountered which are in active use:
      a. Provide adequate protection for them.
      b. Be responsible for damage to them.
   3. Provide stand-by utility service if temporary removal is necessary for a period exceeding 2 hours.
   4. Where utility service connections to occupied buildings must be temporarily disconnected, give 48 hours' notice to the affected occupants of the time and duration of the anticipated shutoff.
   5. Notify Fire Department 48 hours in advance if water main or fire supply line shutoff is required.
   6. Raise, lower, or move underground utilities, utility structures or structures which interfere with the utility or utility structure being constructed as part of this Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:
   1. Approval Required: Material shall be subject to the approval of Engineer or independent testing laboratory.
   2. Notification: For approval of imported material, notify Engineer or independent testing laboratory at least 1 week in advance of intention to import material, designate the proposed borrow area, and permit Engineer or independent testing laboratory to sample as necessary from the borrow area for the purpose of making acceptance tests to prove the quality of the material.

B. Material Sources and Uses:
   1. Imported Material:
      a. Foundation material.
      b. Bedding.
      c. Pea stone.
      d. Trench backfill.
   2. Native material unless quantity is not sufficient; then shall be imported material: Suitable material.

C. Foundation Material for Crushed Stone: 1-1/2-inch maximum size.

D. Bedding:
   1. For Pipes Less Than 36 Inches:
      a. MDOT 902 Granular Material Class II modified to 100% passing a 1/2-inch sieve.
      b. MDOT 902 Coarse Aggregate 17A.

2. For Utility Structures:
   a. Sand gravel fill of such gradation that 100% will pass a 1/2-inch sieve and not more than 10% by weight is lost by washing, or
   b. MDOT 902 Granular Material Class II modified to 100% passing a 1/2-inch sieve.

E. Pea Stone: Clean stone with 100% passing a 3/8-inch sieve and 100% being retained on a No. 8 sieve.

F. Trench Backfill: MDOT 902 Granular Material Class II.

G. Suitable Material:
1. Native Material Which is Used as Backfill:
   a. Exclusive of gray or blue clay, peat, organic matter, or frozen lumps.
   b. Containing no rocks or lumps over 3 inches in greatest dimension.
   c. Having a moisture content such that material is capable of being compacted to 90% maximum density.
2. MDOT 902 Granular Material Class II if native material is not adequate in opinion of Engineer.

2.2 OTHER MATERIALS

A. Other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by Contractor subject to the approval of Engineer or independent testing laboratory.

PART 3 - EXECUTION

3.1 GENERAL

A. Excavating, Backfilling and Compacting:
1. For Utility Structures: In accordance with this Section.

B. Obstructions:
1. Remove and dispose of buried trees, rocks, boulders, driving surfaces, pipes and the like, as required for the performance of the Work.
2. Exercise care in excavating around catch basins, inlets and manholes.
3. Avoid removing or loosening castings.
4. Repair and replace damaged or displaced castings; remove dirt entering utility structures during the performance of the Work at no additional cost to Owner.

C. Cutting Paved Surfaces and Similar Improvements:
1. Cut pavement prior to excavating.
2. Cuts shall be a minimum of 1-foot wider than trench on each side. When the remaining width of paved surface is less than 4 feet, remove the entire paved surface.
3. Before removing pavement, mark the pavement neatly, paralleling pipe lines and existing street lines. Space the marks the width of the trench.
4. Concrete:
   a. Pavements: Saw cut if over 3 feet from expansion or construction joint, otherwise remove to joint.
   b. Sidewalks: Remove to joints.
   c. Curb and Gutter: Remove to joints.
5. Final Surface Course Bituminous: Saw cut joints unless otherwise approved by Engineer.
6. Do not disturb or damage the adjacent pavement. If the adjacent pavement is disturbed or damaged, remove and replace the damaged pavement.
7. Contractor may tunnel under curbs that are encountered. Replace curb disturbed by construction.
8. Dispose of materials removed.

3.2 EXCAVATION AND TRENCHING

A. General:
1. By open cut from surface unless designated otherwise.
2. Slope sides of trench adequately for protection of the Work and safety of workers.

B. Maximum Length of Open Trench: 200 feet.

C. Width:
1. Minimum Clearance on Each Side of Utility:
   a. To 16 Inches Diameter: 8 inches.
   b. Greater Than 16 Inches Diameter: Pipe outside diameter times 1.25 plus 12 inches.
2. Maximum Width of Trench at Top of Bedding:
   a. Up Through 30-Inch Diameter Utility: 16 inches plus utility diameter.
   b. Greater Than 30-Inch Diameter Utility: 24 inches plus utility diameter.
3. Maximum Width of Trench at Ground Surface:
   a. Not outside of the property line or easement.
   b. As required for protection of the Work and safety of workers.
   c. Use sheeting, bracing and shoring if required.
4. Provide sufficient space in the trench to permit the joint to be properly made.

D. Depth:
1. Excavate to provide the elevations, grades, and depths of cover indicated on the Drawings and herein specified.
2. The 4 inches of required bedding material below the utility may be omitted if:
   a. Approved by Engineer.
   b. Contractor arranges and pays for testing of the native material.
   c. The native material complies with MDOT 902 Granular Material Class II material, modified so that 100% passes a 1/2-inch sieve.
   d. The material is compacted as specified herein.
3. Excavate to the normal trench bottom elevation with an accuracy of ± 0.10 feet.

E. Bedding:
1. Place the bedding material up to 1/8 the height of the utility. Compact as herein specified.
2. Accurately shape the bedding material to fit the pipe shape. Recess the bedding to relieve the pressure on the bell or other projecting utility joint.
3. After laying out the utility, tamp additional bedding in place up to the midpoint of the utility. Use hand-operated compactors to achieve the required compaction.
4. Place additional bedding up to 12 inches above the top of the utility. Use hand operated compactors to achieve required compaction.
5. Place bedding in maximum lifts of 10 inches.
6. No payment shall be made for aggregate or stone bedding when used for Contractor convenience.

F. Trench Backfill:
1. Use backfill material as each Drawing detail indicates and as the material is defined herein.
2. Place backfill in 12-inch lifts and compact as herein specified. Engineer will consider greater lifts if testing indicates that the required compaction is being achieved.

G. Utility Structures:
1. Place and compact specified bedding below utility structures.
2. Backfill around utility structures shall be of the same type backfill as that required for the trench in accordance with these Contract Documents.
3. Place backfill in 12-inch lifts and compact as herein specified.

3.3 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. General: Contractor responsibility and expense.

B. Disposal Sites:
1. Material desired by Owner shall be disposed of by Contractor in the following priority order:
   a. At locations designated by the Contract Documents.
   b. At locations on or within 2 miles of the Project Site designated by Owner after construction starts.
   c. At locations on the Project Site by written arrangement with individual property owners.
   d. Owner may choose not to accept certain materials, including but not necessarily limited to, items from clearing, muck, peat, marl and whole or broken man-made items removed by construction.
2. Material not desired by Owner shall be disposed of in a location determined by Contractor.

3. Disposal of materials shall not violate laws, rules, regulations and the like regarding the filling of flood plains, wetlands and other environmentally sensitive areas.
4. Provide adequate controls to maintain disposal sites in a neat and safe condition by periodic leveling of material, and such other practices as are necessary.
5. Provide soil erosion control measures necessary to prevent soil erosion and sedimentation of wetlands, rivers, ditches, or similar low lying areas.

3.4 EXCESS WATER CONTROL

A. Regulations and Permits: Comply with soil erosion control permit in accordance with Mich. P.A. 451, Part 91 of 1994, the Natural Resource and Environmental Protection Act, and all pertinent rules, laws, and regulations.

B. Unfavorable Weather:
1. Do not place, spread or roll fill material during unfavorable weather conditions.
2. Do not resume operations until moisture content and fill density are satisfactory to Engineer or independent testing laboratory.

C. Pumping and Drainage:
1. Provide, maintain and use at all times during construction adequate means and devices to promptly remove and dispose of water from every source entering the excavations or other parts of the Work.
2. Dewater by means which will ensure dry excavations, preserve final lines and grades, and do not disturb or displace adjacent soil. Use wells, portable pumps, temporary underdrains, or other methods as necessary.
3. Perform Pumping and Drainage:
   a. In such a manner to cause no damage to property or structures and without interference to the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors.
   b. In accordance with pertinent laws, rules, ordinances, and regulations.
4. Do not overload or obstruct existing drainage facilities.

D. General:
1. Keep excavations dry during construction.
2. Remove water by use of wells, well points, portable pumps, bailing, drains, underdrains or other acceptable methods.
3. Provide crushed stone or gravel as required to aid dewatering operations.
4. Divert or temporarily reroute existing sewers and drainage of discharge lines to adequate and acceptable outlets during construction. Contractor responsible to ascertain availability of outlets.
5. Divert surface water from entering excavations by construction and maintenance of channels or berms.
6. Sediment traps and other soil erosion control measures shall prevent soil particles from entering any sewer, watercourse or similar conveyance.
7. Protect utilities, utility structures, and structures, existing and new, from hydrostatic uplift.

3.5 SHEETING, SHORING AND BRACING EXCAVATIONS

A. General:
1. Furnish, put in place and maintain sheeting, bracing and shoring as may be required to properly support the sides of excavations and to prevent movement of earth which could in any way injure the Work or adjacent property.
2. Exercise care in the removal of sheeting, shoring, bracing and timbering to prevent collapse or caving of the excavation faces being supported and damage to the Work and adjacent property.
3. A pipe-laying box may be used in lieu of sheeting.

B. Sheeting:
1. Do not install by jetting.
2. Remove as backfilling proceeds, unless ordered left in place by Engineer. Use care to fill and compact voids created by removal, especially below mid-height of utility.
3. Sheeting Left in Place:
   a. Requires written approval of Engineer.
   b. Cut off minimum of 2 feet below finished grade.

3.6 CLEANUP

A. Upon completion of the work of this Section, remove all excess excavated material, trash, and debris resulting from construction operations. Remove equipment and tools. Leave the Site in a neat and orderly condition acceptable to Engineer, and in accordance with Division 01 Section “Cleaning and Waste Management.”

END OF SECTION 31 23 03

SECTION 31 25 00 – EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing, installation and maintenance of soil erosion and sedimentation control (SESC) measures.
   1. Minimum SESC measures/Best Management Practices (BMP) are indicated on the Drawings. These measures are to be installed correctly before any grading or excavating begins on the Site. Contractor should add additional BMP's as required by their operations, such as temporary stock piles, equipment storage etc.
   2. Stage Construction and stabilization activities to minimize the amount of disturbed area at any one time.
   3. Remove sediment caused by erosion from storm water before it leaves the Site or enters waters of the state.
   4. Place soil piles away from drainage courses. Soil piles must be protected from precipitation and wind with non-erosive covers or other BMP's.
   5. Provide anti-tracking areas for haul roads and equipment. Sweep streets, parking areas regularly as needed.
   6. Dust control must be implemented on all sites exposed to wind erosion.
   7. Keep copies of permits and inspections on Site at all times.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. Soil erosion and sedimentation control rules and guidelines of:
      a. State of Michigan R323.2190 National Permit for stormwater discharge from Construction (Michigan's "Permit by Rule").
      b. Michigan Natural Resources and Environmental Protection Act, Part 31 of Act 451 of 1994 Soil Erosion and Sedimentation Control (Water Resources Protection Act).
      c. Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environmental Protection Act (Soil Erosion and Sedimentation Control (SESC).
      d. EGLE Nonpoint Source Best Management Practices Manual.
      e. City of Ann Arbor City Code Chapter 55.
      f. Michigan Department of Transportation SESC Design Manual.
   2. ASTM Standards:
      a. A974 – Standard Specification for Welded Wire Fabric Gabions and Gabion Mattresses (Metallic-Coated or Polyvinyl Chloride (PVC) Coated).
      b. C33/C33M – Standard Specification for Concrete Aggregates.
      c. D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
      d. D4751 -Standard Test Method for Determining Apparent Opening Size of a Geotextile.
      e. D4992 – Standard Practice for Evaluation of Rock to be Used for Erosion Control.
      f. D5313 – Standard Test Method for the Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions.
      g. D6092 – Standard Practice for Specifying Standard Sizes of Stone For Erosion Control.
      h. D6459 – Standard Test Method for Determination of Erosion Control Blanket (ECB) Performance in Protecting Hillslopes from Rainfall-Induced Erosion.
      i. D6461, D6462 – Standard Practice for Silt Fence Materials and Installation.
      j. D6599 – Practice for Construction of Live Fascines on Slopes.
      k. D6711 – Practice for Specifying Rock to Fill gabions, Revet Mattresses, and gabion Mattresses.

1.4 SUBMITTAL

A. Action Submittals (Manufacturers information):
   1. Geotextile fabric.
   2. Stabilized Construction Entrance
   3. Silt Fence.
   4. Inlet Protection.
   5. Seed mixtures.
   6. Tacking Agents.
   7. Fertilizer.
   8. Turbidity curtain.

B. Informational Submittals:
   1. Name and certification number of certified storm water operator that will be responsible for Site inspections.
   2. Sequence of Construction in sufficient detail as requested by Engineer.

1.5 QUALITY ASSURANCE

A. Performance Standard:
   1. Compliance with the Soil Erosion Control Permit (Part 91) and the Michigan Permit by Rule. The SESC measures indicated on the Drawings and specified here in are a minimum requirement. If more SESC measures are required to comply with the permit, notify the Engineer responsible for preparation of the SESC plan for plan amendment. Additional SESC measures required due to the Contractor's operations will not be considered for additional payment.

B. SESC Preconstruction Meeting:
   1. Conduct a field evaluation of the Site with the Engineer, Certified Storm Water Operator, the Local Enforcing Agent, and the Contractor's Superintendent after all initial SESC measures are installed and prior to any clearing, grading or excavation work.
   2. This meeting shall be scheduled and organized by the Contractor.
   3. Review the installed SESC measures by walking the Site and confirm compliance to the Permit and the approved SESC Plan.
   4. Review the location for display of the permit.
   5. Review location for SESC inspection log.

C. Stop Work Order:
   1. Owner reserves the right to issue a Stop Work Order if soil erosion and sedimentation controls are not properly installed or maintained.
   2. Work performed under a Stop Work Order will not be considered for payment.
   3. Costs resulting from delay due to issuance of a Stop Work Order shall be the responsibility of Contractor.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers or wrapping as applicable.

B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, damage by weather or elements, and in accordance with manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 SOIL EROSION AND SEDIMENTATION CONTROL MATERIALS

A. Stabilized Construction Entrance:
   1. Stabilize a pad of clean crushed stone located at points where traffic will be accessing a construction site. Minimize construction access points to locations as indicated on the Drawings.

2. Stone Size – Use ASTM C33, size No. 2 (2-1/2-inch to 1-1/2-inch) or 3 (2 inch to 1 inch). Use clean crushed angular stone. Crushed concrete of similar size may be substituted, but will require more frequent upgrading and maintenance.
3. Place on woven geotextile fabric if underlying soils are soft. TerraTex GS, or equal.
4. Thickness: Not less than 6 inches.
5. Width: Not less than full width of points of ingress or egress or a minimum of 20 feet.
6. Length: 50 feet minimum where the soils are course grained (sands or gravels) or 100 feet minimum where soils are fine grained (clays or silts), except where the traveled length is less than 50-feet or 100 feet respectively. These lengths may be increased where field conditions dictate. Stormwater from up-slope areas shall be diverted away from the stabilized pad where the slope of the access road exceeds 5%, a stabilized base of Hot Mix Asphalt Base Course.

B. Temporary Vegetation:

Seed Type	Lower Peninsula (south of US10)*	Lower Peninsula (north of US10)*	Upper Peninsula*	Seeding Rate
Oats, Barley	4/1 to 9/15	4/15 to 8/1	5/1 to 8/1	2 lbs/1,000 sft
Annual Rye	8/1 to 10/15	8/1 to 10/10	8/1 to 11/1	3 lbs/1,000 sft
Wheat	9/20 to 10/15	9/10 to 10/10	9/10 to 10/1	3 lbs/1,000 sft
Buckwheat	6/1 to 7/15	6/1 to 7/15	6/15 to 7/15	2 lbs/1,000 sft
Perennial Ryegrass	8/1 to 10/15	8/1 to 10/1	8/1 to 10/1	1 lbs/1,000 sft
*Seasonal Limitation Dates				

C. Permanent Vegetative Cover:
1. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and mulch anchoring.
2. Immediately prior to seeding and topsoil application, the subsoil shall be evaluated for compaction.
3. Topsoil should be handled only when it is dry enough to work without damaging the soil structure. A uniform application to a depth of 4 inches (unsettled) is required on all sites. Topsoil shall be amended with organic matter, as needed, in accordance with the Standard for Topsoiling.
4. See Division 32 Section “Turf and Grasses” for Seasonal requirements.

D. Riprap:
1. Stone for riprap shall consist of natural field stone or crushed quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5.
2. Recycled rubble concrete may not be used.
3. The riprap shall be composed of a well-graded mixture such that 50% of the mixture by weight shall be larger than the d50 size as determined from the design procedure. A well-graded mixture as used herein is defined as a mixture composed primarily of the larger stone sizes, but with a sufficient mixture of other sizes to fill the progressively smaller voids between the stones. The diameter of the largest stone size in such a mixture shall be 1.5 times the d50 size. The d75 should be 1.25 times the d50 and the d15 should be 0.5 times the d50 size.

E. Geotextile Fabric for Riprap:
1. Synthetic Industries, Terra Tex HD, or equal.
2. Woven, high strength polypropylene.
3. Grab Tensile Strength: 315 pounds (min) in accordance with ASTM D4632 (min).
4. Apparent Opening Size: 40 US sieve (max) in accordance with ASTM D4751 (max).
5. Water Flow Rate: 4 gpm/sft (min) in accordance with ASTM D4491 (min).

F. Geotextile Silt Fence:
1. Synthetic Industries, Terra Tex SF-90, or equal.
2. Woven, high strength polypropylene.
3. Grab Tensile Strength: 100/100 lbs (min) in accordance with ASTM D4632 (min).
4. Apparent Opening Size (AOS): 20-50 US sieve (max) in accordance with ASTM D4751 (max).
5. Water Flow Rate: 8 gpm/sft (min) in accordance with ASTM D4491 (min).
6. Wood Stakes, Hardwood: 1.5-inch x 1.5-inch x 48-inch (min), 6 foot spacing (max) with 3/8-inch-thick lath fastening bar.

G. Silt Guard:
   1. Above Ground Filters:
      a. Frame and Filter Assembly: Silt Saver, Inc.; or equal.
      b. Nonwoven polypropylene filter with needle punched holes.
      c. High density polyethylene frame.
      d. 60-inch frame, high flow filter.
      e. Filter Material: 120 gpm/sft (min).
      f. Apparent Opening Size (AOS): 40 US Std. Sieve.
      g. Tensile Strength (ASTM D4632): 410/300 (min).
   2. Inlet Protection (Catch Basins):
      a. Siltsak by ACF Environmental; Inlet Pro Sediment Bag High Flow by Hanes Geo Components; DANDY BAG by Dandy Products Inc.; or equal.
      b. Geotextile fabric silt sump.
      c. Grab tensile strength: 281x170 pounds in accordance with ASTM D4632 (min).
      d. 38 gallons per minute per square foot (GPM/SF), water flow rate in accordance with ASTM D4491 (min).
      e. Apparent Opening Size (AOS): 40 US Sieve.
      f. Manufactured to meet size of inlet.

H. Turbidity Curtain:
   1. Polyethylene Plastic Sheet: 10 mil. 18oz/yd2 minimum, yellow color, or suitable alternate. Place 5-pound weights at 10-foot intervals along the entire length. Place floats at 5-foot intervals; 2 floats at each location, one on either side of the material.
   2. Top rope to be 1/4-inch nylon or manila.
   3. Set barrier on a 50-foot radius from the point of discharge when discharging through a conduit.
   4. Barrier to extend parallel to the channel bank(s) for the full length of the work area for shoreline disturbances.
   5. Dielectrically welded or double-sewn seams upper hem of sufficient strength to contain flotation material.
   6. Flotation material to be expanded polystyrene of sufficient diameter to support curtain at or above the water level.
   7. Dielectrically welded or double-sewn seams lower hem of sufficient strength to enclose lower ballast.
   8. Lower ballast to be galvanized steel chain of sufficient strength and weight to hold curtain in vertical position.
   9. Curtain to be tied to concrete anchors at both ends, top and bottom, to prevent moving.

PART 3 - EXECUTION

3.1 GENERAL

A. Standards:
   1. Achieve Effective Erosion Control to prevent erosion of Site slopes and ditches.
   2. Achieve effective control of sedimentation to prevent any offsite discharge or tracking of Site soils.
   3. Maintain soil erosion and sedimentation controls until the Site is stable. Definition of stable site is final concrete and/or asphalt paving is complete, and all turf areas have 80% growth.
   4. Do not remove temporary soil erosion and sedimentation control measures until Site is determined to be stable by the Engineer.
   5. Sweep streets weekly, or more frequently if required, or directed by Engineer.

3.2 DUST CONTROL

A. Prevent blowing and movement of dust from exposed soil surfaces, prevent on Site and off Site damage and health hazards and improve traffic safety:
   1. The following methods should be considered for controlling dust.
      a. Mulches.
      b. Temporary Vegetative Cover.

3.3 CONSTRUCTION ENTRANCE DRIVE

A. Employ water truck and street sweeper as necessary to keep sediment off of on Site and off Site roadways. The entrance must be maintained in a condition which will prevent tracking or flowing of sediment onto roadways. This may require periodic top dressing with additional stone or additional length as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed, or tracked onto roadways (public or private) or other impervious surfaces must be removed immediately.

B. Where accumulation of sediment is inadequately cleaned or removed by conventional methods, a power broom or street sweeper will be required to clean paved or impervious surfaces. All other access points which are not stabilized must be blocked off.

3.4 INLET PROTECTION

A. Install on existing inlets prior to any grading or excavation. Install on new inlets as soon after installation as practical.

B. Inspect frequently, especially after any rain event. Maintain repair, and replace promptly, as needed.

C. Remove barrier only when the area draining toward the inlet has been stabilized.

3.5 SOIL ROUGHENING

A. On all slopes 1:3 or steeper, grade the slope with a dozer taking a vertical path so that the track marks on the slope create a horizontal roughened grooved condition to help prevent erosion of the slope.

3.6 TEMPORARY VEGETATIVE COVER

A. General:
   1. Provide temporary seed if permanent measures will not be placed within 15 days of initial disturbance and area will not undergo further earth change within 15 days of initial disturbance.
   2. Seed: Apply uniformly at a minimum rate of 3 to 5 pounds per 1,000 square feet.
   3. Mulch:
      a. Mulching is required on all seeding. Mulch will protect against erosion before grass is established and will promote faster and earlier establishment. The existence of vegetation sufficient to control soil erosion must be deemed compliance with this mulching requirement.
      b. Straw: Unrotted small grain straw, free of seeds
      c. Application: Spread mulch uniformly by hand or mechanically so that at least 85% of the soil surface is covered. For uniform distribution of hand-spread mulch 75 to 100 pounds per 1,000 square feet. Anchoring must be accomplished immediately after placement to minimize loss by wind or water. This may be done by one of the following methods, depending upon the size of the area, steepness of slopes.
         1) Peg and Twine. Drive 8-to-10-inch wooden pegs to within 2 to 3 inches of the soil surface every 4 feet in all directions. Stakes may be driven before or after applying mulch. Secure mulch to soil surface by stretching twine between pegs in a crisscross and a square pattern. Secure twine around each peg with two or more round turns.
         2) Mulch Nettings: Staple paper, jute, cotton, or plastic nettings to the soil surface. Use a degradable netting in areas to be mowed.
         3) Crimper (mulch anchoring coulter tool): A tractor-drawn implement, somewhat like a disc harrow, especially designed to push or cut some of the broadcast long fiber mulch 3 to 4 inches into the soil so as to anchor it and leave part standing upright. Straw mulch rate must be 3 tons per acre. No tackifying or adhesive agent is required.
         4) Liquid Mulch-Binders (May be used to anchor straw mulch):
            a) Applications should be heavier at edges where wind may catch the mulch, in valleys, and at crests of banks. The remainder of the area should be uniform in appearance.

b) Organic and Vegetable Based Binders: Naturally occurring, powder-based, hydrophilic materials when mixed with water formulates a gel and when applied to mulch under satisfactory curing conditions will form membraned networks of insoluble polymers. The vegetable gel must be physiologically harmless and not result in a phytotoxic effect or impede growth of turf grass. Use at rates and weather conditions as recommended by the manufacturer to anchor mulch materials.

3.7 PERMANENT VEGETATIVE COVER

A. General:
1. Seed all disturbed areas within 5 days of final grading.
2. Apply uniformly at a minimum rate of 3 to 5 pounds per 1,000 square feet.
3. Mulch as indicated on the Drawings or as needed to effectively control soil erosion.

3.8 GEOTEXTILE SILT FENCE

A. Space posts 6 feet center-to-center or closer. Extend at least 12-inches into the ground. Posts shall be constructed of hardwood with a minimum diameter thickness of 1-1/2 inches.

B. Wire Backed silt fence: A metal fence with 6 inch or smaller wire mesh openings and at least 2 feet high may be utilized, fastened to the fence posts, to provide reinforcement and support to the geotextile fabric. Place posts 6 feet on center.

C. Bury geotextile fabric at least 6 inches deep in the ground. Extend The fabric at least 2 feet above the ground. The fabric must be securely fastened to the posts using a system consisting of metal fasteners (nails or staples) and a high strength reinforcement material (nylon webbing, grommets, washers, etc.) placed between the fastener and the geotextile fabric. The fastening system must resist tearing away from the post. Install silt fence in accordance with manufacturer's instructions, and Project Drawing detail sheets.

D. Location: Where indicated on the Drawings or as needed to prevent offsite movement of soil.

3.9 RIPRAP

A. Place no bends or curves at the intersection of the conduit and apron or scour hole will be permitted.

B. There must be no over fall from the end of the apron to the receiving channel.

3.10 TURBIDITY CURTAIN

A. Install turbidity curtain in accordance with manufacturer's instructions.

B. Location: As required by the Contractor's operations to prevent sediment from migrating more than 30 feet from the point of excavation.

3.11 BUILDING PROJECT CONSTRUCTION

A. During construction conform to the following general rules:
1. Minimize the amount of earth disturbed at any one time.
2. Establish a construction sequence which includes adequate erosion control.
3. As much as practical, direct stormwater away from the construction area. Direct diverted stormwater to a stable on-Site area.
4. Collect runoff from the Site in sediment basins, traps or through filters.
5. Establish an inspection and maintenance schedule, paying special attention to the beginning of the various stages of construction.

3.12 AIRBORNE SEDIMENT

A. Dust Control:
   1. Use legal means necessary to control dust on and near the Work and on and near off Site borrow areas if such dust is caused by Contractor's operations during performance of the Work or if resulting from the condition of the Site when earthwork operations are suspended.
   2. Treat haul roads, delivery roads, temporary Site access roads and other surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the Site, and as directed by Engineer.
   3. Periodically scrape and broom adjacent streets and paved areas to remove tracked dirt.

B. Wind Erosion:
   1. Erect and maintain barriers to prevent migration of windblown sediment offsite.
   2. Conduct operations in such a manner as to minimize the amount of Site area exposed to wind erosion.
   3. Be responsible for removal of windblown sediments deposited off Site, including costs for cleaning or repairs required due to sediment deposition and removal.

END OF SECTION 31 25 00

SECTION 32 31 13 – CHAIN LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of chain link fences and gates.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. ASTM:
      a. A90 - Test Method for Weight of Coating of Zinc-Coated (Galvanized) Iron and Steel Articles.
      b. A121 - Zinc-Coated (Galvanized) Steel Barbed Wire.
      c. A392 - Zinc-Coated Steel Chain-Link Fence Fabric.
      d. A491 - Aluminum-Coated Steel Chain-Link Fence Fabric.
      e. A585 - Aluminum Coated Barbed Wire.
      f. B545 - Electro-deposited Coatings of Tin.
      g. C1107 - Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
      h. F567 - Installation of Chain-Link Fence.
      i. F626 - Fence Fittings.
      j. F900 - Industrial and Commercial Swing Gates.
      k. F1043 - Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
      l. F1083 - Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
      m. F1183 - Aluminum Alloy Chain Link Fence Frame Fabric.
      n. F1184 - Industrial and Commercial Horizontal Slide Gates.
   2. Institute of Electrical and Electronic Engineers: IEEE C2 - National Electrical Safety Code.
   3. National Fire Protection Association: NFPA 780 - Installation of Lightning Protection System.
   4. Underwriters Laboratories: UL 467 - Safety Grounding and Bonding Equipment.

1.4 DEFINITIONS

A. Corner Posts: Posts located at a change in horizontal alignment.

B. End Posts: Posts located at the beginning or end of a length of fence.

C. Gateposts: Posts which support the weight of a gate. Gateposts may function also as terminal posts but generally are sized differently.

D. Line Posts: Posts between terminal posts.

E. Pull Posts: Posts located within a length of fence at certain distances, and at changes in vertical alignment, to facilitate stretching of fabric.

F. Terminal Posts: Posts set where fence fabric terminates, and between which the fabric is stretched; a term which includes end, corner, and pull posts.

1.5 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings: For fence.
      a. Dimensions.
      b. Anchorage details.
   2. Product Data: For fence, post and gate.
      a. Catalog cuts.
      b. Coating data and coating choices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products of the following Manufacturers, provided they comply with requirements of the Contract Documents, will be among those considered acceptable:
   1. Allied Tube and Conduit Corporation; Harvey, IL 60426.
   2. Anchor Fence, Inc.; Baltimore, MD 21224.
   3. Boundary Fence and Railing Systems, Inc.; Richmond, NY 11418.
   4. Merchant Metals, New Paris, IN 46553.

2.2 COMPONENTS

A. Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F1083.

B. Fittings:
   1. Material and finish of accessories shall comply with ASTM F626 and shall match fence fabric.
   2. Zinc coating of ferrous accessories: Hot-dip zinc-coated; weight of coating, 1.8 ounces per square foot of coated area, average unless noted otherwise.
   3. Caps:
      a. Formed steel, malleable or cast iron, or aluminum alloy, with ring to receive top rail or loop to receive tension wire according to fence configuration.
      b. Snug-fitting, weathertight closure of posts.
   4. Rail Ends: Formed steel, malleable or cast iron, or aluminum alloy.
   5. Rail Sleeves:
      a. Formed of same material as rail.
      b. Minimum Length: 6 inches.
      c. Rails with 3-inch swaged ends will not require rail sleeves.
   6. Wire Ties and Clips:
      a. Size: Not less than fabric wire gage size.
      b. Minimum Zinc Coating Weight: 0.8 ounce per square foot.
   7. Brace Bands and Tension Bands: 3/4-inch x 1/10-inch thick (nominal).
   8. Tension Bars:
      a. 3/4 x 3/16-inch (or equivalent section) for 2-inch mesh.
      b. Continuous length to match fabric width.
   9. Tension Wire: 7 gage, aluminum coated steel wire, 0.40 ounces per square foot minimum.
   10. Truss Rods: 5/16-inch minimum diameter rod with turnbuckle.
   11. Fitting for Mechanical Anchorage of Posts: Provide suitable fittings such as base plates, clamps, standoffs, for mechanical anchorage of posts to horizontal, vertical, or inclined surfaces where indicated.

C. Barbed Wire:
   1. Two-strand, 12-1/2 gage twisted steel wire with 4-point barbs spaced at no more than 5 inches on center.
   2. Aluminum coated.
   3. In accordance with ASTM A585.

D. Barbed Wire Support Arms:
   1. Manufacturer's standard article, either attached to posts or integral with post caps.
   2. Single 45-degree arm for 3 strands barbed wire, one for each post.
   3. Molded plastic will not be accepted.
   4. Capable of withstanding 250-pound load applied perpendicular to arm tip.

5. Securely anchored to posts.
6. Fitted with clips or slots for attaching barbed wire.
7. One arm per post with hole for passage of top rail.
8. Same finish as post caps.
9. With lockwire to resist removal of barbed wire.

E. Industrial Horizontal, Cantilevered Slide Gates:
1. General: Comply With ASTM F1184 for the Following Gate Types:
   a. Single gate, heavy duty design.
   b. Classification: Type II cantilever slide, Class I with external roller assemblies.
   c. Fabric and Framing Finish: To match fence.
2. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F1083 and ASTM F1043 for materials and protective coatings.
3. Frames and Bracing: Fabricate from round or square tubing with outside dimension and weight according to ASTM F1184 for the following gate characteristics:
   a. Gate Fabric Height: Over 6 feet.
4. Frame corner construction for Type II cantilever slide gates: Welded.
5. Gate Posts: Fabricate members from round galvanized steel pipe with outside dimension and minimum weight according to ASTM F1184 for the following gate characteristics:
   a. Type II gate opening width: Over 12 feet but not over 30 feet.
6. Guide Posts and Roller Guards: As required in accordance with ASTM F1184 for Type II, Class I gates.

2.3 FABRICATION

A. Fence Configuration:
1. Construct Fence With:
   a. Top rail.
   b. Bottom tension wire.
   c. Bottom of fence fabric 2 inches above grade.
   d. Barbed wire top, 3 strands, inclined outward arm.

B. Fabric:
1. Material:
   a. Steel, zinc-coated before weaving.
   b. In accordance with ASTM A392.
   c. Zinc-coating weight: Class 2, 2.0 ounces per square foot.
   d. Contractor to verify fabric coating and color and matching existing.
2. Selvage:
   a. Fabric 60 Inches High and Under: Knuckled top and bottom.
   b. Fabric 72 inches High and Over:
      1) Twisted top and knuckled bottom.

C. Fence Framework:
1. Coating of Steel Pipe:
   a. Interior and Exterior: Hot-dip zinc-coated.
   b. Weight of Coating: 1.8 ounces per square foot of coated area, average.
   c. Tested in accordance with ASTM A90.
2. Coating of Steel Shapes:
   a. Hot-dip zinc-coated.
   b. Weight of Coating: 1.8 ounces per square foot.
   c. Tested in accordance with ASTM A90.
3. Top Rail Length: 18-foot minimum lengths.
4. Light Industrial Category, Group IA:
   a. Conform to ASTM F1043.
      1) Rail Size: 1.660 inches outside diameter x 0.112-inch wall thickness, 1.82 pounds per foot.
      2) Line Posts Size: 2.375 inches outside diameter x 0.123-inch wall thickness, 2.96 pounds per foot.
      3) Terminal Posts Size: 2.875 inches outside diameter x 0.162-inch wall thickness, 4.69 pounds per foot.

D. Gates:
   1. Gateposts:
      a. Steel pipe, coated as specified for fence framework.
      b. Leafs 6'-0" Wide or Less: 2.875 inches outside diameter x 0.203-inch wall thickness, 5.79 pounds per foot.
      c. Leafs Over 6'-0" Up To and Including 13'-0" Wide: 4 inches outside diameter x 0.226-inch wall thickness, 9.11 pounds per foot.
      d. Leafs Over 13'-0" Up To and Including 18'-0" Wide: 6.625 inches outside diameter x 0.280-inch wall thickness, 18.97 pounds per foot.
      e. Leafs Over 18'-0" Wide: 8.625 inches outside diameter x 0.322-inch wall thickness, 28.55 pounds per foot.
   2. Sliding/Rolling Single Leaf Gates:
      a. According to Manufacturer's standard heavy-duty design.
      b. Fabric: To match line fence.
      c. Framing Finish: To match line fence.
      d. Barbed Wire: 3 strands secured to 1-foot extensions of gate frame.

2.4 FENCE GROUNDING

A. Conductors:
   1. Bare, solid wire for No. 6 AWG and smaller.
   2. Stranded wire for No. 4 AWG and larger.
   3. Use aluminum material above finished grade.
   4. Use copper material on or below finished grade.
   5. Use braided copper tape for bonding jumpers, 1-inch wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

B. Connectors and Ground Rods:
   1. Listed in UL 467.
   2. Connectors for use below grade shall be exothermic welded type.
   3. Ground rods shall be copper clad steel, 5/8-inch by 96 inches.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that line of fence has been properly identified.

B. Verify that proper grade has been established.

C. Verify location of underground utilities and structures.

D. Begin fence construction only after adequate clearance on both sides of fence is available.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts.

B. Do not exceed intervals of 500 feet or line of sight between stakes.

C. Indicate locations of utilities, lawn sprinkling system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION

A. Install Chain Link Fence and Gates in Conformance With ASTM F567:
   1. The Shop Drawings reviewed by Engineer.
   2. The Manufacturer's recommendations.
   3. Install fencing on established boundary line inside property line.

B. Posts:
   1. Layout:
      a. Space line posts at equidistant intervals not exceeding 10 feet on center measured parallel to grade.
      b. Locate terminal posts at the beginning and end of each continuous length of fence, at abrupt changes in line or grade, additionally at intervals not to exceed 500 feet, and as otherwise indicated on the Drawings.
      c. Install posts plumb and in proper alignment.
      d. Elevation of fence shall follow ground line unless otherwise indicated on Drawings.
      e. Bottom of fabric shall run at a uniform distance above ground of 2 inches, ±1/2-inch.
   2. Anchorage of Posts in Soil:
      a. Set posts in concrete-filled holes, securely braced in proper position until concrete has cured at least 3 days above 60 degrees F.
      b. Hole shall be free of loose materials when placing concrete.
      c. Hole diameter shall be not less than 4 times largest cross section of post.
      d. Minimum Hole Depth:
         1) Line and Terminal Posts: 36 inches for fence up to 8 feet high.
         2) Gate Posts:
            a) Leafs 6 Feet High or Less: 36 inches for leafs up to 18 feet wide.
            b) Leafs Over 6 Feet High: 36 inches for leafs up to 12 feet wide; 42 inches for leafs over 12 feet to 18 feet wide.
         3) Deeper as required by fence Manufacturer or installer.
      e. Increase hole depth as necessary to provide a least 3 inches of cover under bottom of post. Do not allow posts to contact soil.
      f. Spread waste excavation materials in approved locations, in accordance with Division 31 Section "Grading."
      g. Thoroughly consolidate concrete.
      h. Extend concrete 1-inch above grade, forming a crown to shed water.
      i. Plumb posts to 1/4-inch in 10 feet.
   3. Anchorage of Posts in Rock or Concrete:
      a. Set posts in cored holes with grout conforming to ASTM C1107.
      b. Minimum Hole Diameter: 1/2-inch greater than largest post cross-section.
      c. Minimum Hole Depth: Three times largest cross post cross-section.
      d. Crown grout to shed water.

C. Fence:
   1. Cut fabric to form one continuous piece between terminal posts.
   2. Pull fabric taut and secure to rails and tension wires at 1-foot on both sides of each post and at intervals of 24 inches, maximum, on center.
   3. Attach fabric to security side of fence.
   4. Secure fabric to line posts with tie wires or clips at intervals of 15 inches, maximum, on center.
   5. Secure fabric to terminal posts for the full width of fabric by using stretcher bars and bands or by integrally weaving fabric to fastening loops on posts.
   6. Secure each barbed wire strand to each support arm.

D. Gates:
   1. Install gates in accordance with Manufacturer's instructions, plumb and level to 1/4-inch in 10 feet, and secure.
   2. Gates shall operate freely without binding or dragging and shall be easily operable by hand.
   3. Install ground set items in concrete as recommended by Manufacturer.

3.4 GROUNDING AND BONDING

A. Fence Grounding:
   1. Install at Maximum Intervals of 1500 Feet, Except as Follows:
      a. Install at lesser distance where grounding resistance is high.
      b. Fences within 100 feet of buildings, structures, walkways, and roadways, shall be grounded at maximum intervals of 750 feet.
   2. Ground Fence on Each Side of Gate Openings:
      a. Bond metal gates to gate posts.

b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities.
c. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

B. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at maximum distance of 150 feet on each side of crossing.

C. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

D. Grounding Method:
1. At each grounding location, drive a ground rod vertically until the top is 6 inches below finished grade.
2. Connect rod to fence with No. 6 AWG conductor.
3. Connect conductor to each fence component at the grounding location, including the following:
a. At each barbed wire strand, make grounding connections to barbed wire with wire-to-wire connectors designed for this purpose.
b. At each barbed tape coil, make grounding connection to barbed tape with connectors designed for this purpose.

E. Bonding Method for Swing Gates: Connect bonding jumper between gate post and gate frame.

F. Connections:
1. Make connections so possibility of galvanic action or electrolysis is minimized.
2. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
3. Use electroplated or hot-tin-coated materials in conformance with ASTM B545, with minimum 30 microns Class E coating, to ensure conductivity and to make contact points closer in order of galvanic series.
4. Clean metal at points of contact before making connections.
5. Make aluminum-to-steel connections with stainless steel separators and mechanical clamps.
6. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
7. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

G. Bonding to Lightning Protection System: Where fence terminates at lightning protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor (or lightning protection grounding conductor) complying with NFPA 780.

3.5 ADJUSTING

A. General:
1. Adjust brace rails and tension rods for rigid installation.
2. Tighten hardware, fasteners, and accessories.

END OF SECTION 32 31 13

SECTION 32 92 00 – TURF AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General a Conditions and Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of the major items listed below:
   1. Seed.
   2. Fertilizer.
   3. Mulch.
   4. Sod.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. State DOT Current Standards:
      a. Specifications for Construction.
      b. Standard Plans.

1.4 DEFINITIONS

A. Follow-up Maintenance: Maintenance required when seeding, sodding, or other vegetative practices do not achieve the desired degree of stabilization.

B. Periodic Maintenance: Maintenance performed after the vegetation has been established.

1.5 LOCATION

A. Sodded Areas: As indicated on the Drawings.

B. Seeded Areas: All disturbed areas within the project limits not covered by other surface improvements or features.

C. Mulch Blankets: As indicated on the Drawings.

1.6 SUBMITTALS

A. Action Submittals: Product Data for mulch blanket.

B. Informational Submittals:
   1. Samples: For netting and mulch blanket.
   2. Supplier's certified analysis for each seed and fertilizer mixture required.

1.7 QUALITY ASSURANCE

A. Fabrication and Installation Personnel Qualifications:
   1. Trained and experienced in the fabrication and installation of the materials and equipment.
   2. Knowledgeable of the design and the reviewed Submittals.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers or wrapping as applicable.

B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, and damage by weather or elements, and according to Manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: In accordance with Division 31 Section “Grading.”

B. Fertilizer:
   1. Comply with MDOT 917.10, Class A except as herein specified.
   2. Liquid Fertilizer for Hydroseed: 16-32-4 containing no chlorine.

C. Seed:
   1. Mixture composed of certified seed of the following purity, germination, and proportions by Weight:
      a. WTP Lawn: THM.
      b. Lagoon Site: TMH.
   2. Furnish seed in durable bags, each marked by the supplier of the blended mix with a tag giving name, lot number, net weight of contents, purity, and germination.

D. Mulch:
   1. Small Grain:
      a. Straw.
      b. Hay.
   2. Anchoring Material for Small Grain Mulch:
      a. Netting:
         1) Biodegradable.
         2) Openings not to exceed 1-1/2 inches x 2 inches.
         3) Minimum Roll Width: 35 inches.
         4) Anchoring Staples or Pins: Wood pegs at least 6 inches long. Steel wire not permitted.
   3. Mulch Blankets:
      a. Biodegradable:
         1) Straw: North American Green S-75; or equal.
         2) Coconut: North American Green C-125; or equal.
         3) Straw and Coconut: North American Green SC-150; or equal.
      b. Non Degradable Polyester: North American Green P-300; or equal.
      c. Anchoring Staples or Pins:
         1) Hardwood stakes at least 6 inches long.
         2) North American Green Bio-Stake blanket pins at least 6 inches long.

E. Sod: Comply with MDOT Section 917.13.

PART 3 - EXECUTION

3.1 TOPSOIL

A. In accordance with Division 31 Section “Grading.”

3.2 SEEDBED PREPARATION

A. General:
   1. After the areas to be seeded have been brought to the required grade and properly trimmed, bring soil to a friable condition by disking, harrowing, or otherwise loosening and mixing to a depth of 3 inches to 4 inches. Thoroughly break all lumps and clods.
   2. If the prepared seedbed is not fertilized, satisfactorily seeded, and mulched before the friable condition is lost through compaction or crusting, repeat the seedbed preparation prior to seeding or reseeding.

B. Raking: Rake prepared seedbed before seeding.

3.3 FERTILIZING

A. Dry Fertilizer:
   1. Broadcast on surface as first step in seeding process.
   2. Apply with seeding if drilled.
   3. Work fertilizer into the soil to a depth of 1-inch to 2 inches.
   4. Apply uniformly.
   5. Application Rate: Equivalent to 240 pounds per acre of 12-12-12.

3.4 SEEDING

A. Scheduling:
   1. Within 30 days from the time the area was first disturbed.
   2. Channel Banks: Within 24 hours from the time the area was first disturbed.
   3. Seasonal Limitations:
      a. April 15 through October 10.
      b. Dormant seeding after October 10.

B. Sowing:
   1. Sow the seed following or in conjunction with the fertilizer and while the seed bed is in a friable condition.
   2. Do not sow seeds through mulch.
   3. Application Rate:
      a. WTP Lawn Areas: Sow seed at a minimum rate of 5 pounds per 1,000 square feet.
      b. Lagoon Areas: Sow seed at a minimum rate of 5 pounds per 1,000 square feet.

C. Finishing: Float and lightly compact areas sown by hydro-seeder or the broadcast method to incorporate the seed into the uppermost 1/2-inch of the soil.

D. Method:
   1. Broadcast: Do not seed when wind velocity exceeds 5 miles per hour.
   2. Mechanical drills.

E. Inspection: Areas which are sown by hydro-seeder or the broadcast method shall be visually inspected for uniformity of application; areas in which visual inspection fails to reveal an average of 2 seeds per square inch shall be resown at no additional cost to Owner.

F. Seed on Slopes: Protect seeded slopes against erosion with netting, asphalt emulsion adhesive or other methods acceptable to Engineer.

3.5 MULCHING

A. Small Grain Mulch:
   1. Application:
      a. Immediately after seeding.
      b. Uniform distribution.
      c. Allow sunlight to penetrate mulch.
   2. Application Rate: Two tons per acre (2-1/2 bales per 1000 square feet).

3. Anchoring:
   a. Mulch anchoring tool.
   b. Netting.

B. Mulch Blankets:
1. Netting on top.
2. Fibers in direct contact with soil.
3. Staple in accordance with Manufacturer's guidelines for slope conditions.
4. Direction of Installation:
   a. Direction of flow of water in intermittent and ephemeral drains.
   b. Perpendicular to sideslopes above normal water level in perennial drains.

3.6 SOD BED PREPARATION

A. Make Area to be Sodded:
1. Smooth and uniform.
2. Parallel to the finished grade and cross sections indicated on the Drawings.

3.7 LAYING SOD

A. General:
1. Moisten sod and place on a moist earth bed.
2. Lay sod within 24 hours after cutting and properly protect it until placed.
3. Carefully place the sod by hand in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward.
4. Do not use pitch forks to handle sod. Dumping from vehicles will not be permitted.
5. Extend bottom edge of sodded areas at least 2 inches into the ground or ditch bottom.
6. Break transverse joints of sod strips and carefully lay sod to produce tight joints.
7. When the sod may be displaced during sodding operations, work from ladders or treaded planks.
8. Firmly compact the sod by tamping immediately after it is placed.
9. After tamping, the sod shall present a smooth, even surface free from bumps and depressions.

B. Sod on Slopes:
1. On slopes steeper than 1 vertical to 3 horizontal, peg the sod with wooden pegs.
2. Space pegs not over 2 feet apart in any direction.
3. Drive pegs flush with the surface of the sod.

C. Frozen Materials:
1. Do not place frozen sod.
2. Do not place sod on frozen soil.

D. Watering: After placing sod, water with an initial application of 15 gallons per 100 square feet.

3.8 MAINTENANCE

A. General:
1. Contractor: Responsible for follow-up maintenance.
2. Owner, Contractor is responsible for periodic maintenance for 60 days after completion of areas of seeding or sodding.

B. Follow-up Maintenance:
1. Inspect materials planted in the spring during the summer or early fall, and take corrective action during the fall planting season.
2. Inspect materials planted in the fall during the spring and take corrective action during this spring planting season.
3. Reseed, sod, plant, fertilize, mulch, topsoil, grade and roll as necessary to achieve a uniform lawn free from eroded or bare areas.
4. Water sodded and seeded areas as required to maintain the viability of the Product.

C. Periodic Maintenance:
   1. Mow grass at 3-inch to 3-1/2-inch height and subsequent mowings as required to maintain 1-1/2-inch to 2-inch height.
   2. Spot seed areas damaged by traffic or other means.

END OF SECTION 32 92 00

SECTION 33 90 10 – SITE PROCESS PIPING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the furnishing and installation of site process piping systems.

B. Work Included: All buried site process piping and accessories as indicated on the Drawings and herein specified.

C. Work Not Included:
   1. The work not covered under this Section includes nonburied process piping.
   2. The work does not include natural gas piping, building waste, vent and drainage systems, and piping systems to support HVAC systems.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. ASTM Standards:
      a. C270 - Mortar for Unit Masonry.
      b. C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
      c. C478 - Precast Concrete Manhole Sections.
      d. C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
   2. AWWA Standards:
      a. C105 - Standard for Polyethylene Encasement for Ductile-iron Piping for Water and Other Liquids.
      b. C110 - Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In., for Water and Other Liquids.
      c. C115 - Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
      d. C151 - Standard for Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
      e. C 517 - Resilient-Seater Cast-iron Eccentric Plug Valves.
      f. C 550 - Protective Epoxy Interior Coatings for Valves and Hydrants.
      g. C504 - Standard for Rubber-Seated Butterfly Valves for Water and Sewerage Systems.

1.4 SUBMITTALS

A. Shop Drawings: For site process piping systems.
   1. Outline, cross-sections, assembly drawings, dimensions and engineering data.
   2. Inside lining and outside coating.
   3. Name of Manufacturer and model.
   4. Materials of construction.

B. Manufacturer’s Literature: Submit complete Manufacturer's installation instructions for all Products.

C. Operation and Maintenance Manuals: For valves and operators. Outline, cross-sections, assembly drawings, and engineering data.

D. Submit Manufacturer's certification that products and materials comply with these Specifications.

1.5 QUALITY ASSURANCE

A. Fabrication and Installation Personnel Qualifications:
   1. Trained and experienced in the fabrication and installation of the materials and equipment.
   2. Knowledgeable of the design and the reviewed Shop Drawings.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers.

B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter. damage by weather or elements, and in accordance with Manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

D. Ship and handle valves in conformance with Appendix B of AWWA C 504.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Ductile Iron Pipe (DIP):
   1. Pipe: AWWA C151.
   2. Joints:
      a. Mechanical Joint: AWWA C111 with ductile iron retainer glands.
      b. Push-On Joint: AWWA C111.
      c. Restrained Mechanical Joint:
         1) U.S. Pipe: MJ Gripper Gland.
         2) American: Lok-Fast.
         3) Ebaa Iron Sales, Inc.: Megalug retainer gland.
      d. Restrained Push-On Joint:
         1) U.S. Pipe: TR FLEX, TR FLEX GRIPPER ring.
         2) American: Flex-Ring, Lok-Ring.
         3) Clow: Super-Lock.
   3. Fittings:
      a. Ductile iron 150 psi minimum.
      b. Fittings:
         1) AWWA C110 or C153.
         2) Fittings not covered by AWWA C110 or C153:
            a) Laying Dimensions: ANSI B16.1 Class 125; Manufacturer's standard for fittings not covered by ANSI B16.1.
            b) Thickness Design and Pressure Rating: AWWA C110 or C153.
   4. Lining: AWWA C104, cement-mortar, standard thickness, pipe and fittings.
   5. Outside Coating: Asphaltic coating, pipe and fittings.
   6. Thickness Class: Class 50.
   7. Polyethylene Encasement: In accordance with AWWA C105.
   8. Gaskets: SBR.

2.2 VALVES

A. Plug Valves:
   1. Conform with the latest edition of AWWA C517 - Resilient-Seated Cast-Iron Eccentric Plug Valves.
   2. Eccentric Plug: Stem axis slightly offset from valve centerline. Open counter clockwise.
   3. Non-lubricated type.
   4. Pressure Rating: 150 psi or greater.
   5. Port Area:
      a. Valves 20 inches and Smaller: Minimum 80% of the full pipe area.
      b. Valves Greater Than 20 inches: Port area equal or exceed 100% of the full pipe area.

6. End Connections:
   a. Flanged: ANSI B16.1 Class 125, including facing drilling and thickness.
7. Materials of Construction:
   a. Body and Plug: Cast Iron or ductile iron.
   b. Resilient seat seal.
   c. Body Seat: Greater than 95% nickel alloy, or 316 stainless steel.
   d. Elastomer: Buna-N, Neoprene, or EPDM.
   e. Exterior Fasteners: Zinc plated.
8. Coating:
   a. Interior surfaces and exterior immersed surfaces: Coat in accordance with AWWA C550 using an epoxy; Tnemec; or equal.
   b. Exterior Surfaces (non-immersed): Shop prime coat in accordance with Division 09 Section "Painting" for interior ferrous metals – non-immersed (epoxy system).
   c. Flange Faces: In accordance with AWWA C504.
9. Actuator: 2-inch operating nut.
10. Manufacturers:
    a. DeZurik.
    b. Henry Pratt Company.
    c. Val-Matic.

2.3 VALVE BOXES

A. Valves 16-Inch Diameter and Smaller:
   1. Style: Buffalo style, 5-1/4-inch shaft, 3-section, designed to cover valve completely.
   2. Materials of Construction: Cast iron.
   3. Height Adjustment: Screw type.
   4. Cover: Nonlocking.
   5. Base Section:
      a. No. 4 Round Base: Valves 4-inches and smaller.
      b. No. 6 Round Base: Valves 8-inches and smaller.
      c. No. 8 Round Base: Valves 12-inches and smaller.
      d. No. 160 Oval Base: Valves 16-inches and smaller.

B. Lid Marking:
   1. Potable Water Lines: "WATER."
   2. Wastewater Sludge and Drain Lines: "SEWER."
   3. All Others: No marking.

C. Coat inside and outside with bituminous varnish.

D. Manufacturers and Models:
   1. Opelika Foundry.
   2. Or equal.

2.4 T-HANDLE VALVE WRENCHES

A. 2-Inch AWWA Nut Operator Wrenches: Not less than 2 operating wrenches shall be provided for each length required for valve operation with the tee-handle located approximately 4 ±3/4 feet above the ground surface.

B. Manufacturers:
   1. American-Darling Valve.
   2. Clow Valve Company.
   3. Mueller Co.
   4. Opelika Foundry Co.
   5. Or equal.

2.5 MANHOLES AND CATCH BASINS

A. Castings:
1. Catch Basins: Flat grate: Neenah, R-2501; EJIW, 1045 with Type M2 grate; or equal.
2. Mortar: ASTM C270, Type M.
3. Brick:
a. Concrete: ASTM C55, Type I, Grade N.
b. Clay: ASTM C62, Grade SW.
4. Grade Rings: ASTM C478.
5. Concrete: Division 03 Section “Cast-In-Place Concrete.”

2.6 FLOOR BOX

A. Designed for installation in concrete floor or slab and to provide a cover over valve operating nut.

B. Nonbushing type.

C. Manufacturers:
1. Clow Valve Co.
2. Or equal.

2.7 SLEEVES

A. Solid sleeves:
1. Provide solid sleeve compatible with CL 50 ductile iron pipe and existing pipe. Record drawings indicate existing pipe is CL 50 ductile iron pipe.
2. Solid sleeve to have cement mortar lining to match CL 50 ductile iron pipe.
3. End Connections: Mechanical Joint.

2.8 RESTRAINED FLANGE ADAPTERS

A. Suitable for installation on ductile iron and steel pipe as applicable.

B. Minimum 2:1 safety factor.

C. Working Pressure: 150 psi.

D. Allowable deflection of 1 degree minimum.

E. Materials:
1. Body: ASTM A536 ductile iron or carbon steel.
2. Bolts and Nuts: 300 Series stainless steel or zinc-plated.
3. Rubber Gasket: Suitable for sanitary sewage use.
4. Coating: Liquid epoxy protective coating suitable for sanitary sewage use.

F. Manufacturers:
1. Ebaa Iron Series 2100 Megaflange.
2. Smith Blair Series 911 Flange-Lock.
3. Or approved equal.

PART 3 - EXECUTION

3.1 LINE AND GRADE

A. Lay pipe to grades and elevations indicated on the Drawings.

B. Where no grades are indicated, lay pipe with a minimum of 5 feet of cover below final grade.

3.2 INSTALLATION

A. General:
1. Install items to be embedded before concrete is placed.
2. Fasten embedded items securely to prevent movement when concrete is placed.
3. Protect all materials before, during and after installation.
4. Prevent entrance of foreign materials.
5. Install pipe, fittings and appurtenances in strict accordance with Manufacturer's recommendations and as specified herein.

B. Placement of Pipe:
1. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.
2. Bell and Spigot: Clean and lubricate immediately prior to assembly.
3. Push-On Joints: Pipe end shall be tapered by grinding or filing back at least 1/8-inch on a 30 degree bevel.

C. Ductile Iron Pipe:
1. Install pipe and fittings and hydrants in accordance with AWWA C600 except as otherwise provided herein.
2. Fittings, in addition to those indicated on the Drawings, shall be provided in crossing utilities which may be encountered upon opening the trench.
3. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut end for push-on joint shall be beveled 30 degrees by grinding or filing back at least 1/8-inch.
4. Push-On Joint Assembly:
   a. Pipe shall be laid with bell ends looking ahead.
   b. A gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated.
   c. The plain end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be joined, and pushed home with a jack or by other means.
   d. After joining the pipe, a metal feeler shall be used to make certain that the gasket is correctly located.
5. Mechanical Joint Assembly:
   a. Install in accordance with AWWA C111, Appendix A and the instructions of the manufacturer.
   b. Under no condition shall extension wrenches or pipe over handle or ordinary ratchet wrench be used to secure great leverage.

D. Valves and Valve Boxes:
1. Set plumb on 4 inches of compacted MDOT 902, Granular Material, Class II, or MDOT 902 Open Graded Aggregates 34R.
2. Valve Boxes:
   a. Shall not transmit shock to valve.
   b. Plumb over operating nut.
   c. Set cover to finished grade.
   d. Witness.
3. Tapping Sleeve and Valve:
   a. Set at the direction of tapping Subcontractor.
   b. Set and remove tapping machine.

E. Manholes:
1. Base Section Placement: Full and even bearing.
2. Joints and Lift Holes: Mortared finish on inside of concrete block and precast concrete units.
3. Top of Casting Elevation:
   a. Gravel Areas: 6 inches below surface.
   b. Bituminous Base Course: At base course grade.
   c. Final Wearing Surface: At finished grade. Adjustment of castings from base course grade to finished grade is incidental.
   d. Ditches: 6 inches below ditch bottom or protruding not more than 6 inches above slope; as applicable.
   e. Other Areas: As directed by Engineer or Owner.
4. Eliminate visible leakage.

3.3 HANDLING PIPE AND FITTINGS

A. Take care in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe and fittings shall not be dropped.

B. All pipe and fittings shall be subjected to a careful inspection and hammer test just prior to being laid or installed. No piece shall be installed which is found to be defective.

C. If any defective pipe is discovered after it has been laid it shall be removed and replaced with a sound pipe in a satisfactory manner at no additional expense to Owner.

D. Repair damage to coatings as directed by Engineer or Owner.

3.4 THRUST CONTROL

A. General:
1. Allowable Methods: Restrained joints.

B. Restrained Joints: Restrain all pipe joints within given distance from each fitting and valve (all directions):

Table 1
Length of Restrained Pipe Required

Pipe Diameter	22-1/2 Degree Bends and Less	45 Degree Bends	90 Degree Bends Plugs and Valves	Tee Run	Tee Branch
6-inch	5-foot	10-foot	15-foot	10-foot	5-foot
8-inch	5-foot	10-foot	20-foot	10-foot	5-foot
10-inch	5-foot	15-foot	25-foot	10-foot	10-foot
12-inch	10-foot	15-foot	30-foot	10-foot	15-foot
16-inch	10-foot	20-foot	40-foot	10-foot	25-foot

3.5 PRESSURE TESTING

A. General:
1. Observation: By Engineer.
2. Notification: Arrange with Engineer following successful pretesting.
3. Visible leaks in all process piping systems shall be repaired.

B. Pre-Flushing:
1. Prior to flushing ductile iron force mains or associated ductile iron service lines, the Contractor shall pig the force main or service line using a low density, bare swab of the appropriate size. All ductile iron lines greater than 200 feet are required to be pigged prior to flushing unless otherwise approved by Engineer. Line installations less than 200 feet do not require pigging prior to the flushing and pressure testing.
2. The Contractor shall flush force mains prior to pressure testing for a length of time and with flow velocities adequate to flush foreign materials out of the pipe and valves.

C. Provide all equipment (pumps, plugs, hoses, gages, etc.) to perform tests.

D. Pressure Testing:
1. AWWA C 600.
2. Duration: 2 hours.
3. Pressure test the following piping systems at the indicated pressure:
   a. Lime sludge force main: 100 psi.
4. Make-up Water: From measurable source.

5. Maximum allowable leakage:

$$L = \frac{SxDxP^{0.5}}{148{,}000} + 0.0078 \text{ gal/hr/in of diameter for each closed valve tested against}$$

Where:

L = Leakage in gallons per hour.
S = Length of pipe tested in feet.
D = Pipe diameter in inches.
P = Test pressure in psi.

6. Maximum length of pipe to be tested 2,000 feet, or nearest 2 valves if water on opposite side of valve is not in service.
7. Perform test against tapped cap or plug with a standpipe and not against existing valve if water on opposite side of valve is in service.
8. Repair leaks and repeat tests until acceptable results are achieved.

3.6 CLEANING

A. Prior to acceptance of the work of this Section, thoroughly clean all installed materials and products and related areas in accordance with Division 01 Section “Cleaning and Waste Management.”

END OF SECTION 33 90 10

APPENDIX

ATTACHMENT B
GENERAL DECLARATIONS

City of Ann Arbor
Guy C. Larcom Municipal Building
Ann Arbor, Michigan 48107

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including City Nondiscrimination requirements and Declaration of Compliance Form, Living Wage requirements and Declaration of Compliance Form, Prevailing Wage requirements and Declaration of Compliance Form, Vendor Conflict of Interest Form, Notice of Pre-Bid Conference, General Information, Bid, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans (if applicable) and understands them. The Bidder declares that it conducted a full investigation at the site and of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance. The Bidder also declares that it has extensive experience in successfully completing projects similar to this one.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the City of Ann Arbor, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

The undersigned proposes to perform all work shown on the plans or described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, and other means of construction to do all the work, furnish all the materials, and complete the work in strict accordance with all terms of the Contract of which this Bid is one part.

In accordance with these bid documents, and Addenda numbered One, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

The Bidder declares that it has become fully familiar with the liquidated damage clauses for completion times and for compliance with City Code Chapter 112, understands and agrees that the liquidated damages are for the non-quantifiable aspects of non-compliance and do not cover actual damages that may be shown and agrees that if awarded the Contract, all liquidated damage clauses form part of the Contract.

The Bidder declares that it has become fully familiar with the provisions of Chapter 14, Section 1:320 (Prevailing wages) and Chapter 23 (Living Wage) of the Code of the City of Ann Arbor and that it understands and agrees to comply, to the extent applicable to employees providing services to the City under this Contract, with the wage and reporting requirements stated in the City Code provisions cited. Bidder certifies that the statements contained in the City Prevailing Wage and Living Wage Declaration of Compliance Forms are true and correct. Bidder further agrees that the cited provisions of Chapter 14 and Chapter 23 form a part of this Contract.

The Bidder declares that it has become familiar with the City Conflict of Interest Disclosure Form and certifies that the statement contained therein is true and correct.

The Bidder encloses a certified check or Bid Bond in the amount of 5% of the total of the Bid Price. The Bidder agrees both to contract for the work and to furnish the necessary Bonds and insurance documentation within 10 days after being notified of the acceptance of the Bid.

If this Bid is accepted by the City and the Bidder fails to contract and furnish the required Bonds and insurance documentation within 10 days after being notified of the acceptance of this Bid, then the Bidder shall be considered to have abandoned the Contract and the certified check or Bid Bond accompanying this Bid shall become due and payable to the City.

If the Bidder enters into the Contract in accordance with this Bid, or if this Bid is rejected, then the accompanying check or Bid Bond shall be returned to the Bidder.

In submitting this Bid, it is understood that the right is reserved by the City to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the City believes to be in its best interest.

SIGNED THIS 2nd DAY OF April, 2025.

Fonson Company, Inc.	[signature]
Bidder's Name	Authorized Signature of Bidder
7644 Whitmore Lake Rd. Brighton, MI 48116	Brendan Fons
Official Address	(Print Name of Signer Above)
810-231-5188	estimating@fonsoninc.com
Telephone Number	Email Address for Award Notice

ATTACHMENT C
LEGAL STATUS OF BIDDER

(The bidder shall fill out the appropriate form and strike out the other three.)

Bidder declares that it is:

* A corporation organized and doing business under the laws of the State of Michigan, for whom Brendan Fons, bearing the office title of Secretary, whose signature is affixed to this Bid, is authorized to execute contracts.

NOTE: If not incorporated in Michigan, please attach the corporation's Certificate of Authority

• A limited liability company doing business under the laws of the State of _____, whom _____ bearing the title of _____ whose signature is affixed to this proposal, is authorized to execute contract on behalf of the LLC.

* A partnership, organized under the laws of the state of _____ and filed in the county of _____, whose members are (list all members and the street and mailing address of each) (attach separate sheet if necessary):

_____

_____

_____

_____

_____

* An individual, whose signature with address, is affixed to this Bid: __ _____ (initial here)

Authorized Official

_____ **Date** April 2, 2025

(Print) Name Brendan Fons Title Secretary

Company: Fonson Company, Inc.

Address: 7644 Whitmore Lake Rd. Brighton, MI 48116

Contact Phone (810) 231-5188 Fax (810) 231-5404

Email estimating@fonsoninc.com

ATTACHMENT D
PREVAILING WAGE DECLARATION OF COMPLIANCE

The "wage and employment requirements" of Section 1:320 of Chapter 14 of Title I of the Ann Arbor City Code mandates that the city not enter any contract, understanding or other arrangement for a public improvement for or on behalf of the city unless the contract provides that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. Where the contract and the Ann Arbor City Code are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used. Further, to the extent that any employees of the contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with section 1:320 of Chapter 14 of Title I of the Code of the City of Ann Arbor, employees shall be paid a prescribed minimum level of compensation (i.e. Living Wage) for the time those employees perform work on the contract in conformance with section 1:815 of Chapter 23 of Title I of the Code of the City of Ann Arbor.

At the request of the city, any contractor or subcontractor shall provide satisfactory proof of compliance with this provision.

The Contractor agrees:

(a) To pay each of its employees whose wage level is required to comply with federal, state or local prevailing wage law, for work covered or funded by this contract with the City,

(b) To require each subcontractor performing work covered or funded by this contract with the City to pay each of its employees the applicable prescribed wage level under the conditions stated in subsection (a) or (b) above.

(c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.

(d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the wage and employment provisions of the Chapter 14 of the Ann Arbor City Code. The undersigned certifies that he/she has read and is familiar with the terms of Section 1:320 of Chapter 14 of the Ann Arbor City Code and by executing this Declaration of Compliance obligates his/her employer and any subcontractor employed by it to perform work on the contract to the wage and employment requirements stated herein. The undersigned further acknowledges and agrees that if it is found to be in violation of the wage and employment requirements of Section 1:320 of the Chapter 14 of the Ann Arbor City Code it shall has be deemed a material breach of the terms of the contract and grounds for termination of same by the City.

Fonson Company, Inc.
Company Name

04/02/2025
Signature of Authorized Representative — Date

Brendan Fons, Secretary
Print Name and Title

7644 Whitmore Lake Rd. Brighton, MI 48116
Address, City, State, Zip

810-231-5188 estimating@fonsoninc.com
Phone/Email address

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500

ATTACHMENT E

LIVING WAGE ORDINANCE DECLARATION OF COMPLIANCE

The Ann Arbor Living Wage Ordinance (Section 1:811-1:821 of Chapter 23 of Title I of the Code) requires that an employer who is (a) a contractor providing services to or for the City for a value greater than $10,000 for any twelve-month contract term, or (b) a recipient of federal, state, or local grant funding administered by the City for a value greater than $10,000, or (c) a recipient of financial assistance awarded by the City for a value greater than $10,000, shall pay its employees a prescribed minimum level of compensation (i.e., Living Wage) for the time those employees perform work on the contract or in connection with the grant or financial assistance. The Living Wage must be paid to these employees for the length of the contract/program.

Companies employing fewer than 5 persons and non-profits employing fewer than 10 persons are exempt from compliance with the Living Wage Ordinance. If this exemption applies to your company/non-profit agency please check here [___] *No. of employees*__

The Contractor or Grantee agrees:

(a) To pay each of its employees whose wage level is not required to comply with federal, state or local prevailing wage law, for work covered or funded by a contract with or grant from the City, no less than the Living Wage. The current Living Wage is defined as $17.08/hour for those employers that provide employee health care (as defined in the Ordinance at Section 1:815 Sec. 1 (a)), or no less than $19.04/hour for those employers that do not provide health care. The Contractor or Grantor understands that the Living Wage is adjusted and established annually on April 30 in accordance with the Ordinance and covered employers shall be required to pay the adjusted amount thereafter to be in compliance with Section 1:815(3).

Check the applicable box below which applies to your workforce

[___] Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage without health benefits

[x] Employees who are assigned to any covered City contract/grant will be paid at or above the applicable living wage with health benefits

(b) To post a notice approved by the City regarding the applicability of the Living Wage Ordinance in every work place or other location in which employees or other persons contracting for employment are working.

(c) To provide to the City payroll records or other documentation within ten (10) business days from the receipt of a request by the City.

(d) To permit access to work sites to City representatives for the purposes of monitoring compliance, and investigating complaints or non-compliance.

(e) To take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee covered by the Living Wage Ordinance or any person contracted for employment and covered by the Living Wage Ordinance in order to pay the living wage required by the Living Wage Ordinance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services or agrees to accept financial assistance in accordance with the terms of the Living Wage Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Living Wage Ordinance, obligates the Employer/Grantee to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract or grant of financial assistance.

Fonson Company, Inc.
Company Name

7644 Whitmore Lake Rd.
Street Address

04/02/2025
Signature of Authorized Representative — Date

Brighton, MI 48116
City, State, Zip

Brendan Fons, Secretary
Print Name and Title

810-231-5188 estimating@fonsoninc.com
Phone/Email address

Attachment F

CITY OF ANN ARBOR
LIVING WAGE ORDINANCE

RATE EFFECTIVE APRIL 30, 2025 - ENDING APRIL 29, 2026

$17.08 per hour
If the employer provides health care benefits*

$19.04 per hour
If the employer does **NOT** provide health care benefits*

Employers providing services to or for the City of Ann Arbor or recipients of grants or financial assistance from the City of Ann Arbor for a value of more than $10,000 in a twelve-month period of time must pay those employees performing work on a City of Ann Arbor contract or grant, the above living wage.

ENFORCEMENT

The City of Ann Arbor may recover back wages either administratively or through court action for the employees that have been underpaid in violation of the law. Persons denied payment of the living wage have the right to bring a civil action for damages in addition to any action taken by the City.

Violation of this Ordinance is punishable by fines of not more than $500/violation plus costs, with each day being considered a separate violation. Additionally, the City of Ann Arbor has the right to modify, terminate, cancel or suspend a contract in the event of a violation of the Ordinance.

* Health Care benefits include those paid for by the employer or making an employer contribution toward the purchase of health care. The employee contribution must not exceed $.50 an hour for an average work week; and the employer cost or contribution must equal no less than $1/hr for the average work week.

The Law Requires Employers to Display This Poster Where Employees Can Readily See It.

For Additional Information or to File a Complaint contact
Colin Spencer at 734/794-6500 or cspencer@a2gov.org

ATTACHMENT G

Vendor Conflict of Interest Disclosure Form

All vendors interested in conducting business with the City of Ann Arbor must complete and return the Vendor Conflict of Interest Disclosure Form in order to be eligible to be awarded a contract. Please note that all vendors are subject to comply with the City of Ann Arbor's conflict of interest policies as stated within the certification section below.

If a vendor has a relationship with a City of Ann Arbor official or employee, an immediate family member of a City of Ann Arbor official or employee, the vendor shall disclose the information required below.

1. No City official or employee or City employee's immediate family member has an ownership interest in vendor's company or is deriving personal financial gain from this contract.
2. No retired or separated City official or employee who has been retired or separated from the City for less than one (1) year has an ownership interest in vendor's Company.
3. No City employee is contemporaneously employed or prospectively to be employed with the vendor.
4. Vendor hereby declares it has not and will not provide gifts or hospitality of any dollar value or any other gratuities to any City employee or elected official to obtain or maintain a contract.
5. Please note any exceptions below:

Conflict of Interest Disclosure*	
Name of City of Ann Arbor employees, elected officials or immediate family members with whom there may be a potential conflict of interest.	( ) Relationship to employee ( ) Interest in vendor's company ( ) Other (please describe in box below)
None	

*Disclosing a potential conflict of interest does not disqualify vendors. In the event vendors do not disclose potential conflicts of interest and they are detected by the City, vendor will be exempt from doing business with the City.

I certify that this Conflict of Interest Disclosure has been examined by me and that its contents are true and correct to my knowledge and belief and I have the authority to so certify on behalf of the Vendor by my signature below:		
Fonson Company, Inc.		810-231-5188
Vendor Name		**Vendor Phone Number**
Brendan Fons	04/02/2025	Brendan Fons, Secretary
Signature of Vendor Authorized Representative	**Date**	**Printed Name of Vendor Authorized Representative**

Questions about this form? Contact Procurement Office City of Ann Arbor Phone: 734/794-6500, procurement@a2gov.org

ATTACHMENT H

DECLARATION OF COMPLIANCE

Non-Discrimination Ordinance

The "non discrimination by city contractors" provision of the City of Ann Arbor Non-Discrimination Ordinance (Ann Arbor City Code Chapter 112, Section 9:158) requires all contractors proposing to do business with the City to treat employees in a manner which provides equal employment opportunity and does not discriminate against any of their employees, any City employee working with them, or any applicant for employment on the basis of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight. It also requires that the contractors include a similar provision in all subcontracts that they execute for City work or programs.

In addition the City Non-Discrimination Ordinance requires that all contractors proposing to do business with the City of Ann Arbor must satisfy the contract compliance administrative policy adopted by the City Administrator. A copy of that policy may be obtained from the Purchasing Manager

The Contractor agrees:

(a) To comply with the terms of the City of Ann Arbor's Non-Discrimination Ordinance and contract compliance administrative policy, including but not limited to an acceptable affirmative action program if applicable.

(b) To post the City of Ann Arbor's Non-Discrimination Ordinance Notice in every work place or other location in which employees or other persons are contracted to provide services under a contract with the City.

(c) To provide documentation within the specified time frame in connection with any workforce verification, compliance review or complaint investigation.

(d) To permit access to employees and work sites to City representatives for the purposes of monitoring compliance, or investigating complaints of non-compliance.

The undersigned states that he/she has the requisite authority to act on behalf of his/her employer in these matters and has offered to provide the services in accordance with the terms of the Ann Arbor Non-Discrimination Ordinance. The undersigned certifies that he/she has read and is familiar with the terms of the Non-Discrimination Ordinance, obligates the Contractor to those terms and acknowledges that if his/her employer is found to be in violation of Ordinance it may be subject to civil penalties and termination of the awarded contract.

Fonson Company, Inc.
Company Name

04/02/2025
Signature of Authorized Representative — Date

Brendan Fons, Secretary
Print Name and Title

7644 Whitmore Lake Rd. Brighton, MI 48116
Address, City, State, Zip

810-231-5188 estimating@fonsoninc.com
Phone/Email Address

Questions about the Notice or the City Administrative Policy, Please contact:
Procurement Office of the City of Ann Arbor
(734) 794-6500

ATTACHMENT I

CITY OF ANN ARBOR NON-DISCRIMINATION ORDINANCE

Relevant provisions of Chapter 112, Nondiscrimination, of the Ann Arbor City Code are included below. You can review the entire ordinance at www.a2gov.org/humanrights.

Intent: It is the intent of the city that no individual be denied equal protection of the laws; nor shall any individual be denied the enjoyment of his or her civil or political rights or be discriminated against because of actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight.

Discriminatory Employment Practices: No person shall discriminate in the hire, employment, compensation, work classifications, conditions or terms, promotion or demotion, or termination of employment of any individual. No person shall discriminate in limiting membership, conditions of membership or termination of membership in any labor union or apprenticeship program.

Discriminatory Effects: No person shall adopt, enforce or employ any policy or requirement which has the effect of creating unequal opportunities according to actual or perceived age, arrest record, color, disability, educational association, familial status, family responsibilities, gender expression, gender identity, genetic information, height, HIV status, marital status, national origin, political beliefs, race, religion, sex, sexual orientation, source of income, veteran status, victim of domestic violence or stalking, or weight for an individual to obtain housing, employment or public accommodation, except for a bona fide business necessity. Such a necessity does not arise due to a mere inconvenience or because of suspected objection to such a person by neighbors, customers or other persons.

Nondiscrimination by City Contractors: All contractors proposing to do business with the City of Ann Arbor shall satisfy the contract compliance administrative policy adopted by the City Administrator in accordance with the guidelines of this section. All city contractors shall ensure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity and tends to eliminate inequality based upon any classification protected by this chapter. All contractors shall agree not to discriminate against an employee or applicant for employment with respect to hire, tenure, terms, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of any applicable protected classification. All contractors shall be required to post a copy of Ann Arbor's Non-Discrimination Ordinance at all work locations where its employees provide services under a contract with the city.

Complaint Procedure: If any individual believes there has been a violation of this chapter, he/she may file a complaint with the City's Human Rights Commission. The complaint must be filed within 180 calendar days from the date of the individual's knowledge of the allegedly discriminatory action or 180 calendar days from the date when the individual should have known of the allegedly discriminatory action. A complaint that is not filed within this timeframe cannot be considered by the Human Rights Commission. To file a complaint, first complete the complaint form, which is available at www.a2gov.org/humanrights. Then submit it to the Human Rights Commission by e-mail (hrc@a2gov.org), by mail (Ann Arbor Human Rights Commission, PO Box 8647, Ann Arbor, MI 48107), or in person (City Clerk's Office). For further information, please call the commission at 734-794-6141 or e-mail the commission at hrc@a2gov.org.

Private Actions For Damages or Injunctive Relief: To the extent allowed by law, an individual who is the victim of discriminatory action in violation of this chapter may bring a civil action for appropriate injunctive relief or damages or both against the person(s) who acted in violation of this chapter.

THIS IS AN OFFICIAL GOVERNMENT NOTICE AND
MUST BE DISPLAYED WHERE EMPLOYEES CAN READILY SEE IT.

Michigan Department
Of Transportation
CP-347 (04/10)

MICHIGAN DEPARTMENT OF TRANSPORTATION

CERTIFIED PAYROLL

COMPLETION OF CERTIFIED PAYROLL FORM FULFILLS THE MINIMUM MDOT PREVAILING WAGE REQUIREMENTS

(1) NAME OF CONTRACTOR / SUBCONTRACTOR (CIRCLE ONE)	(2) ADDRESS		
(3) PAYROLL NO.	(4) FOR WEEK ENDING	(5) PROJECT AND LOCATION	(6) CONTRACT ID

(a) EMPLOYEE INFORMATION	(b) WORK CLASSIFICATION	(c) Hour Type	(d) DAY AND DATE HOURS WORKED ON PROJECT							(e) TOTAL HOURS ON PROJECT	(f) PROJECT RATE OF PAY	(g) PROJECT RATE OF FRINGE PAY	(h) GROSS PROJECT EARNED / GROSS WEEKLY EARNED	(i) TOTAL WEEKLY HOURS WORKED ALL JOBS	(j) DEDUCTIONS FICA	FEDERAL	STATE		OTHER	TOTAL DEDUCT	(k) TOTAL WEEKLY WAGES PAID FOR ALL JOBS
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											
NAME:										0			$0.00							$0.00	$0.00
ETH/GEN: ID #:	GROUP/CLASS #:	S								0											

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,
all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.