THE CITY OF
TALLMADGE
HISTORY MOVING FORWARD

SPECIFICATIONS & PROPOSAL:

BEECHWOOD DRIVE
WATERLINE EXTENSION-2021

Bids due by: *May 12, 2021 @ 10 a.m.*

Submitted By:

Company Name

Street Address

City **State** **Zip**

Contact Person **Phone No.** **Email Address**

David G. Kline, Mayor
Michael Rorar, Director of Public Service

46 North Avenue, Tallmadge, Ohio 44278 Phone 330-633-0854 ▪ Fax 330-633-1359

City of Tallmadge Department of Public Service
Invitation to Bid

Separate sealed Bids for the construction of Beechwood Drive Waterline Looping will be received by the City of Tallmadge at the Public Service Department, 46 North Avenue, Tallmadge, Ohio 44278, until 10:00 a.m. (local time), Wednesday May 12, 2021. (City Hall is open for public access Monday thru Friday from 10:00 a.m. to 3:00 p.m.) Bids being opened immediately thereafter in the Council Chambers of the Municipal Building.

The work covered by the Contract Documents for the Base Project includes the following:

Installation of approximately 915 lineal feet of new 8-inch PVC waterline installed via open-cut and horizontal directional drill construction methods, fire hydrants, valves, new water services, and all other appertaining work necessary to complete the work along Beechwood Drive.

The estimated construction cost is $190,000 as of February 19, 2021.

Detailed information, proposal forms and complete specifications may be obtained from the City of Tallmadge website at https://www.tallmadge-ohio.org.

Bidders must use the forms available on the website as no other will be accepted. Proposals must include a price for each item in the Bid Proposal form. Incomplete proposals will be considered informal and will not be considered. Each bid must contain the full name of every person or company participating in the bid.

A bid bond equal to 100% of the bid or a certified check, cashier's check, or a letter of credit in the amount of 10% of the bid to be held as guarantee that in the event a contract is awarded to the bidder, such contract will be duly executed, and its performance properly secured. Should any bid not be awarded or be rejected, such check or bond will be returned to the bidder or bidders after the execution of the contract.

The award of this contract shall be to the lowest and best bidder. The City of Tallmadge reserves the right to reject any or all bids and to accept the bid(s) deemed most beneficial to the City of Tallmadge.

The bidder is responsible for monitoring the above-named website for any official addenda.

Prospective BIDDERS may address written inquiries Mr. Jeff Marnicio, PE, at Burgess & Niple, Inc. by emailing questions to jeff.marnicio@burgessniple.com. All inquiries must be submitted in writing.

BIDDERS must comply with the prevailing wage rates on Public Improvements in Summit County, as determined by the Bureau of Wage and Hour, Division of Labor and Worker Safety, Department of Commerce of the State of Ohio.

Attention to the BIDDERS is called to the Instructions to Bidders, which are included in the proposed Contract Documents.

Successful Bidders shall be required to comply with all laws pertaining to minimum wage and discrimination of persons.

The City of Tallmadge reserves the right to reject any and all Bids or to increase or decrease or omit any item or items and/or award to the lowest and best BIDDER. Each proposal must contain the full name of every person or company interested in the same. The City of Tallmadge reserves the right to waive any informalities or irregularities in the Bidding.

By order of the: Ordinance 49-2021

Mayor of Tallmadge David Kline
Director of Public Service Mike Rorar

Published in the Akron Beacon Journal:
April 18, 2021
April 25, 2021

Table of Contents and Bidder's Checklist

A complete bid packet will consist of the items listed below.

Complete this checklist to confirm the items required in your bid. Place a checkmark or "X" next to each item that you are submitting to the City of Tallmadge. Failure to submit the listed documents may be cause for rejection of your bid. This checklist should be returned with your bid.

_____ Cover sheet (Page 1)

_____ Invitation to Bid (Page 2-3)

_____ Table of Contents and Bidder's Checklist (Page 4)

_____ Section I: Instruction to Bidders (Page 5)

_____ Section II: Bid Forms (Pages 6 - 50)

_____ Section III: Tallmadge Codified Ordinance (Page 51)

_____ Section IV: Equipment List (to be submitted with bid) (Page 52)

_____ Section V: Bidder References (to be submitted with bid) (Page 53)

_____ Section VI: Experience of Management/Supervisory Personnel (Page 54)

_____ Section VII: Prevailing Wage Requirements and Affidavit of Compliance (Pages 55 – 56)

_____ Section VIII: Technical Specifications

SECTION I: INSTRUCTIONS TO BIDDERS

1. The BASE BID shall include all work associated from Sta. 10+00 to Sta. 14+33 as shown on PlanSheet 8.

2. The ADD ALTERNATE shall include all work associated from Sta. 15+00 to Sta. 19+68 asshown on Plan Sheet 9.

3. The OWNER reserves the right to award or not award the CONTRACT to the *lowest* and *mostqualified* BIDDER for the BASE BID.

4. The OWNER reserves the right to award or not award an ADD ALTERNATE to the BASE BIDCONTRACT selected and awarded by the OWNER. No separate CONTRACT will be awarded for the ADD ALTERNATES.

5. The Contractor, its agents, successors and assigns shall comply with all rules of the Summit County Health Department and City and all applicable Ohio Department of Health and CDCGuidelines.

6. Contractor is responsible to provide a safe workplace and to comply with OSHA and otherfederal, state or local health and safety regulations.

7. Contractor must contact Energy Transfer Company and abide by all General Guidelines for Third- Party Construction or Maintenance Activities on pages 37 -43 prior to crossing the Sun Pipeline.

8. Traffic Control. The Contractor must follow the Ohio Manual of Uniform Traffic Control Devices (OMUTCD). The current edition of the OMUTCD can be found at the following link: http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/traffic/OhioMUTC D/Pages/OMUTCD2012_current_default.aspx

SECTION II: BID FORMS

_____ Bid Form 1: Note

_____ Bid Form 2: Bid Guaranty and Contract Bond

_____ Bid Form 3: Non-Collusion Affidavit

_____ Bid Form 4: Statement of Non – Liability for Delinquent Personal Property Taxes

_____ Bid Form 5: Statement of Liability for Delinquent Personal Property Taxes

_____ Bid Form 6: Certification of Drug Free Workplace

_____ Bid Form 7: Certification for Local Preference

_____ Bid Form 8: Affidavit in Compliance with Section 3517.13

_____ Bid Form 9: Independent Contractor Anti-Bias Disclosure

_____ Bid Form 10: Certification of No Personal Interest

_____ Bid Form 11: PERS Independent Worker/ Contractor Acknowledgment Form

_____ Bid Form 12: OPERS Form

_____ Bid Form 13: Scope of Bids

_____ Bid Form 14: Bid Form – Base Bid, Add Alternate ‘A’ & Add Alternate ‘B’

NOTE

The bidder hereby agrees that the Public Service Director has the right to reject any or all bids and to waive informality in any bid and that the bidder shall not dispute the correctness of the quantities used in computing the lowest and best bidder.

_____
(Signature of Officer, Partner or Owner)

_____
(Date)

_____

_____
(Business Address of Bidder)

_____
(Business Phone Number of Bidder)

CERTIFIED CHECK OR BID BOND

Certified check or bid bond in the amount of: _____

_____on
(State Amount)

_____
(Name of Bank or Bonding Company)

deposited herewith.

_____
(Bidder)

_____
(Date)

ALL BIDS NOT IN CONFORMITY WITH THESE PROVISIONS WILL BE REJECTED.

BID GUARANTY/ CONTRACT BOND/ MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned _____ _____ as Principal, and _____as Sureties, are hereby held and firmly bound unto the

CITY OF TALLMADGE, OHIO

as Obligee in the penal sum of the dollar amount of the Bid submitted by the Principal to the Obligee on the ____ day of _____, 20___ to undertake the Project known as:

_____

The penal sum referred to herein shall be the dollar amount of the Principal's Bid to the Obligee, incorporating any additive or deductive alternate proposals made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of _____ _____ _____ dollars ($_____). (If the foregoing blank is not filled in, the penal sum will be the amount of the Principal's Bid, including alternates. Alternatively, if the blank is filled in, the amount stated must not be less than the full amount of the Bid including alternates, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above name Principal has submitted a Bid for_____ _____ for the City of Tallmadge, Ohio;

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

NOW ALSO, if the said Principal shall well and faithfully do and perform the things agreed by said Principal to be done and performed according to the terms of said Contract; and shall pay all lawful claims of Subcontractors, materialmen, and laborers, for labor performed and materials furnished in the carrying forward, performing, or completing of said Contract; we agreeing and assenting that this undertaking shall be for the benefit of any materialman or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that a maintenance guarantee, with good and sufficient surety, in the amount of ten percent (10%) of the amount of the performance guarantee for a period of two (2) years from and after the date of completion and acceptance by the Owner, replace any and all defects arising in the Work, whether

resulting from defective materials or defective workmanship, after such period this obligation shall be null and void; otherwise it will remain in full force and effect.

The said Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of the said Contract or in or to the Drawings or Specifications therefor shall in any wise affect the obligations of said Surety on its Bond.

IN WITNESS WHEREOF, we have hereunto set our hands and seal this

_____day of _____, 20_____.

_____Principal

By_____

_____Surety

By_____

Address_____

Phone No. _____

(SEAL)

IMPORTANT - Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

NON-COLLUSION AFFIDAVIT

STATE OF_____)
) SS.
COUNTY OF)

Being duly sworn, do depose and say:

that _____
(Insert names of all persons, firms or corporations interested in the bid.)

its agent, officers or employees have not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal; and also that no member of the Council, head of any Department or bureau, or employee therein, or any officer of the City of Tallmadge is directly or indirectly interested therein.

_____
(Signature)

_____
(Title)

Sworn to and subscribed before me this_____day of_____, 20____

_____
Notary Public in and for the

COUNTY OF_____, STATE OF_____

My commission expires_____, 20____.

THIS AFFIDAVIT MUST BE EXECUTED FOR THE APPLICATION TO BE CONSIDERED.

STATEMENT OF NON-LIABILITY
FOR DELINQUENT PERSONAL PROPERTY TAXES*

STATE OF OHIO)
)SS:
COUNTY OF _____)

_____, being first duly sworn, says that
(See note below)
at the time of the submission of said bid said affiant was not charged with delinquent personal property taxes on the general tax list of personal property of _____.

_____
(Name of County and State)

(See note below)

Sworn to and subscribed before me this ____ day of _____ 20_____.

_____
Notary Public in and for the

COUNTY OF _____ STATE_____

My Commission expires _____

Note:
Where an individual has submitted a bid, the name of the individual should appear here. Where an individual signs for a partnership, the name of the partner signing for the partnership should appear together with the name of the partnership. Where a corporation has submitted a bid, the name of the officer, his position, and the name of the corporation should appear.

*Complete either Statement of Non-Liability or Statement of Liability, but not both.

STATEMENT OF LIABILITY
FOR DELINQUENT PERSONAL PROPERTY TAXES*

STATE OF OHIO)
)SS:
COUNTY OF _____)

_____, being first duly sworn, says that
(See note below)

he may be awarded a contract by_____
(Name of Subdivision)

after competitive bidding; and that at the time of the submission of said affivant

was charged with delinquent personal property taxes on the general tax list of

personal property of _____.
(Name of County and State)
and that the amount of the due and unpaid delinquent tax is $_____ and

that the amount of the due and unpaid penalties and interest is $_____.

Sworn to and subscribed before me this_____ day_____ of 20__.

_____
Notary Public in and for the

COUNTY OF _____ STATE OF _____

My commission expires_____

Note:
Where an individual has submitted a bid, the name of the individual should appear here. Where an individual signs for a partnership, the name of the partner signing for the partnership should appear together with the name of the partnership. Where a corporation has submitted a bid, the name of the officer, his position, and the name of the corporation should appear.

*Complete either Statement of Non-Liability or Statement of Liability, but not both.

CERTIFICATION OF
DRUG FREE WORKPLACE

BIDDER'S NAME: _____

ADDRESS:

_____

CITY, STATE:

_____

Project:

_____

CERTIFICATION

The undersigned, being a duly authorized agent of the Bidder does certify that the following facts are true:

1. Bidder has published and provided to employees notice that the manufacture, use, possession, or distribution of drugs in the work place is prohibited, as well as a specification of the disciplinary action that may be taken against employees who violate that prohibition.
2. It is the policy of the Bidder that any employee convicted of violating a criminal drug statute occurring in the work place is required to notify the employer of said conviction within five (5) days after such conviction.
3. Bidder has published notice specifying the sanctions for or requiring satisfactory participation in a drug abuse assistance or rehabilitation program by an employee convicted of violating a criminal drug statute occurring in the workplace.
4. Bidder has implemented a program for the distribution of information on drug abuse awareness and the availability of counseling and referral services.

I further certify and understand that the City of Tallmadge, pursuant to Ordinance 142- 1994, can enter into a contract resulting from the competitive bidding process only with those Bidders who provide a drug free workplace by meeting the above requirements.

DATE: _____

Signature: _____

Title:

_____

CERTIFICATION FOR
LOCAL PREFERENCE

The undersigned bidder does hereby certify that his principal place of business is within the corporate limits of the City of Tallmadge, Ohio or within the Brimfield / Tallmadge JEDD Area and that he qualifies as a ***"local business"*** by complying with the following policy as established by Ord. 126-97 Section 143.06:

Local Preference Policy

A. DEFINITIONS:

1. "Business" means a domestic corporation, sole proprietorship, partnership, or joint venture whose principal place of business is located in Tallmadge, Ohio or is located within the area designated as a Joint Economic Development District as established by the City of Tallmadge and the Township of Brimfield. If one party to joint venture has its principal place of business in Tallmadge, Ohio, or is located within the Joint Economic Development District, the joint venture shall be considered as having its principal place of business in Tallmadge. No business as defined herein shall benefit from the local preference policy unless it is participating in the JEDD by withholding and paying City income tax.
2. "Bidder" means the respondent to invitations to bid and/or to requests for proposals.

B. Bidders having established their principal place of business in Tallmadge, Ohio for two successive calendar years immediately preceding the bid opening date or proposal date, may be preferred as lowest if their bid does not exceed the lowest bid by more than 3%, not to exceed ten thousand dollars ($10,000) of the apparent low bid.

C. To qualify for local preference bidders shall include the following on their bid or proposal documents:

1. Certification that "The bidder of offer hereby certifies that its principal place of business is in Tallmadge, Ohio and has been for at least two successive years immediately preceding the opening date herein".
2. Location of principal place of business.
3. Date of business establishment
4. If the bid is for a City vehicle or motor vehicle or accessory, the bidder's price shall be the same as or lower than the State Purchasing Program price.

D. Each bidder shall have only one principal place of business.

E. Local preference may be applied as provided herein where prohibited by state or federal law.

F. Local preference may be applied in considering the lowest bid and shall not waive or nullify evaluation of bidders which are responsive and responsible or lowest and best.

G. In determining the qualifications of bidders for supplies, commodities, materials, equipment, furnishings or general services as lowest responsive and responsible or lowest and best bidder, the Board of Control shall exercise a preference of local bidders as provided for herein. The local preference shall apply to contracts for the building, repair or renovation of public buildings or improvements

BIDDER'S NAME_____DATE BUSINESS ESTABLISHED

Location of principal place of business_____

Successive years at this location immediately prior to bid opening date: _____

DATED_____Signed_____

AFFIDAVIT IN COMPLIANCE WITH SECTION 3517.13

STATE OF OHIO
COUNTY OF_____ss:

Personally, appeared before me the undersigned, a bidder, a representative of a bidder, a contractor or vendor on behalf of

_____ for a contract for _____
(Name of Business) (Type of Product or Service)

to be let by the City of Tallmadge, who, being duly cautioned and sworn, makes the following statement with respect to prohibited activities constituting a conflict of interest or other violations under R.C. Section 3517.13, and further states that the undersigned has the authority to make the following representation on behalf of the entity if the undersigned as an individual is not the bidder himself or herself:

1. On behalf of the corporation, business trust, estate, individual business owner, partner or owner of partnership or other unincorporated business, shareholder of an association, that all of the following persons, where applicable, are in compliance with R.C. 3517.13.
    a. each owner of more than twenty percent of a corporation;
    b. each individual, partnership or other unincorporated business, association, including without limitation, professional associations;
    c. each shareholder of an association, administrator or executor of any estate and trustee of any trust, or political action committee associated with any of the foregoing;
    d. each spouse of the above;
    e. each child seven years of age to seventeen years of age of any of the above;
    f. any combination of the above.
2. The undersigned further certifies that if awarded a contract as a result of competitive bidding, or request for proposals, he, she or it shall not once the contract is awarded and extending until one year following the conclusion of the contract, make as an individual, one or more campaign contributions totaling in excess of $1,000 or collectively, contributions totaling in excess of $2,000 (over a twoyear period), to the holder of the public office having ultimate responsibility for the award of the contract or to the public officer's campaign committee, including individuals or groups of individuals specified in paragraph 1, above.

Signature_____

Title_____

Sworn to before me, a notary public, and subscribed in my presence this____day of_____20____.

Notary Public_____

My Commission Expires_____

CITY OF TALLMADGE
INDEPENDENT CONTRACTOR ANTI-BIAS DISCLOSURE

1. To the best of your knowledge, do you have any prior relationship(s) with any employee, elected official, or non-elected official of the City of Tallmadge?

☐	Yes
☐	No

2. If you answered yes to question number 1, Please check the appropriate box(es) that describe that relationship(s)

☐	Spouse
☐	Child whether dependent or independent
☐	Parent
☐	Grandparent
☐	Sibling
☐	Aunt/Uncle
☐	In-law
☐	Step-child
☐	Step-parent
☐	Step-grandparent
☐	Step-sibling
☐	Step-aunt/Step-Uncle
☐	Any other person related by blood or marriage and residing in the same household
☐	Prior business relationship or business associate
☐	Friend
☐	Other significant relationship

1. If you answered Other significant relationship in question number 2, please explain below:

_____

_____

_____

_____

_____

_____

2. Please provide below the name(s) of any and all employees of the City of Tallmadge with whom you have any of the above relationships:

_____

_____

_____

_____

_____

_____

I declare (or certify, verify, or state) under penalty of perjury that the foregoing is true and correct.

_____
Print Name

_____ _____
Signature Date

CITY OF TALLMADGE
CERTIFICATION OF NO PERSONAL INTEREST

Under penalty of perjury, I hereby certify that:

1. I am not a family member of any public official or public servant of the City of Tallmadge; unless otherwise disclosed in writing to all officers and elected officials of the city.

2. I am not a business associate of any public official or public servant of the City of Tallmadge unless otherwise disclosed in writing to all officers and elected officials of the city.

3. No officer, employee or assignee of the undersigned contractor is a family member or a business associate of the City of Tallmadge and has an ownership interest greater than 5% in the contractor's organization.

4. No owner, officer, employee or agent of contractor's organization gave, offered or promised anything of value, including future benefits, to a public servant or public official of the City of Tallmadge, other than the consideration expressly provided for in the contract.

DATE: _____

CONTRACTOR:

_____
Name of Organization

_____
Signature Title

OPERS Independent Worker/Contractor Acknowledgment Form Questionnaire

Please answer the questions below to determine if you will be required to complete the attached OPERS Independent Worker/Contractor Acknowledgment Form.

Question 1:

Are you a sole proprietor/independent contractor?

___ Yes. You are required to complete the attached OPERS Independent Worker/Contractor Acknowledgement Form. If you have less than 5 employees, each employee is also required to complete the form.

___ No. Please go to Question 2.

Question 2:

Are you a business entity with less than 5 employees?

___ Yes. You and each of your employees are required to complete the attached OPERS Independent Worker/Contractor Acknowledgement Form.

___ No. Please sign the statement below.

I have answered the above questions accurately and truthfully. Based on those answers, I will not be completing the OPERS Independent Worker/Contractor Acknowledgement Form .

_____ _____

Signature **Title**

_____

INDEPENDENT CONTRACTOR/WORKER ACKNOWLEDGMENT

OPERS
Ohio Public Employees Retirement System
277 East Town Street, Columbus, Ohio 43215-4642
Employer Outreach: 1-888-400-0965
www.opers.org

This form is to be completed if you are an individual who begins providing personal services to a public employer on or after Jan. 7, 2013 but are not considered by the public employer to be a public employee and will not have contributions made to OPERS. This form must be completed not later than 30 days after you begin providing personal services to the public employer.

STEP 1: Personal Information

Social Security Number

___ — ___ — ____

First Name | MI | Last Name

STEP 2: Public Employment Information

Name of Public Employer

Employer Contact

First Name | MI | Last Name

Employer Code

Employer Contact Phone Number

___ — ___ — ____

Service Provided to Public Employer

Start Date of Service

Month / Day / Year

__ / __ / ____

End Date of Service

Month / Day / Year

__ / __ / ____

STEP 3: Acknowledgment

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

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

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

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

Signature_____ Today's Date____/____/____

Do not print or type name

GENERAL GUIDELINES
FOR THIRD-PARTY CONSTRUCTION OR MAINTENANCE ACTIVITIES

Energy Transfer and its affiliates and related companies ("ET") are dedicated to the highest safety standards in the continued operation of their pipelines and facilities. Of utmost importance to ET is the continued safety of the public and its pipeline and facilities during construction and other activities on, across, over or under its right-of-way. ET is therefore pleased to provide these general guidelines ("Guidelines") for third-party construction, blasting, installation or modification of pipelines, underground utilities, roads, streets, driveways, ditches, drainage canals or any other type of temporary or permanent structure or obstruction or any other encroachment on, over, across, or paralleling, ET's right-of-way (hereinafter referred to as "Crossing" or "Crossings").

These Guidelines are intended to be consistent with State Code and are further based upon industry standards and practice. These Guidelines are merely guidelines and upon notification to ET of a proposed Crossing, as required by State Code, each proposed Crossing and its corresponding finalized plans and profile drawings will be evaluated by ET and the third-party requesting such Crossing, pending final approval.

1.Notification

a. The party requesting such Crossing shall use its best efforts to provide ET with its finalized plans and profile drawings at least thirty days (30) days prior to any related construction or maintenance activity. The Pipeline Facility shall include, but is not limited to, rights-of-way, fee properties, easements, pipelines, meter and regulator buildings and valve sites("ET Pipeline Facility" or "Facilities"). Unless otherwise agreed to by ET in writing, no equipment shall enter onto ET's Pipeline Facility unless an ET representative is on location.

b. No excavation shall occur in the vicinity of ET's pipeline facility until:

1)In accordance with the State approved Notification Centers, ET shall be notified at least48 hours in advance of any construction or maintenance activity. You must contact the State approved Notification Center at 811. Before commencing any Crossing at or near ET's Pipeline Facility you must also contact ET's Field Representative(s);

2)Unless otherwise agreed to by ET in writing, an ET inspector is on site to monitor the excavation activities.

2.Drawings for Proposed Construction or Maintenance

Any proposed construction or maintenance activity in the vicinity of ET's Pipeline Facility will require submittal of final plans and profile drawings for prior review and approval by ET. One(1)copy of these drawings must be submitted to ET's Encroachment Department via e-mailEncroachments@energytransfer.com. All plans and drawings must show in detail, all of ET's .

Pipeline Facilities, its corresponding right-of-way and any other landmarks that will assist ET to determine the location of the proposed Crossing and the affects of the proposed construction or maintenance activity on ET's Pipeline Facility.

3. Encroachment Agreement

In certain instances, due to the type of crossing required and the probable impact upon ET's Facilities, an encroachment agreement may be necessary for proposed construction or maintenance within ET's Pipeline Facility. ET shall be responsible for preparing such encroachment agreement and shall bear the cost and expense in such preparation. Such encroachment agreement shall outline the responsibilities, conditions and liabilities of the parties and must be fully executed and in ET's possession prior to commencing any construction activity.

4. Insurance Coverage

In certain instances, due to the type of crossing required and the probable impact upon ET's Facilities, ET may require evidence of comprehensive general liability insurance coverage prior to any construction or maintenance activity in the vicinity of its Facilities. In the event that ET requires evidence of comprehensive general liability insurance, ET and/or its affiliates and related companies, whichever the case may be, shall be named as additional insured.

5. Crossing Pipelines with Equipment

To protect ET's pipelines or related Facilities from additional external loading, ET may perform a field survey and an engineering study to determine the effects of any proposed activity over its pipelines or related Facilities. Mats, timber, bridges, or other protective materials deemed necessary and appropriate by ET may be required and placed over ET's pipelines or related Facilities for the duration of any loading. E-mail encroachments@energytransfer.com.

6. Excavation, Cuts, or Fill near ET's Pipeline Facility

a. Unless otherwise agreed to by ET in writing, an ET representative will be on location prior to and during construction activity within ET's Pipeline Facility.

b. No heavy equipment of any type will be permitted to work directly over ET's pipelines or related Facilities, unless otherwise agreed to in writing by ET.

c. All excavation within eighteen inches (18") of any pipeline will be performed by hand. At the discretion of ET's onsite representative, excavators may be required to hand dig beginning at a distance greater than eighteen inches (18").

d. All excavations within ET's Pipeline Facility shall be backfilled with a minimum of eight inches (8") lifts of backfill material, where pipeline padding is reduced ensure backfill is clean and free from rock, trash, concrete, rubbish, or hazardous material. Soil backfill must be compacted to the satisfaction of the ET onsite inspector so that settling does not occur.

e. No grade cuts will be permitted within ET's Pipeline Facility unless otherwise agreed to in writing by ET and with ET's representative on location. An engineering study may be performed to ensure that the lateral stability of ET's pipelines or related Facilities are not affected.

f. No fill shall be permitted within ET's Pipeline Facility unless otherwise agreed to in writing by ET. No more than twenty-four inches (24") of earthen fill material (pipeline cover not to exceed 7ft.), free from any rocks, trash, concrete, rubbish, rebar, hazardous materials, etc., will be permitted within ET's Pipeline Facility, unless otherwise agreed to in writing by ET.

g. Earthen cover over ET's pipelines shall be thirty-six inches (36") or no less than what was originally there prior to any construction. In the event that ET determines that a lesser cover will not increase the risk to the public or increase the risk of a break, leak, rupture or

other damage to ET's pipelines or related Facilities, ET may allow a lesser earthen cover, in a minimum amount as determined solely within the discretion of ET.

h. No trash or debris shall be placed in any excavation or left in or on ET's Pipeline Facility.
i. The creation of storm water outfalls or other water management controls which would make the pipeline right-of-way more susceptible to erosion shall be avoided or mitigated.

7. Aboveground Appurtenances, Structures and Obstructions

a. Unless otherwise agreed to in writing by ET, no aboveground appurtenances, structures, or obstructions of a temporary or permanent nature shall be located within ET's Pipeline Facility that, in any way, interfere with operating, maintaining, accessing, inspecting, repairing, modifying, replacing or relocating such Facilities. The appurtenances, structures and obstructions include, but are not limited to the following: buildings, structures, signage, utility poles, steel towers, guy wires, other structures supporting aerial lines, satellite dishes, manholes, catch basins, septic systems, utility pedestals, transformers, fire hydrant, large spoils of earthen materials, decks, pools, boats, RV's, trailers and storage of hazardous or non-hazardous materials.
b. Unless otherwise agreed to in writing by ET, no foreign towers (Wind Turbine and Communication Towers) are permitted within 1500 feet (1500') of company facilities. Refer any requests to the Right-of-Way Representative/Encroachments Group.

8. Proposed Pipe and Utility Lines

a. General Guidelines:

1. For the safety of the public and to lessen the risk of a break, leak, rupture or other damage to ET's Pipeline Facility and in furtherance of the state code, ET's Pipeline Facility shall be positively located by ET before any Crossings are constructed or installed near ET's Pipeline Facility.
2. Plan and profile drawings are required for all foreign utility crossings.
3. For open trench crossings, ET requires a minimum clearance of twenty-four inches (24") be maintained between the bottom of ET's pipeline or related Facilities and any foreign line or facilities unless otherwise agreed to in writing by ET.
4. For conventional bore crossings, ET requires a minimum clearance of thirty-six inches (36") below ET's pipeline/facilities.
5. For horizontal directionally drilled bore crossings, ET requires a minimum clearance of thirty-six inches (36") below ET's Facilities. For large diameter (twelve inches (12") or greater) foreign line crossings, a minimum of sixty inches (60") of clearance below company pipeline facilities the entire width of company right-of-way.
6. Excavate ET Facilities at the point of the proposed crossing on the approach side to verify the auger head, boring and installation process will not damage company pipeline facilities.
7. All foreign lines shall cross ET's Pipeline Facility at ninety degrees (90°) or at an angle of not less than forty-five degrees (45°), unless otherwise approved by ET. Longitudinal occupancy of ET's Pipeline Facility will not be permitted.
8. Buried utility lines must be identified with permanent aboveground markers where lines enter and exit ET's right-of-way. Installation and maintenance of the markers shall be the responsibility of the foreign line owner.
9. No manholes, valves or other appurtenances will be permitted within ET's Pipeline Facility.
10. No vertical or horizontal bends allowed within ET's Pipeline Facility unless approved by ET.

11. ET's Pipeline Facility is cathodically protected. All other cathodically protected facilities that enter or cross ET's Pipeline Facility must have test leads installed. Any inquiries for cooperative testing should be directed to the attention of ET's Field Representative on location. Any Utility crossings that may be negatively affected by ET cathodic protection will need to be designed accordingly (i.e. coated, cased, etc.)
12. ET may require excavation of its Facilities to perform corrosion related tasks before and during foreign line crossings as required.
13. All underground utilities (other than residential telephone, cable TV and 24 volt DC power lines) may require plastic identification tape installed no closer than eighteen inches (18") above the line.

b. Water or Forced Sewer Lines

1. All water and sewer lines shall be either (1) ductile iron or steel casing (coated to protect it from ET's cathodic protection) or (2) steel encased in plastic schedule 80 PVC for a minimum of 5-feet on either side of any ET's pipelines or related Facilities or (3) standard PVC pipe.
2. Forced sewer lines shall have no piping connections located within 5-feet of any ET's pipelines or related Facilities or placed within ET's pipeline easement.

c. Communication, Power or Combustible Material Lines

1. When open trenching crossing with underground fiber optic cables, telephone and television cables (other than residential telephone and cable TV) crossing ET's Pipeline Facility shall be installed in rigid nonmetallic conduit with bags of concrete-mix placed directly above and below the conduit across company right-of-way or similar company approved method. Place warning burial tape the width of company right-of-way at least 18 inches (18") directly above communication cables.
2. When open trench crossing with underground electric cables except 24-volt DC power lines (including single residential service drops) crossing ET's facilities shall be installed in nonmetallic conduit with bags of concrete-mix placed directly above and below the conduit across company right-of-way or similar company approved method. A minimum of thirty-six inches (36") is required if over 600 volts. If it is necessary for a residential service drop to cross above ET Facilities, concrete bags are not required, only red caution tape for the full width of the ROW.
3. When underground electric cable over 10 kv is crossing ET Facilities it shall be a shielded cable installed in metallic casing with dielectric coating with bags of concrete-mix placed directly above and below the conduit across company right-of-way or similar company approved method. ET requires a minimum clearance of sixty inches (60") below ET's pipeline/facilities.
4. Any overhead crossing exceeding 160 kva must be reviewed by ET's corrosion department.
5. All overhead power/communication lines must cross ET Facilities with a minimum vertical overhead clearance of twenty-five feet (25') to grade at full load and maximum temperature.
6. ET recommends that all underground residential telephone, cable TV and 24 volt DC power lines be encased in plastic conduit for the full width of the right-of-way.

d. Exclusive Easement Construction

1. When constructing a directional drill across ET's easement a minimum separation of ten (10) feet must be maintained between the outside diameter of the bottom of ET's pipeline and the top of any of your facilities within ET's exclusive easement area.

2. When constructing a conventional bore across ET's easement a minimum separation of three (3) feet must be maintained between the outside diameter of the bottom of ET's pipeline and the top of any of your facilities within ET's exclusive easement area.

9. Proposed Roads, Streets, Driveways, Access Ways and Parking Lots

a. Load stress will be calculated by ET to determine if any protection of the pipeline is required for roadways, streets, driveways, access ways, etc., planned to cross ET's Pipeline Facility. In the event it is determined by ET that the roadways, streets, driveways, access ways, etc., will increase a risk to the public or increase a risk of a break, leak, rupture or other damage to ET's Pipeline Facility, ET may require, at the sole cost and expense of the party requesting such Crossing, the installation of protective material or pipeline adjustment as may be deemed necessary by ET to protect the public or ET's Pipeline Facility.

b. The preferred minimum earth cover over ET's Pipeline Facility is forty-eight inches (48") at all roadways, streets, driveways, access ways, etc., including adjacent ditch lines. In the event that ET determines that a lesser cover will not increase a risk to the public or increase a risk of a break, leak, rupture or other damage to the pipeline or related Facilities, ET may allow a lesser earth cover, in a minimum amount as determined solely within the discretion of ET. In the event the required amount of cover is not obtainable as reflected in finalized plan and profile drawings, ET may require the installation of protective material at no expense to ET. Cover shall be measured from the top of ET's pipeline to the surface of the road.

c. Roads and streets crossing over ET's Pipeline Facility shall cross at an angle of not less than forty-five degrees (45°), or as near as possible thereto. Crossings should be over straight pipe and at locations free of any crossovers. Longitudinal occupancy of the right-of-way will not be permitted.

d. No parking areas or the like will be allowed on, over or across ET's Pipeline Facility unless ET determines that the parking areas, etc. will not increase a risk or restrain access to its facilities, increase a risk to the public and/or increase a risk of a break, leak, rupture or other damage to the Facilities. The party requesting such crossing shall install, at its sole cost and expense, any protective material as deemed necessary by ET to protect the public or ET's pipeline facility.

e. Permanent pipeline marker(s), provided by ET, will be installed at all road crossings.

10. Disposal Systems

No aerobic septic systems, septic tanks, liquid disposal systems, or hazardous waste disposal systems will be allowed on ET's Pipeline Facility or within twenty-five (25) feet of ET's Pipeline Facility, unless otherwise agreed to in writing by ET. This will include, but is not limited to, affluent from sewage disposal systems, the discharge of any hydrocarbon substance, the discharge or disposal of any regulated waste, or any other discharge that may prove damaging or corrosive to ET's Pipeline Facility.

11. Impoundment of Water

a. In order to provide for the adequate maintenance and operation of ET's Pipeline Facility, the impoundment of water on ET's Pipeline Facility will not be allowed.

b. Temporary soil erosion and sediment control devices and storm water detention basins/traps will not be permitted on ET's Pipeline Facility unless otherwise agreed to in writing by ET.

12. Blasting & Seismic Activity

a. To the extent it impacts the lateral stability or otherwise endangers or interferes with the efficiency, safety, or convenient operation of ET's Pipeline Facility, no explosive detonations will be permitted within 300-feet of ET's Pipeline Facility without: (1) prior blast plan impact analysis and written approval from ET and (2) ET's representative on site during blasting. To determine if the detonation stresses will be detrimental to the safety of ET's Pipeline Facility, information required to complete ET's "Blasting Data Sheet" must be submitted to ET for evaluation and approval no less than 30 days prior to the proposed date of blasting activity. The contractor performing the blasting will be required to verify by signature the proposed blasting plan.

b. No "Non-Explosive" seismic testing or construction equipment with steady state vibrator, intermittent vibrator, or thumper sources shall be conducted within 150 feet of ET's Pipeline Facility without prior written approval.

13. Landscaping & Irrigation Systems

a. Landscaping shall not be permitted within ET's Pipeline Facility unless otherwise agreed to in writing by ET.

b. Irrigation heads and valves shall not be permitted within ET's Pipeline Facility unless otherwise agreed to in writing by ET.

c. Irrigation systems shall not be directly installed longitudinally over ET's Pipeline Facility and shall not be buried deeper than 12-inches, regardless of location, from the surface of the ground within ET's Pipeline Facility.

14. Pipeline Markers

The party request such Crossing will ensure that all temporary and permanent pipeline markers installed by ET are protected and maintained at all times during construction or Crossing related activity. Any permanent markers damaged or removed will be replaced by ET at the sole expense of the party requesting such Crossing. No work will be allowed to commence until, in the opinion of ET, sufficient pipeline markers are in place. Unauthorized damage or removal of pipeline markers is punishable by Federal law.

15. Right of Ingress and Egress

a. The party requesting such Crossing shall have the right to install fences on, over and across the Facilities, provided, however, that ET shall have the unrestricted right of ingress and egress to its Facilities at all times. Any fencing, except agricultural fence, must be approved in writing by ET. ET prohibits any fencing which obstructs access or line of sight for patrol/inspection or identification markers.

b. ET, at its sole option and discretion, may require the party requesting such Crossing to install, at its sole cost and expense and for ET's benefit, a walk gate at least three (3) feet in width for residential lots or gate at least twelve (12) feet in width for rural areas at each fence crossing. ET shall provide a lock for such gate(s). Said gate(s) shall be installed as to provide ET with ingress and egress access to its pipeline or related facilities and to minimize vehicular and equipment travel over ET's pipeline or Facilities.

c. The party requesting such Crossing shall be responsible for keeping the enclosed portion of ET's pipeline or related Facilities free of any debris or trash.

d. ET's pipeline or related Facilities shall be positively located by ET before any fences are constructed or installed near ET's pipeline or related Facilities. Post hole excavations for fencing placed upon ET's pipeline or related Facilities shall not be greater than a depth of

eighteen inches (18”) below the undisturbed grade level nor closer than five feet (5’) horizontally from ET’s pipeline or related Facilities, unless approved in writing by ET. No other excavations of any kind may be made in the pipeline or related Facilities without the prior written consent of ET.

16. Statement Regarding Existing Rights

NOTHING CONTAINED HEREIN SHALL BE CONSTRUED TO CONVEY, WAIVE, OR SUBORDINATE ANY OF ET’S EXISTING RIGHTS WHATSOEVER. SHOULD A CONFLICT EXIST WITH THE LANGUAGE CONTAINED IN ANY ET ENCROACHMENT AGREEMENT, EASEMENT, OR PETITION IN CONDEMNATION AND THESE GUIDELINES, ET’S ENCROACHMENT AGREEMENT, EASEMENT, OR PETITION IN CONDEMNATION SHALL CONTROL AND BE DECISIVE OF THE ISSUE.

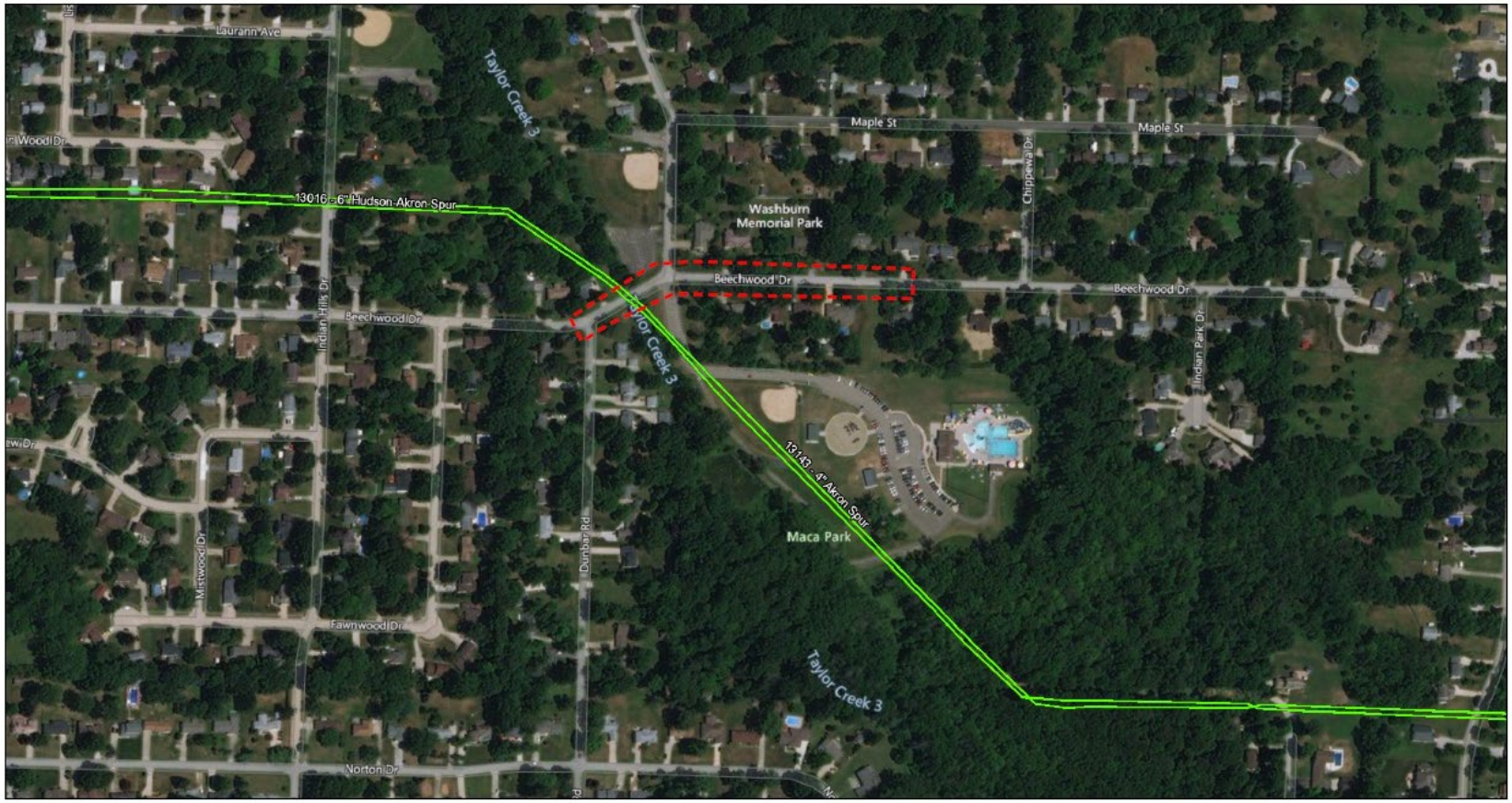
17. Statements Regarding Guidelines for Construction and Maintenance

Certain construction and maintenance activities may be reviewed and approved by ET at one point in time, but not immediately installed or performed. Therefore, all construction and maintenance activities are subject to the Guidelines in affect at the time the work actually takes place. In addition, the guidelines described in this document represent those industry standards that ET believes meet the minimum acceptable standards regarding third-party construction and maintenance activities in the vicinity of ET’s Pipeline Facility. Therefore, after review of the final plan and profile drawings, ET may, in the event that ET determines the construction and maintenance activities will increase a risk to the public or increase a risk of a break, leak, rupture or other damage to ET’s Pipeline Facility, require fortifications in furtherance of state codes. The party requesting such Crossing agrees to alter, modify or halt any construction activity, which in the sole opinion of ET’s, will increase the risk to the public or increase the risk of a break, leak, rupture or other damage to ET’s Pipeline Facility.

All written correspondences and your final design plans are to be addressed to:
Energy Transfer Company
Encroachments@energytransfer.com
Attention: Encroachment Department

Revised 4/18/19

Beechwood Dr.Waterline



February 19, 2021

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SCOPE OF BIDS
CITY OF TALLMADGE, OHIO
WATER SYSTEM IMPROVEMENTS
BEECHWOOD DRIVE WATER MAIN

BASE BID – DUNBAR RD. TO MACA DR.
ADD ALTERNAT 'A' – MACA DR. TO MACA PARK (OPEN-CUT)
AD ALTERNATE 'B' – MACA DR. TO MACA PARK (DIRECTIONAL DRILL)

It is understood and agreed that the CONTRACTOR has, by careful examination, satisfied himself as to the nature and location of the work; the conformation of the ground; the character, quality, and quantity of the materials to be encountered; the character or equipment and facilities needed preliminary to and during the prosecution of the work; the general and local conditions; and all other matters which can, in any way, affect the work under this Contract.

All known structures, pipelines, and utilities have been indicated in their approximate locations on the plans, and any reasonable variation in size and location of structures and pipe shall not be cause for extra payment.

Major deviations or modifications during construction, from that shown on, or the true intent of, the plans and specifications requiring more or less labor and materials shall be authorized by Change Order.

If construction procedures and equipment being utilized by the CONTRACTOR prove to be inadequate in the performance of the Contract, the procedures and equipment shall be modified or alternative equipment shall be furnished and used at no cost to the OWNER.

The CONTRACTOR will be responsible for obtaining and paying all costs associated with any telephone service he may require during the Contract period. The CONTRACTOR will be responsible for supplying, maintaining, and paying all costs associated with all temporary and permanent utility services as required for construction of the Work. The CONTRACTOR shall pay the monthly costs associated with electrical service throughout the Contract Time including testing and start-up until the project reaches substantial completion.

The price Bid shall include the following:

1. All labor, materials, and equipment in accordance with Article 6 of the General Conditions.

2. All field staking necessary for construction from control points established by the ENGINEER/ARCHITECT.

3. All assistance required by the ENGINEER/ARCHITECT to verify compliance with the Contract Documents, including measuring for quantities.

4. All audio-video color taping as specified.

5. All coordination, sequencing, permits, and traffic control.

6. All costs associated with permits, fees, and inspection.

All BIDDERS must Bid Items 1 through 16 inclusive.

Item 1 – Mobilization.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: mobilizing, demobilizing, storing, and staging equipment as required to perform the project; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications,

Payment will be made on a lump sum basis.

Item 2 – Pre-Construction Audio-Video Recording.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: pre-construction audio-video recording of all project areas, adjacent areas, and areas with the potential to be impacted by project activities; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications,

Payment will be made on a lump sum basis.

Item 3 – Maintenance of Traffic.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: maintaining traffic during the duration of the project; signs, lights, barricades, flaggers, portable traffic signals; coordination with and maintaining access for emergency and delivery vehicles, residents, businesses, and property owners; coordination with state, county, township, and village officials having jurisdiction over affected roads; MOT review submittals; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications,

Payment will be made on a lump sum basis.

Item 4 – Site Restoration/Grading/Seeding.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: grading, topsoil, fertilizer, seeding, mulch, mats, geotextile fabric; edging material, watering, to replace existing disturbed or damaged areas of work to a condition equal to or better than previously existed; furnishing, repairing, relocating, reinstalling, replacing all necessary plantings, bushes, trees, landscaping, fencing, signs, mailboxes, etc. necessary to address those items affected during construction with like material; coordination with property owners; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

Payment will be made on a lump sum basis.

Item 5 – Temporary Sediment & Erosion Control.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: maintain sediment and erosion control during the duration of the project within the project limits; permits, install, maintain, remove, temporary sediment and erosion controls; clean-up and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications,

Payment will be made on a lump sum basis.

Item 6 – PVC C909 Waterline (Open-Cut).
This item shall include all necessary materials, equipment, tools, and labor including but not limited to: utility verification; locating and staking of alignment; clearing; grubbing; stump removal; excavation; trenching; embankments; dewatering; sheeting; trench boxes; preparation of trench bottom; pipe and fittings; joint material; thrust blocking; temporary thrust blocking; concrete encasement; tracer wire and test stations; metallic locating tape; removal, repair, and replacement of drive culverts; restrained joints; pipe bedding; trench excavated material backfill; compaction; compaction testing; disinfection and testing; hauling and disposal of waste material; tree protection and trimming; repair and replacement of damaged utilities and utility service connections; repair and replacement of damaged drain lines/tiles; pavement saw cutting and removal; temporary pavement; dust, odor, and noise control; daily clean-up; connection to existing mains; cutting, plugging, and capping of existing mains; water main abandonment; water valve abandonment; utility pole support and restraint; sign removal and replacement; protection, removal, and restoration of landscaping; drainage feature restoration; coordination with Owner, Owner's representative, residents, businesses, and property owners; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

Payment will be made on a lineal foot basis as measured through fittings and valves from center to center of fittings and valves along the centerline of the water line, complete, tested, disinfected, and ready for service.

Item 7 – FPVC C900 Water Main (Directional Drilled).
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: horizontal directional drilling (HDD) installation of water mains; utility verification; locating and staking of alignment; clearing; grubbing; stump removal; excavation; pipe and fittings; drilling fluids; removal, hauling, and disposal of soil slurries; drilling fluid relief holes; tracer wire and test stations; conductors; testing backfill; disinfection and testing; repair or replacement of damaged utilities and utility service connections; daily clean-up; dust, odor, and noise control; connections to existing mains; replacement of pavement or other above ground areas damaged due to heaving and equipment; excavation pits required to connect water main ends; coordinating with utilities; pavement saw cutting and removal; temporary pavement; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

Payment will be made on a lineal foot basis as measured through fittings and valves from center to center of fittings and valves along the centerline of the directionally drilled water main, complete, tested, disinfected, and ready for service.

Item 8 – Cut-in Tees.
These items shall include all necessary labor, tools, equipment, and materials, and activities necessary to install the cut-in tees including, but not limited to: clearing; pavement saw cutting; pavement removal; excavation; rock excavation; embankments; dewatering; sheeting; trench boxes; preparation of trench bottom; trench backfill as required; compaction; tamping; pipe; joint material; pipe fittings; tees; solid sleeve couplings; restrained joints; blocking; concrete encasement; metal locators; zinc anode caps; granular bedding to 12- inches above the pipe; backfill; testing; disposal of waste material; cleaning up; disinfection and testing; dust; odor and noise control; traffic control; lights; signs and barricades; connections to existing/new water mains; ditch restoration; and all other expenses whether specifically mentioned or not.

Payment will be made at the unit price BID for each cut-in tee installed, complete.

Item 9 – Gate Valves.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: furnishing, installing, and testing gate valves and valve boxes complete; excavation, backfill; joint material; pipe; fittings; masonry units; spare wrenches; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

Payment will be made at the unit price bid for each valve and box installed.

Item 10 – Fire Hydrant Assembly.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: furnishing and installing fire hydrant complete; excavation, backfill; joint material; pipe; fittings; bends; tees; watch valve and box; masonry units; painting; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

Payment will be made at the unit price bid for each hydrant installed complete.

Items 11 and 12 – Service Connections.
These items shall include furnishing and installing service connections in accordance with the drawings and specifications. Include also in this item excavation; boring and/or jacking as necessary; copper pipe/tubing; fittings; service saddles; corporation stop; curb valve and box; meter pit and fittings; tapping of water main; backfill; grading and seeding; cleaning up; and all other necessary expenses whether specifically mentioned or not.

Payment will be made at the unit price BID for each service connection installed, complete.

Item 13 – Pavement Replacement.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: replacement of existing disturbed or damaged pavements as detailed on the plan sheets and specifications and when directed by the Owner/Engineer; continuous maintenance of all areas to be replaced, including temporary pavement, until permanent pavement is installed; and all other related work

and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

The area for payment shall be computed by multiplying the length of the disturbed area as measured along the centerline of the pipe, times the width of the disturbed area, but in no case shall the limits for payment on either side of the centerline of the pipe be greater than the following, unless otherwise depicted on the plan sheets:

*"Road Pavement" and "Concrete Drive" and "Asphalt Drive" Pavement Replacement

Waterline O.D./2 + 2'-0" *1'-0" shall bear on undisturbed soil

"Gravel Drive" Pavement Replacement

Waterline O.D./2 + 1'-0"

In case any pavement is damaged or disturbed outside of the above described pay limits, that pavement shall be replaced by the Contractor at no cost to the Owner.

Payment will be made for each pavement type at the unit price bid per square yard for the quantities as determined from the measurements specified above.

Item 14 – Concrete Curb Remove & Replace.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: removal and replacement of existing disturbed or damaged concrete curb as detailed on the plan sheets and specifications and when directed by the Owner/Engineer; continuous maintenance for 1 year of all areas to be replaced; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

The length of curb removal & replacement shall be measured along the length of the disturbed areas as measured along the front of curb, but in no case shall the limits for curb removal & replacement be more than 4'-0" or to the nearest joint beyond 4'-0" outside the disturbed area.

In case any curb is damaged or disturbed outside of the above described pay limits, that curb shall be replaced with the same type as included for payment, all at the Contractor's expense.

Payment will be made for curb removed & replaced at the unit price Bid per lineal foot of the quantities as determined from the measurements specified above.

Item 15 – Granular Backfill.
This item shall include all necessary labor, tools, equipment, materials, and activities including but not limited to: furnishing and placing of all granular backfill material necessary to backfill trenches as detailed on the plan sheets and specifications and when directed by the Owner/Engineer; compaction; testing; tamping; and all other related work and expenses whether specifically mentioned or not, required for the completion of the bid item(s) in accordance with the contract documents, plans, and specifications.

The volume for payment shall be computed by multiplying the length of the backfilled trench as measured along the centerline of the pipe, times the actual width of the trench at the top of the pipe barrel, but not to exceed the nominal pipe diameter plus 2 feet, times a height measured from the top of the pipe bedding to the top of the granular backfill.

In case any material is required to backfill the trench outside the above described pay limits, that granular backfill shall be provided by the Contractor at no cost to the Owner.

Payment will be made at the unit price bid per cubic yard for the quantities as determined from the measurements specified above.

Item 16 – Underground Utility Allowance.
This item shall include a bid allowance for miscellaneous work and activities beyond that identified in the Contract Documents, plans, and specifications, which could not have reasonably been known or identified at the time of bidding; and as identified and requested by the Owner/Engineer; Contractor shall submit a detailed plan and cost breakdown, including schedule to the Owner/Engineer for review and approval prior to purchasing items and performing work. The bid allowance amount will be adjusted by final adjusting change order at the conclusion of the project to reflect the final amount.

Payment will be made in accordance with the General Conditions.

BID FORM

PROJECT IDENTIFICATION: City of Tallmadge, Ohio
Water System Improvements
Beechwood Dr. Water Main Extension

THIS BID IS SUBMITTED TO: Office of Service Director
City of Tallmadge
46 North Avenue
Tallmadge, OH 44278

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Contract Documents to perform and furnish all work as specified or indicated in the Contract Documents for the amount Bid and within the time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of Section 00 11 13, "Advertisement for Bids," and Section 00 21 13, "Instructions to Bidders," including without limitation those dealing with the disposition of Bid security.

3. This Bid will remain subject to acceptance for 60 days after the day of Bid opening.

4. BIDDER will sign and submit the Agreement with the Bonds and the other contract forms as listed on the table of contents within 10 days after the date of OWNER's Notice of Award.

5. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   a. BIDDER has examined copies of all the Bidding Documents and of the following Addenda (receipt of all which is hereby acknowledged):

Date	Addendum Number(s)	Bidder Initials

b. This Bid is genuine and not made in the interest or on behalf of any undisclosed person, firm, or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization, or corporation; BIDDER has not directly or indirectly induced or solicited any other BIDDER to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm, or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other BIDDER or over OWNER.

6. BIDDER will complete the work for the following price(s):

BID SCHEDULE

CITY OF TALLMADGE, OHIO
WATER SYSTEM IMPROVEMENTS
SOUTH AVENUE WATER MAIN REPLACEMENT

BASE BID – DUNBAR RD. TO MACA DR.

BIDDER agrees to perform all the work described in the Contract Documents for the following unit prices:

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
1.	Mobilization	1	lump				
2.	Pre-Construction Audio-Video Recording	1	lump				
3.	Maintenance of Traffic	1	lump				
4.	Site Restoration / Grading / Seeding	1	lump				
5.	Temporary Sediment & Erosion Control	1	lump				
6.	8-Inch PVC C909 Waterline (Open Cut)	175	l.f.				
7.	8-Inch FPVC C900 DR 18 Waterline (Directionally Drilled)	265	l.f.				
8.	8-Inch x 8-Inch Cut-in Tee	2	ea.				
9.	8-Inch Gate Valve	3	ea.				
10.	Fire Hydrant Assembly	0	ea.	----	----	----	----
11.	1-Inch Service Connection – Short	0	ea.	----	----	----	----

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
12.	1-Inch Service Connection - Long	0	ea.	----	----	----	----
13.	Asphalt Roadway Pavement Replacement	25	s.y.				
14.	Concrete Curb Remove & Replace	20	l.f.				
15.	Granular Backfill	50	c.y.				
16.	Underground Utility Allowance	1	lump	----	----	$ 10,000.00	$ 10,000.00

BASE BID – DUNBAR RD. TO MACA DR.
BID SCHEDULE (Continued)

Informal Total of Bid Items 1 Through 16 $_____

Respectfully submitted:

Name of Contractor	Address
Signature	Date
Title	Phone Number

(Seal - if Bid is by a corporation)

Attest _____

BID SCHEDULE

CITY OF TALLMADGE, OHIO
WATER SYSTEM IMPROVEMENTS
SOUTH AVENUE WATER MAIN REPLACEMENT

ADD ALTERNATE 'A' – MACA DR. TO MACA PARK (OPEN-CUT)

BIDDER agrees to perform all the work described in the Contract Documents for the following unit prices:

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
1A.	Mobilization	1	lump				
2A.	Pre-Construction Audio-Video Recording	1	lump				
3A.	Maintenance of Traffic	1	lump				
4A.	Site Restoration / Grading / Seeding	1	lump				
5A.	Temporary Sediment & Erosion Control	1	lump				
6A.	8-Inch PVC C909 Waterline (Open Cut)	475	l.f.				
7A.	8-Inch FPVC C900 DR 18 Waterline (Directionally Drilled)	0	l.f.	----	----	----	----
8A.	6-Inch x 6-Inch Cut-in Tee	1	ea.				
9A.	6-Inch Gate Valve	1	ea.				
10A.	Fire Hydrant Assembly	2	ea.				

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
11A.	1-Inch Service Connection – Short	3	ea.				
12A.	1-Inch Service Connection - Long	4	ea.				
13A.	Asphalt Roadway Pavement Replacement	215	s.y.				
14A.	Concrete Curb Remove & Replace	10	l.f.				
15A.	Granular Backfill	160	c.y.				
16A.	Underground Utility Allowance	0	lump	----	----	----	----

ADD ALTERNATE 'A' – MACA DR. TO MACA PARK (OPEN CUT)
BID SCHEDULE (Continued)

Informal Total of Bid Items 1A Through 16A $_____

Respectfully submitted:

Name of Contractor	Address
Signature	Date
Title	Phone Number

(Seal - if Bid is by a corporation)

Attest _____

BID SCHEDULE

CITY OF TALLMADGE, OHIO
WATER SYSTEM IMPROVEMENTS
SOUTH AVENUE WATER MAIN REPLACEMENT

ADD ALTERNATE 'B' – MACA DR. TO MACA PARK (DIRECTIONAL DRILL)

BIDDER agrees to perform all the work described in the Contract Documents for the following unit prices:

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
1B.	Mobilization	1	lump				
2B.	Pre-Construction Audio-Video Recording	1	lump				
3B.	Maintenance of Traffic	1	lump				
4B.	Site Restoration / Grading / Seeding	1	lump				
5B.	Temporary Sediment & Erosion Control	1	lump				
6B.	8-Inch PVC C909 Waterline (Open Cut)	40	l.f.				
7B.	8-Inch FPVC C900 DR 18 Waterline (Directionally Drilled)	435	l.f.				
8B.	6-Inch x 6-Inch Cut-in Tee	1	ea.				
9B.	6-Inch Gate Valve	1	ea.				
10B.	Fire Hydrant Assembly	2	ea.				
11B.	1-Inch Service Connection – Short	3	ea.				

				Unit Prices in Figures			
(1) Item	(2) Description	(3) Quantity	(4) Unit	(5) Labor	(6) Material	(7 = 5 + 6) Total (Sum of Labor and Material)	(8 = 3 x 7) Total Extended Informal Price in Figures
12B.	1-Inch Service Connection - Long	4	ea.				
13B.	Asphalt Roadway Pavement Replacement	40	s.y.				
14B.	Concrete Curb Remove & Replace	10	l.f.				
15B.	Granular Backfill	25	c.y.				
16B.	Underground Utility Allowance	0	lump	----	----	----	----

ADD ALTERNATE 'B' – MACA DR. TO MACA PARK (OPEN CUT)
BID SCHEDULE (Continued)

Informal Total of Bid Items 1B Through 16B $ _____

Respectfully submitted:

_____
Name of Contractor | Address

_____
Signature | Date

_____
Title | Phone Number

(Seal - if Bid is by a corporation)

Attest _____

7. Unit prices have been computed in accordance with paragraph 11.03 of the General Conditions.

8. Quantities are not guaranteed. Final payment will be based on actual quantities as provided in the Contract Documents.

9. BIDDER agrees that the work will be complete and ready for final payment within 90 calendar days after the date when the Contract time commences to run, as provided in paragraphs 2.03 and 14.07 of the General Conditions.

10. BIDDER agrees to pay as liquidated damages (in the event of failure to complete the work ready for final payment within the times specified in the Agreement) the sum of $300.00 for each consecutive calendar day as provided in the Agreement.

11. The following documents are attached to and made a condition of this Bid:

    a. Required Bid Security in the form of_____.

    b. All the procurement forms listed in Section 00 01 09, "Table of Contents."

12. Communications concerning this Bid shall be addressed to:

    The address of BIDDER indicated below.

    _____ Phone_____

    _____ Fax _____

SUBMITTED on_____, 20___

If BIDDER is:

An Individual

By _____

(Individual's Signature and Typed Name)

doing business as _____

Business address: _____

_____

Phone No.: _____

A Partnership

By_____(SEAL)

(Firm Name)

_____

(General Partner Signature and Typed Name)

Business address: _____

_____

Phone No.: _____

A Corporation

By _____(CORPORATE SEAL)

(Corporation Name)

_____

(State of Incorporation)

By:

_____

(Typed Name and Signature of Person Authorized to Sign)

_____

(Title)

(Corporate Seal)

Attest

_____

(Signature of Secretary)

Business address:

_____

_____

Phone No.:

_____

Miscellaneous

Federal Taxpayer Identification Number

_____

LOCAL BIDDER PREFERENCECODIFIED ORDINANCE 143.06

The Board of Control, in determining the lowest and best bidder in the award of contracts to which this section is applicable, is authorized to award contracts to local bidders as hereinafter defined, whose bid isnot more than three percent (3%) higher, subject to a maximum amount of ten thousand dollars ($10,000.00), then the lowest dollar bid submitted by non-local bidders. The Board of Control's decisionin making such an award shall be final.

All contract specifications and/or bid documents that are distributed by Tallmadge for the purpose ofsoliciting bids for goods and/or services shall contain the following notice:

Prospective bidders will take notice that the City of Tallmadge, in determining the lowest and best bidderis the award of this contract, may award a local bidder preference to any qualified bidder pursuant to Section 143.06 of the Codified Ordinances of the City of Tallmadge. The determination of whether a bidder qualifies for the local preference shall be made by Board of Control. The Board's decision shall befinal.

Section III: TALLMADGE CODEIFIED ORDINANCE

Ordinance 49-2021

Presented by:
Director of Public Service Michael Rorar

AUTHORIZING THE DIRECTOR OF PUBLIC SERVICE TO ADVERTISE FOR BIDS AND THE MAYOR TO ENTER INTO CONTRACT FOR THE WATERLINE EXTENSION ON BEECHWOOD DRIVE AND PROVIDING FOR IMMEDIATE ENACTMENT

WHEREAS, it is necessary to maintain and repair the waterlines of Tallmadge.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF TALLMADGE, COUNTIES OF SUMMIT AND PORTAGE, STATE OF OHIO:

SECTION 1. That the Mayor, acting through the Director of Public Service, is hereby authorized to advertise for bids and to contract with the lowest and best bidder upon proper approval by the Board of Control for the installation of approximately 915 lineal feet of new 8-inch waterline installed, with all new fire hydrants, valves, new water services, and all other appertaining work necessary to complete the work along Beechwood Drive, in accordance with plans and specifications now on file in the office of the Director of Public Service.

SECTION 2. That such written contract shall be awarded under the provisions of Tallmadge Codified Ordinance Chapter 143, and shall be approved as to form and correctness by the Director of Law and proper certification of funds by the Director of Finance.

SECTION 3. That it is found and determined that all formal actions of this Council concerning and relating to the adoption of this ordinance were adopted in an open meeting of this Council, and that all deliberations of this Council and of any of its committees on or after November 28, 1975 that resulted in such formal action, were in meetings open to the public, in compliance with all legal requirements including Section 121.22 of the Ohio Revised Code.

SECTION 4. That this ordinance is necessary to provide for and to accomplish the purposes herein set forth, which are conducive to the health, safety, and welfare of the citizens of Tallmadge. For that reason, provided this ordinance shall receive the affirmative vote of three-fourths of the members of Council and approval by the Mayor, it shall be enacted immediately and shall be of immediate effect.

Passed: 4-8-21

Susan E. Burton, Clerk of Council
MER/jt/rc
4/1/21
Filed with the Mayor 4-9-21

Carol A. Kilway, President of Council

Approved:

David G. Kline, Mayor

This 9th day of April, 2021

Section IV: EQUIPMENT LIST

A listing of all the equipment to be used to fulfill the requirements of this contract must be submitted.

Equipment	Quantity	Year/ Age of:

Bidder attests that all equipment utilized during this contract is in good and serviceable condition. A City of Tallmadge Representative will inspect the equipment prior to the signing of the contract.

Authorized Signature Title Date

Section V: BIDDER REFERENCES

Complete the following information about Municipalities, which have been serviced by the contractor for similar work, within a 30 miles radius of the City of Tallmadge.

Municipality	Address	Contact:	Phone Number

NON-MUNICIPALTY REFERENCES / and CONTACTS

Company Name	Address	Contact:	Phone Number

Section VI: EXPERIENCE of MANAGEMENT/ SUPERVISORY PERSONNEL

Employees Name	Years with Company	Years Managed	Number of Employees Managed

Section VII: PREVAILING WAGE REQUIREMENTS

OVERVIEW
This project will utilize Ohio Prevailing Wage Rates. All contractors and subcontractors are required to comply with all Prevailing Wage Requirements in the Ohio Revised Code. The documents outlined below are contained in the following pages and will be utilized to comply with these requirements.

DOCUMENTATION REQUIREMENTS
The successful bidder will be required to submit all required documentation and certified payrolls per the requirements stipulated in Ohio Revised Code Chapter 4115 as work progresses to the City of Tallmadge Service Department.

PREVAILING WAGE AFFIDAVIT OF COMPLIANCE
This affidavit must be submitted to the City of Tallmadge Service Department before the surety is released or final payment is made.

PREVAILING WAGE RATES
Attached are the State of Ohio Prevailing Wage Rates as of the posting date of this bid. Actual rates due to workers will be those in affect at the time of work.

Payrolls
The Contractor must submit to the City of Tallmadge Service Department **original, certified, signed payrolls** containing the following information:

A) Name of each employee

B) Employees' social security numbers

C) Specific classification of employees (same as shown on wage determination or provisional approval).

D) Rate of pay not less than that shown on the wage determination.

E) Allowable fringe benefits paid to the employee.

F) Hours worked each day and total hours worked for each week for each employee.

G) Gross amount paid to each employee.

H) Itemized deductions for each employee.

I) Net amount paid to each employee.

J) The following certification:
"I certify that the payroll is correct and complete, that the wage rates contained therein are not less than the applicable rates contained in the Wage Determination decision of the Department of Industrial Relations, Prevailing Wage Rate Division, State of Ohio, and that the classifications set forth for each laborer or mechanic conform with the work he performs."

Prevailing Wage Affidavit of Compliance

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

Do hereby certify that the wages paid to all employees of_____
(Company Name)

for all hours worked on the_____
(Project and Location)

project, during the period from _____ to_____
(Project Dates)

are in compliance with State prevailing wage requirements.

I further certify that no rebates or deductions have been or will be made, directly or indirectly, from any wages paid in connection with this project, other than those provided by law.

_____
(Signature of Officer or Agent)

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

_____
(Notary Public)

The above affidavit must be executed and sworn to by the officer or agent of the Contractor or Subcontractor who supervises the payment of employees. This affidavit must be submitted to the owner (public authority) before the surety is released or final payment due under the terms of the contract is made

SECTION VIII: TECHNICAL SPECIFICATIONS

Bid, Contract, and Specifications

City of Tallmadge, Ohio

Beechwood Drive
Waterline Extension

October 2020

BURGESS & NIPLE
Engineers ■ Architects ■ Planners

SECTION 01 00 00

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **General.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Description.** The Contractor shall provide the labor, tools, equipment, and materials necessary to complete the work in accordance with the drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. **Codes and Standards**. Perform all work in compliance with current applicable requirements of governing agencies having jurisdiction.

B. **Testing Laboratory.** Engage a testing laboratory acceptable to the Engineer/Architect to perform inspection and tests when required.

1.4 SUBMITTALS

A. **General.** Furnish samples, manufacturer's product data, test reports, and materials certifications as required for materials and mix design when required.

B. **Notification.** The Contractor shall give the Engineer and the Owner 72 hours notice (excluding Saturdays, Sundays, and legal holidays) as to when the actual construction is to begin so that all affected parties may be notified. The notification shall include planned starting time and duration of interruption in service. The time and duration of the interruption of service must be approved by the Owner.

1.5 JOB CONDITIONS

A. **Work Limits.** All work performed and all equipment, materials, vehicles, etc., used to carry out the work, shall be kept within the existing easements and rights-of-way unless otherwise directed by the Owner. The Contractor shall adhere to all conditions of the existing easements and rights-of-way over which work must be performed.

B. **Safety.** The Contractor shall be solely responsible for complying with all federal, state, and local safety requirements together with exercising precautions at all times for the protection of persons (including employees) and property. It is also the sole responsibility of the Contractor to initiate, maintain, and supervise all safety requirements, precautions, and programs in connection with the work.

C. **Confine operations to areas** within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed. Limit use of the premises to construction activities in areas indicated.

D. **Keep driveways and entrances clear** and available to the property Owner 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.

E. **Burial of Waste Materials**. Waste materials shall not be buried within the project site.

F. **Site Investigation and Existing Conditions**. The Contractor shall visit the site to determine the conditions of the work and the present situation. A copy of the geotechnical report is included in Appendix A for use by the Contractor. Each Bidder shall familiarize themselves with the report and the existing conditions of the site prior to submitting their bid. The Contractor shall make any and all investigations necessary to include all costs required to accomplish the work described.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used.)

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS (Not applicable.)

PART 3 - EXECUTION

3.1 OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS

A. **Application**. The Construction and Material Specifications of the Ohio Department of Transportation (ODOT) current edition shall apply where noted on the plans and/or specifications. Each item or section referred to in the ODOT specifications shall have the same effect, application, and force as if produced in their entirety herein.

B. **Interpretation**. Notice should be taken that the ODOT specifications are to be used for the method of construction; installation, and acceptance of the referenced item(s); and that the unit of measure to be used for payment purposes may or may not correspond to that used by ODOT.

C. **Modifications**. Where a specification contained herein modifies the ODOT specifications or a section thereof, the modification shall prevail without altering the force and application of the remaining section of the ODOT specifications.

3.2 **PERMITS**. It shall be the Contractor's responsibility to pay for and obtain building and excavating permits. All permit costs and fees including construction deposits shall be borne by each Contractor.

3.3 **SITE EROSION CONTROL**. The Contractor shall provide site erosion control to prevent runoff water from the site to carry sand, silt, dirt, etc., into any storm sewer or

drainage channel. Method of control shall be presented in writing to the Engineer/Architect for review before proceeding with any excavation.

3.4 **SAFETY**. Safety requirements shall be in accordance with the General Conditions and the Occupational Safety and Health Act of 1970, U.S. Department of Labor. The Contractor is required to provide additional provisions for the safety of children in areas of work. These provisions require that the work area shall be fenced; and open excavations, open manholes or similar hazards shall not be left unattended. Excavations shall be secured at night and all equipment and supplies moved to a secured area.

3.5 **USE OF OWNER FORCES**. The Contractor shall provide all labor, services, materials, equipment, proper and necessary to complete the work required by the Contract. It is expressly understood and agreed by the Contractor as a part of this Contract that no Owner services, materials, equipment, labor or property shall be used for this project without the expressed written permission of the Owner. The Contractor shall reimburse the Owner for any and all such services, materials, equipment, and property used. The Contractor further agrees that such unauthorized use of Owner employees shall result in the immediate termination of this Contract.

3.6 **PROTECTION OF FACILITIES**. The Contractor shall exercise extreme caution within and adjacent to his work areas so as not to damage existing facilities. The Contractor shall assume all responsibility for the protection of any existing facility to remain in service. Any facilities that are damaged due to the Contractor's operations shall be repaired or replaced by the Contractor to original condition at no expense to the Owner.

3.7 **PROTECTION OF TREES**. Special attention shall be given to the trees which exist in the proximity of the proposed construction. The Contractor shall provide the labor, tools, equipment, and materials necessary to protect the integrity of each tree from damage during the performance of the contracted work. Any trees that are damaged due to the Contractor’s operations shall be repaired or replaced at no expense by the Contractor to the satisfaction of the Owner.

3.8 **NOISE, DUST, AND ODOR CONTROL**. The Contractor's construction activities shall be conducted to minimize all unnecessary noise, dust, and odors. The use of oil or other materials which may cause tracking shall not be permitted.

3.9 **CONSTRUCTION COORDINATION.** The Contractor shall coordinate the construction scheduling and construction activities with the Engineer and the Owner. See Section 01 14 00 for sequence of construction requirements.

3.10 UTILITIES

A. **Temporary Lighting and Construction Power**. The Contractor shall make arrangements with the electric power company to receive temporary lighting and construction power system at the construction site. Such system shall meet all requirements of the NEC, or any other state and local codes for temporary construction services. The temporary construction power system shall be a separately metered service derived from the utility and until final acceptance shall be paid for by the Contractor. The Contractor shall be responsible to install and remove any temporary power required during construction.

B. **Water**. The Contractor shall make his own arrangements to have water at the construction site for any required use. All costs for having water at the construction site shall be paid by the Contractor.

C. **Sanitary Facilities**. Suitable facilities for the use of all persons employed on the construction site shall be provided, maintained, and paid for by each Contractor. The sanitary conveniences shall be properly screened from public observation. The Contractor shall obey and enforce such other sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary by the Engineer/Architect and/or the Owner.

D. **Telephone**. The Contractor shall make his own arrangements to have adequate telephone service for himself and his subcontractors until completion of the Contract.

3.11 **SITE REPAIR.** The Contractor shall be responsible for restoring to its previous condition all site areas damaged during construction.

3.12 **PRESERVATION OF PROPERTY CORNERS AND SURVEY MARKERS.** The Contractor shall preserve all cornerstones, iron pins, monuments, or any other type of land monument. He shall have all land monuments in the proximity of the work referenced. He shall replace destroyed or damaged monuments and shall furnish a certification by a registered surveyor that the monuments have been restored.

3.13 CLEANUP

A. **Cleanup**. All waste, empty cans, and debris shall be removed from the site. None shall be allowed to accumulate.

END OF SECTION

SECTION 01 14 00

WORK RESTRICTIONS

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, materials, tools, and equipment necessary, temporary or permanent, required to construct the project and improvements in accordance with the drawings and specifications, including the work restrictions specified herein.

1.3 **QUALITY ASSURANCE** (Not used)

1.4 **SUBMITTALS. Submit the following** submittal package in accordance with the Division 1 Submittal Requirements.

A. Submittal Package No. 1 – Written Notice

1. Schedule. Submit a written notice 72 hours in advance of any cut-in that requests consent to proceed, including:

   a. Identification of project.
   b. Description of affected work and work areas of the facility.
   c. Effect on other work and on structural integrity and safety of the project.
   d. Description of the proposed work including:

      1) Scope of connection.
      2) Contractor and trades to execute work.
      3) Products proposed to be used.
      4) Extent of refinishing.
      5) Schedule of operations including required downtime for any of the Owner's facilities, starting time, duration, and completion.

1.5 JOB CONDITIONS

A. **General Requirements**. It is imperative that existing facilities remain functional during the construction to the extent that the present (preconstruction) facilities will not be reduced unless noted otherwise in the Contract Documents.

B. **Construction Staging Area**. Storage of equipment and materials for construction shall be limited to the staging area. The Contractor shall prepare and submit to the Engineer a site plan showing the proposed construction staging area.

C. Coordination

1. The General Contractor shall coordinate the work of all subcontractors, crafts, and trades engaged in the work.
2. The General Contractor will coordinate the work of all the Prime Contractors on-site.
3. The General Contractor shall develop and have final responsibility with respect to coordination of the work in developing and enforcing the schedule.

D. Site Accessibility

1. Keep driveways and entrances clear and available to the Owner at all times.
2. Do not use these areas for parking or storage.
3. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

E. Noise, Dust, and Odor Control

1. Conduct all construction activities to minimize all unnecessary noise, dust, and odors.
2. Do not use oil, or other materials which may cause tracking, to control dust.

F. Specific Requirements

1. Meet with the Engineer/Architect and Owner to determine which systems or facilities must be maintained in use or operation and to determine the acceptable timing of shutdowns.
2. The Owner has the authority to stop or prohibit work which would interfere with or jeopardize the continuous operation of the facility.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 **GENERAL**. The Contractor shall prepare and provide the Owner and Engineer/Architect the following products:

A. **Project Construction Schedule**. The Contractor, and in the case of multiple contracts, all Contractors shall jointly prepare a projected construction schedule in the form of a horizontal bar chart.

B. **Revised Construction Schedule**. A revised construction schedule incorporating any changes resulting from the schedule review.

C. **Updated Construction Schedule**. Updated projected construction schedule as the work progresses. Updating would reflect changes in the schedule due to changes in scope, materials delay, or abnormal weather conditions.

D. **Written Sequence of Construction**. An overall written sequence of construction.

E. **Proposed Methods of Construction**. The proposed methods of construction including excavation equipment, storage of material, and disposal of excess material.

F. **Construction Staging Area**. A site plan of the project site showing the location of storage and activity plan during construction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Verification

1. Confirm all requirements, conditions, dimensions, and time intervals prior to beginning actual construction in any given area.
2. Confirm that the conditions have not changed since preparation, submission, and approval of the shut down plan.
3. Notify the Owner and Engineer/Architect prior to commencing the connection if the proposed work is incompatible or incomplete.

3.2 PREPARATION

A. **Safety**.

1. All required or appropriate safety measures, methods, devices, or equipment shall be available and in place prior to beginning any construction.

B. **Permits**. All required permits and approvals shall be on-site at the time of beginning construction.

3.3 REQUIREMENTS

A. Sequences and Interferences

1. Since alterations, additions, and tie-ins are included in this work that potentially could interfere with the existing facilities' function, take any and all steps necessary to avoid this interference.

2. Only the City shall operate the City’s valves.

3. Complete as much work as possible before making tie-ins or switchovers.

4. Install and start-up new components prior to removal of the existing components from service.

5. Install and maintain temporary parallel components until service is restored.

6. When interferences are unavoidable by the above methods, take the following additional steps:

   a. Schedule the work so as to minimize the time interval and/or frequency that any critical facility or component is out of service.

   b. Coordinate all labor, materials, and equipment to be on the site at the start of a shutdown.

   c. Work continuously (24 hours per day, 7 days per week) until service is restored.

   d. Schedule the work to correspond with minimum demands on any system or facilities. This may include weekend or evening work.

   e. Notify the Owner in writing 72 hours in advance of a shutdown so that the Owner can make the necessary preparations.

      1) Signed Notice. Each written notice must be signed by the Owner and Engineer/Architect prior to the start of work.
      2) Notify all utility companies whose equipment and facilities are directly involved with the proposed work prior to the start of work. Coordinate all work with the utility companies.
      3) Notify the Owner when connection has been completed and normal operations can resume.

B. **Coordination**. Coordinate and schedule the activities of subcontractors and utility work forces with the Owner. The following list of interconnections and sequencing requiring special coordination is provided for the Contractor's convenience. Do not consider this list complete; any omissions of interconnections or sequencing from this list shall not relieve the Contractor of his responsibility.

1. Each Contractor and subcontractor shall coordinate installation of materials and equipment so as to not interfere with the work of other Contractors or subcontractors. Where interferences are anticipated, they shall be brought to the attention of the General Contractor for resolution, which shall be subject to approval by the Engineer/Architect.

2. Each Contractor and subcontractor shall locate and install embedded materials before concrete is poured and shall do so as directed by the General Contractor and shown in an approved shop drawing.

3. No extra compensation will be allowed to cover the cost of removing piping, conduit, ducts, etc., or equipment due to a lack of coordination or communication between Contractors and subcontractors.

4. Each Contractor or subcontractor shall be responsible for coordinating and scheduling the activities of their subcontractors and utility work forces with the General Contractor.

5. Maintain all approved schedules, sequences of construction, copies of communications of all coordination, and other information as required at the construction site.

6. Designate a single point of coordination in one responsible individual.

C. **Existing Units**. The Owner's personnel shall operate all existing valves, gates, and equipment required for the work to be completed.

3.4 DEMONSTRATION

A. **Records and Responsibility**. The Contractor shall maintain all approved schedules, sequences of construction, copies of communications of all coordination, and other information as required at the construction site. A single point of coordination shall be designated in one responsible individual by the Contractor.

END OF SECTION

SECTION 01 31 19.01

PROJECT MEETINGS

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **General**. Provide the labor and materials necessary to attend and participate in project meetings in accordance with the plans and specifications.

B. **Conferences and Meetings**. This section specifies administrative and procedural requirements for project meetings including but not limited to:

1. Preconstruction conference.
2. Progress meetings.

1.3 **QUALITY ASSURANCE** (Not used)

1.4 **SUBMITTALS** (Not used)

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 PRECONSTRUCTION CONFERENCE

A. **Schedule**. The Engineer/Architect will schedule and conduct a preconstruction conference and organizational meeting at the project site or other convenient location after execution of the agreement and prior to commencement of construction activities. No work shall commence prior to the meeting.

B. **Attendees**. The Owner, Engineer/Architect and their consultants, the Prime Contractors and their superintendents, 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. Site safety.
13. Security.
14. Housekeeping.
15. Working hours.
16. Others as appropriate.

D. **Minutes**. Within 7 days of the preconstruction conference, the Engineer/Architect will distribute minutes to all attendees.

3.2 PROGRESS MEETINGS

A. **Schedule**. The Engineer/Architect will conduct progress meetings at the project site on an as needed basis.

B. **Attendees**. In addition to representatives of the Owner, Engineer/Architect, and all Prime Contractors, 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.

C. **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.

1. Contractor's Construction Schedule.

    a. Review progress since the last meeting.
    b. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead of or behind schedule.
    c. Determine how construction behind schedule will be expedited.
    d. Secure commitments from parties involved to do so.
    e. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the contract time.

2. Review the present and future needs of each entity present, including such items as:

    a. Interface requirements.
    b. Completion times.
    c. Preferred sequences.
    d. Delivery schedule.

e. Off-site fabrication problems.
f. Access issues.
g. Site utilization.
h. Temporary facilities and services.
i. Hours of work.
j. Hazards and risks.
k. Housekeeping.
l. Quality and work standards.
m. Change Orders.
n. Documentation of information for payment requests.

D. **Schedule Updating**. The General Construction Contractor shall revise the construction schedule after each progress meeting where revisions to the schedule have been made or recognized and submit the revised schedule within 3 days of each progress meeting for distribution with the minutes.

E. **Minutes**. Within 7 days of the progress meeting, the Engineer/Architect will distribute minutes to all attendees.

END OF SECTION

SECTION 01 32 34

PRECONSTRUCTION AUDIO-VISUAL RECORDING

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to furnish the audiovisual recording in accordance with the drawings and specifications.

1.3 QUALITY ASSURANCE

A. **Codes and Standards**. Perform all work in providing the audiovisual recording in compliance with applicable requirements of governing agencies having jurisdiction.

1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

A. Submittal Package No. 1 – Sample DVD

1. At the start of the recording, submit a sample DVD of a portion of this project. No taping shall occur before the sample DVD is approved.

B. Submittal Package No. 2 – DVDs and Logs

1. DVD Log. Provide a log that accurately catalogs the contents of each DVD in an acceptable manner. Information in the DVD logs will include the following:

    a. Street name, easement, or address.
    b. Sheet number or numbers relative to the line entry of a particular area of coverage.
    c. DVD numbers.
    d. Real-time code indexing for each segment of the project. Real-time code indexing will indicate 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 (project title, Owner, date, location).

2. DVD. Label all DVDs with project information in an acceptable manner. Cross reference the information on the labels with the DVD logs. Information on labels shall include the following:

a. DVD number.
b. Project title.
c. Location of project.
d. Month and year of coverage.
e. DVDs must be marked as sets (Engineer set, Owner set, Contractor set).
f. Quick reference list of the contents of the DVD.

1.5 JOB CONDITIONS

A. **Recording**. Record each area and submit DVDs before mobilization begins. All recording shall be witnessed unless waived in writing.

B. **Visual Inspection**. Prior to recording, investigate all areas visually with notation made of features not readily visible by recording methods. This would include, but not be limited to, culverts (size, type, condition) and manholes that may be partially buried. Record all measurements made during the inspection.

1.6 DELIVERY, STORAGE, AND HANDLING (Not used)

1.7 SPECIAL WARRANTY (Not used)

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. **DVD**. DVDs shall be original, previously unrecorded, blank DVDs. If duplicate copies are required by the Owner, all copies shall be limited to direct copies of the original DVD and marked as such.

B. **Camera/Camcorder**. The camera/camcorder shall have the following features:

1. Color.
2. High-resolution, digital recording.
3. 1/4-inch, 1/3-inch, or 1/2-inch charged coupled device imaging systems.
4. Optical Stabilization. No electronic stabilization.
5. 20X minimum optical magnification.
6. NTSC 525 lines resolution/60 fields/30 frames per second.
7. Minimum illumination capabilities of at least 3 lux.

C. **Portable DVD Player**. The portable DVD player, when used in conjunction with a separate color video camera, shall be alternating current (ac) or battery operated.

D. **Wheeled Vehicles**. Clearly mark vehicles used for recording purposes with company's name and telephone number. Vehicles shall incorporate signs, flaggers, and lights as needed for safety purposes.

PART 3 - EXECUTION

3.1 VIDEO INFORMATION

A. **Audio**. Begin each DVD with an audio tract that includes the current date, project name, municipality, and general location, i.e., name of the street or property owner; location of cross county line; viewing side; and direction of progress. Note the engineering stationing (where required) on the audio track. Identify houses and buildings audibly by an address when available.

B. **Date and Time**. Display the month, day, year, hours, minutes, seconds, and location on all video recording.

C. **Stationing/Positioning**. Stationing must be continuous and accurate and reflect the stationing within the field of view. The stationing must coincide with stationing on project plans and utilize standard engineering notation (10+00). Global positioning system (GPS) may be used with or in place of engineering stationing. Differential GPSs are to be used where available, with updates one per second at 5-meter or less spherical accuracy. Standard GPS accuracy is as dictated by United Sates Department of Defense mandate. GPS display will be at 1-meter-longitude and 1-meter-latitude increments (4032 N 639) (08216 W 401).

3.2 COVERAGE

A. **General**. Recording shall include, but not be limited to:

1. Existing pavement.
2. Driveways.
3. Sidewalks.
4. Curbs.
5. Ditches (drainage patterns are of particular concern).
6. Streets (including condition of paving for full width).
7. Landscaping.
8. Shrubs.
9. Trees.
10. Culverts.
11. Catch basins.
12. Headwalls.
13. Fences.
14. Visible utilities.
15. All buildings (interior and exterior) located within the zone of influence of construction. Of particular concern are existing faults, fractures, defects, or other imperfections.

B. **Streets**. Record streets and street areas for the full width of the zone of influence of construction, including both sides of the street. The term "street" shall be understood to mean street, highway, avenue, boulevard, road, alley, lane, driveway, parking lot, etc., and all adjacent areas within the possible zone of influence of construction.

C. **Easements**. Record easements for the full width of the permanent and temporary easements and all other adjacent areas lying within the zone of influence of construction. Easement means all areas not in streets that require record coverage. Include in this coverage any areas that are intended to be used for construction access, storage, or waste disposal.

3.3 RECORDING CONDITIONS

A. **Visibility**. Record during times of good visibility. Do not record outside during the following conditions unless otherwise authorized:

1. Darkness.
2. During periods of visible precipitation.
3. When the ground area is covered with snow, leaves, or debris.

B. **Lighting**. In order to produce the proper detail and perspective, use adequate auxiliary lighting to fill in shadow areas, utility poles, road signs, and other such objects, as well as other conditions requiring artificial illumination.

C. **Rate of Speed**. Do not exceed an average rate of speed of 50 feet per minute during recording. Panning rates and zoom-in/zoom-out rates shall not exceed 10 percent over a 3-second interval.

D. **Distance**. When conventional wheeled vehicles are used for recording, the minimum distance from the camera lens to the ground shall be 8 feet.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Provide all labor and materials necessary to furnish the following submittals as required by each individual section of the specifications.

1. Shop drawings.
2. Product data.
3. Samples/mock-ups.
4. Operation and Maintenance (O&M) manuals.
5. Personnel qualifications.
6. Source quality control documents.
7. Material field test reports.
8. Product/material certifications.
9. Special warranties.
10. Project record documents.
11. Others (as specified in the individual technical specifications).

1.3 **QUALITY ASSURANCE** (Not used)

1.4 SUBMITTALS

A. **General**. Submit all submittals in accordance with the requirements within this specification section.

B. Submittal Package No. 1 – Submittal Schedule

1. Submit a submittal schedule according to paragraph 2.05 of Section 00 70 00, "General Conditions."

   a. This schedule shall include all submittals (including all Prime Contractors' submittals) that are required to be used on the project, and the date of submittal to the Engineer/Architect.

   b. Include in schedule a milestone for notification of the Engineer/Architect prior to field-verifying operation and maintenance manuals.

   c. Submittals requiring multiple submissions shall include multiple listings on the documents.

   d. The Engineer/Architect will review the list and make any necessary comments.

e. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

f. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently.

g. Multiple Prime Contracts. Allow time in schedule for all submittals to go through the Prime General Contractor for coordination purposes before they are forwarded to the Engineer/Architect.

h. Processing. Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals, depending upon the complexity of the submittal.

1) Allow 2 weeks for processing each submittal.
2) No extension of the Contract Time will be authorized because of failure to transmit submittals to the Engineer/Architect sufficiently in advance of the work to permit processing.

1.5 **JOB CONDITIONS** (Not used)

1.6 DELIVERY, STORAGE, AND HANDLING

A. **Store and protect large samples and mock-ups** until the Project is completed, then properly dispose of off-site.

B. **Maintain and make available** to the Engineer/Architect, at the job site, a complete file of all approved submittals as part of the project record documents.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 SUBMITTAL TRANSMITTAL

A. **Transmit each submittal** from the Contractor to Engineer/Architect using a transmittal form. Include the following on the transmittal form.

1. Relevant information and requests for data.
2. Deviations from Contract Document requirements, including minor variations and limitations.
3. The specification section number.
4. Other pertinent information to identify the items being submitted.

2.2 GENERAL REQUIREMENTS FOR SUBMITTALS

A. **Originals**. The Contractor, the subcontractors, or suppliers shall generate submittal information. No reproductions of partial (or complete) versions of the plans, sections, details, schematics, specification pages, etc., from the Contract Documents are acceptable.

B. **Complete Submittals**. Clearly describe the equipment to be furnished with complete and detailed submittal information.

C. **Identification**. Properly identify all submittal-related documents and arrange in a logical order to best present the information. Provide an index that includes the following on every submittal.

1. Manufacturer's name and address.
2. Submittal date and revision number, if applicable.
3. Contract identification and specification section.
4. Drawing scale and orientation.
5. Submittal page number or sequence of pages.
6. Drawing number.

D. **Verification**. Where existing conditions or structures exist, field-verify dimensions, elevations, clearances, etc. The submittal shall not be accepted for review until such verified data is clearly indicated.

E. **Legends**. All submittal diagrams, drawings, schematics, etc., shall include complete keys, legends or similar explanation as to the graphics, and symbols and abbreviations used. In general, all graphics, symbols, abbreviations, and equipment nomenclature used for a submittal shall duplicate those used on the Contract Drawings.

F. **Approvals**. Provide the following on each submittal.

1. A space approximately 4" x 5" on to record the Contractor's review and approval markings and the action taken. These shall include the Contractor's:

    a. Approval stamp.
    b. Signature.
    c. Date of approval.
    d. Deviations from the Contract Documents.

2. An equal area beside the Contractor's review and approval markings for the Engineer/Architect's review stamp.

G. **One Section per Submittal**. Each submittal shall pertain to only one specification section.

H. **All submittal information shall be**:

1. Neatly arranged.
2. Legible.
3. Not distorted or faded.
4. English.
5. In United States standard units.
6. Typed.

I. **All letters, certifications, and similar documents** shall be submitted in their entirety. Single pages of multiple-page letters, or letters with deleted passages will not be acceptable for submittal purposes.

J. **"Generic" letters, test reports**, material certifications, or similar documents which do not specifically address the requirements of the Contract Documents for the actual materials being furnished will not be acceptable.

K. **Mark all submittals** to clearly indicate the full extent of the equipment to be furnished.

1. Indicate all options to be provided, materials of construction, dimensions, and other information pertinent to the submittal.
2. Options, materials, and dimensions which do not pertain to the materials or equipment to be furnished shall be neatly marked out so as to avoid confusion and doubt during review, delivery, and installation.

L. **Resubmittals must clearly identify** all changes and revisions. Mark the drawing "revised" with the revision date indicated. Each resubmittal shall reference the previous submittal by the Engineer/Architect's log number.

M. **"By Others."** All submittals are reviewed as if prepared by the Prime Contractor. The term "By Others" is appropriate to indicate supply by the Owner or another Prime Contractor. Where a subcontractor or supplier uses the term "By Others" to indicate work by the Prime Contractor or another subcontractor or supplier, the Prime Contractor shall change "By Others" to indicate the actual source.

N. **Deviations from Contract**. Highlight, encircle, or otherwise indicate deviations from the Contract Documents in all submittals.

2.3 SPECIFIC SUBMITTAL-TYPE REQUIREMENTS

A. **Shop Drawings**. The following paragraphs detail the general requirements for shop drawings and specific requirements for specific types of shop drawings.

1. General Requirements.

a. A shop drawing is a detailed representation of the work to be performed to demonstrate compliance with the Contract Drawings including:

1) Material and equipment layout.
2) Fabrication drawings.
3) System and electrical schematic diagrams.
4) Equipment and material schedules.
5) Installation details.

b. Submit newly prepared information, drawn to accurate scale.

c. Standard information prepared without specific reference to the project is not considered shop drawings.

2. Equipment/Material Layout Drawings.

a. Include:

1) Plot plans.
2) Plant site maps.
3) Equipment location plans.
4) Equipment and material layout plans and sectional views.
5) Connection detail drawings.
6) Similar drawings showing the incorporation of materials and equipment into the work.
7) The physical layout to scale, including elevations, plant grid coordinates, dimensions to new/existing structures, and other items of the work.
8) Dimensions.
9) Labeling.
10) Notes.
11) Legends.
12) Bills of materials.
13) All other information required to graphically describe the proposed work.

B. **Product Data**. Product data is submittal information that fully describes the item to be incorporated into the work. Product data shall include when applicable:

1. Manufacturer name.
2. Catalog cut-sheets.
3. General descriptive bulletins/brochures/specifications.
4. Materials of construction data and parts list.
5. Finish/treatment data.
6. Equipment/material weight/loading data.
7. Engineering design data, calculations, and system analyses.
8. Digital system documentation.
9. Any deviations from the contract documents.
10. Material Certifications. These include signed certificates or declarations by the Contractor, supplier, manufacturer, testing laboratory, or recognized certification agency which document that materials and

product composition or construction comply with specified requirements and stated reference standards.

11. Manufacturer's printed recommendations.
12. Compliance with recognized trade association and testing agency standards.
13. Application of testing agency labels and seals.
14. Notation of dimensions verified by field measurement.
15. Notation of coordination requirements.
16. Specific response to detailed specification requirements.
17. Maximum operating pressure and temperature ratings.
18. Other information specifically called for under the sections of Divisions 1 through 33 shall be included in this category.

C. Samples or Mock-Ups

1. Samples. Samples are portions of or complete units of the precise article proposed to be furnished.
2. Color and Pattern Charts. When the precise color and pattern are not specifically prescribed in the Contract Documents, or when the Contract Documents require that a product be furnished in a color or pattern directed by the Owner or Owner's Representative, submit accurate color charts and pattern charts of the available ranges for review and selection.
3. Mock-Ups. Build mock-ups with full-size products to match the scale of the proposed construction to demonstrate compliance with specified requirements and construction standards.

D. O&M Manuals

1. General.

   a. Bind each copy in an appropriately sized three-ring notebook a cover designating the name of equipment, maintenance, and specification section number.
   b. Bind operation and maintenance instructions for each specification section in a separate notebook.

2. Required Information. Include the following information to provide with a description of the incorporation of the equipment into the work and with functional data to evaluate equipment operation.

   1) Installation, routine preventive maintenance, troubleshooting, and lubrication instructions.
   2) Procedures for moving, supporting, and anchoring of equipment, including tolerances for settings and adjustment.
   3) Storage requirements to protect products prior to installation and during periods of prolonged shutdown.
   4) Storage requirements of extra materials.

   a. Parts List. Include assembly, exploded-view illustrations, or sectional drawings with all parts identified. Also include

descriptions, quantity (per assembly) required, and original equipment manufacturer's part numbers.

b. Supplier Data. Provide addresses, telephone numbers, and names of contact persons for equipment manufacturer and manufacturer's representative. Include both regional (local) and home offices.

c. Warranties and Guarantees. Include copies of the approved draft warranties in the initial operation and maintenance manual submittal. Following substantial completion, provide copies of the executed final warranties for insertion into the final operation and maintenance msnusld.

d. Approved Submittals. Provide a complete list (including submittal numbers) of all approved submittals pertaining to the operation and maintenance instructions.

e. Copies of all materials shipped with the equipment.

f. Copies of all approved submittals including control wiring diagrams.

E. Personnel Qualifications

1. General. These qualification statements and information pertain to personnel and entities employed in the prosecution of the work.

2. Specific Information. Provide the following information regarding the proposed personnel or entity.

a. Education/training.
b. Company employment history.
c. Professional experience.
d. References.
e. Certifications or licenses.

Stated qualifications shall be pertinent to the specific task for which qualifications are requested.

F. Source Quality Control Documents

1. Inspection. Inspection data includes inspection procedures and results of factory inspections of products, equipment, or systems. Within this type of submittal information are factory witness test procedures, schedules and reports, and similar data.

2. Testing. Test data is the information leading to or resulting from tests performed on materials, equipment, or systems at the manufacturer's facilities or in testing laboratories. This also includes data on testing equipment. Examples of test data include all information, test

arrangement, drawings, illustrations, diagrams, curve plots, graphs, and other data which substantiates or establishes a material or product characteristic, quality, or other trait as a result of test required by the Contract Documents.

G. Material Field Test Reports

1. Report Data. Written reports of each inspection, test, or similar service shall include, but not be limited to:

   a. Date of issue.
   b. Project title and number.
   c. Name, address, and telephone number of testing agency.
   d. Dates and locations of samples and tests or inspections.
   e. Names of individuals making the inspection or test.
   f. Designation of the work and test method.
   g. Identification of product and specification section.
   h. Complete inspection or test data.
   i. Test results and interpretations of test results.
   j. Ambient conditions at the time of sample taking and testing.
   k. Comments or professional opinion as to whether inspected or tested work complies with Contract Document requirements.
   l. Name and signature of laboratory inspector.
   m. Recommendations on testing.

2. Example reports covered by this paragraph include compaction tests and concrete, leakage, and disinfection tests.

H. Special Warranties

1. There are two general types of warranties covered by this specification.

   a. Manufacturer's Express Warranties.

      1) These are formal statements of certifications by manufacturers which warrant to the Owner that products and equipment are free from defects in material and workmanship.
      2) These are standard warranties issued with products and equipment which supplement the Contractor's warranty and may also extend coverage past the expiration of the Contractor's warranty.
      3) Include with the manufacturer's warranty data shall be a notification of the availability of an extension to the standard warranty including terms.

   b. Special Express Warranties.

      1) The form, format, and conditions of special warranties are described in the various specification sections of the Contract Documents.

2) These are formal warranties above and beyond the Contractor's warranty and manufacturer's standard warranties.
3) These warranties may be based on performance, power consumption, maintenance projects, or other operating parameters.
4) Extended warranties, service contracts, and performance bonds are also included under this category.

2. Term or Period. Unless otherwise established by individual sections in Divisions 2 through 33, all Contractor express warranties shall extend for 1 calendar year from the date of substantial completion of the project or acceptance date of the product or portion of work thereof, whichever is the later date.

3. Content of Warranty. The warranty shall contain, as applicable:

a. Effective starting date of the warranty period.
b. Statement of the terms and conditions of the warranty, if any.

I. Project Record Documents

1. Project record documents are to be in accordance with paragraph 6.12 of Section 00 70 00, "General Conditions."

2. Record Contract Drawings. Legibly mark contract drawings to record actual construction including:

a. Depths of various elements of foundation in relation to data.
b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
d. Field changes of dimension and detail.
e. Changes made by change order or field order.

J. Extra Materials/Spare Parts

1. Coat or package extra materials to prevent corrosion or deterioration during long-term indoor storage.

2. Clearly label all packaging with:

a. Part name.
b. Part number.
c. Associated equipment name and number.
d. Manufacturer's name and address.
e. The required storage environment for the materials.

K. **Other**. These include special tools/repair parts list, photographs, videos, certificates, construction schedules, drawings, reports, meeting minutes, data, and information required by the Contract Documents which do not logically fall into the submittal types defined above.

PART 3 - EXECUTION

3.1 SUBMITTAL PREPARATION AND TRANSMITTAL

A. Coordination

1. Coordinate preparation and processing of submittals with performance of construction activities.
2. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay and in accordance with the submittal schedule.
3. The General Contractor is responsible for resolving any disputes between Prime Contractors over submittals.

B. Verification

1. Verify the correctness and completeness of all submittals prior to forwarding same for review.
2. All submittals shall comply with the Contract Documents.

C. **Package each submittal** appropriately for transmittal and handling including a transmittal form.

D. **The Prime General Contractor shall submit** the minimum number of submittals as listed in paragraph 3.3 of this specification.

E. **Submittals received from sources** other than the Prime General Contractor will be returned without action.

F. **Other Prime Contractors shall submit** all submittals through the Prime General Contractor.

3.2 ENGINEER/ARCHITECT'S REVIEW AND ACTION

A. General

1. Except for submittals for record, information, or similar purposes where action and return is not required or requested, the Engineer/Architect will review each submittal, mark to indicate action taken, and return promptly.
2. Cost to review any submittal more than twice will be deducted from Contractor's monthly estimates and final payments.
3. The Engineer/Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. **Action Stamp**. The Engineer/Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate action taken.

1. Final Unrestricted Release. Where submittals are marked "Approved," that part of the work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Final-but-Restricted Release. When submittals are marked "Approved as Noted," that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

3. Returned for Resubmittal.

   a. When submittal is marked "Not Approved" and/or "Revise and Resubmit," do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity.
   b. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   c. Do not permit submittals marked "Not Approved" and/or "Revise and Resubmit" to be used at the project site or elsewhere where work is in progress.

3.3 MINIMUM NUMBER OF SUBMITTALS AND DISTRIBUTION

A. **After a submittal has been approved**, the Engineer/Architect will make the following distribution:

	Submittal	Minimum No. of Submittals	Distribution		
			Owner	Contractor	Engineer/ Architect
1.	Shop Drawings	7	1	4	2
2.	Product Data	7	1	4	2
3.	Samples/Mock-Ups	2	1	0	1
4.	O&M Manuals	7	4	1	2
5.	Personnel Qualifications	4	1	1	2
6.	Training Documents	4	1	1	2
7.	Source Quality Control Documents	4	1	1	2
8.	Material Field Test Reports	4	1	1	2
9.	Start-Up Documents	4	1	1	2
10.	Operational Demonstration Documents	4	1	1	2
11.	Special Warranties	4	1	1	2
12.	Project Record Documents	1	1	0	0

13. Extra Materials	1	1	0	0
14. Others	4	1	1	2

A. **Multiprime Contract Distribution**. The Engineer/Architect will forward all reviewed submittals to the Prime General Contractor only. The Prime General Contractor is then responsible to send each submittal to every Prime Contractor that it affects for their use.

3.4 SPECIFIC SUBMITTAL-TYPE EXECUTION REQUIREMENTS

A. O&M Manuals

1. Submittal Procedure. Submit one initial copy of the O&M manual for review. After approval of the initial copy, submit the remainder of the revised manuals.

2. Verification. Verify the accuracy of the initial O&M manual by visual and physical inspection of the installed equipment during start-up.

    a. Perform field verification in the presence of the Owner or Owner's Representative.
    b. Physically trace and document as required all wiring and piping.
    c. Visually inspect equipment and components and compare configurations and nameplate information to O&M manual.
    d. Make any changes, additions, or deletions to the O&M manual identified during field verification.
    e. In the event changes are made to the equipment following field verification, submit a final supplement of the revisions of the O&M manuals before approval.

B. **Samples for Tests**. Furnish samples of material as may be required for examination and test. Take all samples of materials for tests according to standard methods or as provided in the Contract Documents.

END OF SECTION

SECTION 01 55 27

INTERFERENCE WITH TRAFFIC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **General**. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **General**. Provide the labor, tools, equipment, and materials necessary to maintain traffic in accordance with the drawings and as specified herein.

1.3 QUALITY ASSURANCE

A. **Codes and Standards**. Perform all work in the maintenance of traffic in compliance with applicable requirements of governing agencies having jurisdiction.

B. **Maintenance of Traffic**. Maintain traffic in accordance with the *Manual of Uniform Traffic Control Devices*.

1.4 **SUBMITTALS** (Not used.)

1.5 JOB CONDITIONS

A. **Owner Requirements**. If proper maintenance of traffic facilities and proper provision for traffic control are not being provided and the safety of the public is thus endangered, the Owner may take the necessary steps to place them in proper condition and the cost of such services will be deducted from any payment which may be due or become due the Contractor.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used.)

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS (Not applicable.)

PART 3 - EXECUTION

3.1 **DESCRIPTION**. Furnish, erect, maintain, and remove lights, signs, barricades, temporary guardrails, and other traffic control devices, and furnish watchpersons and flag persons as may be necessary to maintain safe traffic conditions.

3.2 MAINTAINING TRAFFIC

A. **Traffic Diversion**. Whenever it is necessary to divert traffic from its normal channel, mark the diversion clearly by cones, drums, barricades, or temporary guardrail. Provide and maintain suitable lights if the markers are left in place at night.

B. **One-Way Traffic**. One-way traffic will not be permitted. Contractor shall maintain at least one lane of traffic in each direction at all times.

3.3 **CLOSED TO TRAFFIC**. Street closings will not be permitted.

END OF SECTION

SECTION 01 57 13

SEDIMENT AND EROSION CONTROL

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to work in this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Provide all labor, tools, equipment, and materials necessary to furnish and maintain the soil erosion controls where shown, where shown on the Contractor's Storm Water Pollution Prevention Plan (SWP3), where directed, and as specified herein.

B. **SWP3 Preparation**. Prepare an SWP3 for this project, obtain necessary permits, provide dust control, and terminate coverage under the permits, if necessary, upon completion of the work.

1.3 QUALITY ASSURANCE

A. **Codes and Standards**. Perform all work required in the control of erosion during construction in compliance with the following standards as referenced herein:

1. ODOT – Ohio Department of Transportation. Construction and Material Specifications (most recent edition).

2. ODNR – Ohio Department of Natural Resources. "Rainwater and Land Development Ohio’s Standards for Stormwater Management Land Development and Urban Stream Protection" (Rainwater and Land Development) current edition.

3. Ohio EPA – Ohio Environmental Protection Agency.

    a. National Pollutant Discharge Elimination System (NPDES) Permit No. OHC000004, “Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System” (General NPDES Permit).

B. **Conflicts**. In the event of a conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, regulations, or standards shall apply.

1.4 SUBMITTALS

A. **General**. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

B. Submittal Package No. 1 – SWP3 and Notice of Intent (NOI) Form (as needed)

1. Submit the Contractor's SWP3 including associated drawings and details of sediment and erosion control measures that will be employed during the project.

1.5 JOB CONDITIONS

A. Construction Sites Less than 1 Acre

1. SWP3. Develop and implement an SWP3 for the control of sediment and erosion at this project site throughout construction. At a minimum the SWP3 shall include the following:

   a. Site drawing showing the limits of all earth-disturbing activities, location of proposed temporary access roads or stockpiles, and location of all proposed sediment and erosion control features (i.e., silt fencing, sediment basins, temporary seeding, etc.). Include details for installation and material specifications for each erosion control feature.
   b. Written description of the proposed sediment and erosion control measures that will be employed, including a schedule for installation and removal of temporary controls as they are related to actual site construction. Also include information regarding site soils, any permanent or temporary seeding, an inspection and maintenance schedule, and all measures that will be employed by any subcontractors.

B. **Sediment and Erosion Control Shown on the Plans**. The sediment and erosion control measures shown on the plans, if any, are considered to be the minimum level of control required. Prepare the final SWP3 and use, if appropriate, alternate methods and locations of sediment and erosion control to meet the site requirements provided they are approved.

1.6 DELIVERY, STORAGE, AND HANDLING

A. **General**. Handle all sediment and erosion control materials in accordance with the manufacturer’s recommendations.

B. **Storage**. Store all seeds for temporary seeding in a safe, dry location protected from weather conditions that may affect the seed viability.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 **GENERAL**. The SWP3 shall incorporate some or all of the following equipment and materials for sediment and erosion control measures, as appropriate. Alternative materials and methods as presented in ODOT Item 832 or ODNR's Rainwater and Land Development manual may be considered.

A. **Sediment Barriers**. Sediment barriers are temporary measures using woven wire or other approved material attached to posts with filter cloth of burlap and plastic filter fabric to intercept, detain, and control sediment and erosion from leaving the construction site.

1. Filter Fabric/Silt Fence. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester, or ethylene yarn. Fabric shall be ODOT Item 712.09, Type C or equal.
2. Wire Fencing. Wire fence reinforcement for silt fences at storm drain inlets shall be a minimum of 42 inches in height and a minimum of 14 gauge, and shall have a maximum mesh spacing of 6 inches.
3. Silt Fence Posts. Posts for silt fences shall be either 2-inch-by-2-inch hardwood or equivalent steel with a minimum length of 32 inches. Steel posts shall have projections for fastening wire to them.
4. Storm Drain Inlet Protection Framing. Stakes and framing for yard, drainage ditch, or parking lot inlet protection shall be 2-inch-by-4-inch wood (preferred) or equivalent metal with a minimum length of 3 feet for the stakes/posts.

B. **Matting**. Matting shall be agricultural straw or coconut fiber within photodegradable netting, jute, excelsior, or approved equal synthetic material as specified in ODOT Items 671 and 712.11.

C. **Temporary Seeding and Mulching**. Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting used to reduce erosion. All cut-and-fill slopes including borrow pits shall be seeded and/or mulched where and when necessary to eliminate erosion.

1. Materials. Mulch.

   a. Straw. Straw mulch shall be unrotted small-grain straw, free of sticks or other foreign material.
   b. Wood Cellulose Fiber. Wood cellulose fiber mulch shall be dyed green and not inhibit seed germination.

2. Fertilizer. Fertilizer shall contain 12 percent total nitrogen, 12 percent available phosphoric acid, and 12 percent water-soluble potash. The name of plant nutrients, weight, and quarantined percentages shall be marked on the sealed containers.

PART 3 - EXECUTION

3.1 GENERAL

A. **Examination**. Inspect the existing and proposed site drainage patterns in order that the most efficient methods of erosion control may be selected through the duration of construction.

B. **Fill material and equipment storage** is prohibited within 200 feet of the stream bank, in the floodplain, in wooded areas, or in other environmentally sensitive areas. Dispose of surplus excavated materials off-site.

C. **Maintenance**. Be responsible for ongoing inspection and maintenance of the sediment and control features. At a minimum, complete an inspection log at least every 7 calendar days and within 7 days of each rainfall event. Repair/replace damaged features.

D. **Dust Control**. Minimize dust generation, including wetting down unpaved areas during the construction activities.

3.2 PREPARATION

A. General

1. Limit the surface area of erodible earth material exposed by the clearing and grubbing, excavation, borrow, and fill operations and provide immediate permanent or temporary control measures to prevent contamination of adjacent streams or other water courses, lakes, ponds, or other areas of water impoundment.
2. Such work will involve the construction of temporary ditch checks, filters, and benches, and use of temporary mulches, mats, seeding, or other control devices or methods necessary to control erosion and sedimentation.
3. Prepare and submit an SWP3 in advance of the work.
4. Limit the area of excavation, borrow, and embankment operations in progress commensurate with capability.
5. Deliver sediment and erosion control materials at appropriate times so that the project is not delayed.
6. Do not commence with any earth-disturbing activity until the appropriate sediment and erosion control features are in place.

B. **Sediment and Erosion Control Devices**. Minimization of denuded areas and the length of time that any area is denuded is the primary method of sediment and erosion control at any site. Adequate scheduling and the use of permanent and temporary seeding or mulching as described in paragraph 3.3 can accomplish this.

Areas that are to be denuded shall have structural control measures in place prior to exposure of the soil and such measures shall remain until the area is established and permanent measures are in place. In the case of silt fencing, which may require the rough grading to be completed prior to installation, it shall be installed as soon as practical. Structural measures shall include at a minimum:

1. Sediment basins for all drainage areas greater than 5 acres.
2. Aggregate construction entrances at all points of construction traffic egress from the site onto pavement.
3. Silt fencing at all areas of sheet flow.
4. Inlet protection at all storm water inlets.
5. Matting at all slopes greater than 3:1 and drainage swales/ditches.
6. Sediment traps or basins at all drainage areas that can not be adequately protected with silt fencing as determined by the Contractor developing the SWP3.
7. Silt fencing around soil stockpiles or cover them with tarps.

3.3 EROSION CONTROL

A. Permanent Erosion Control

1. Incorporate all permanent erosion control features into the project at the earliest practicable time.
2. Perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available.
3. Establish final grades and application of fertilizer, seed, and mulch.
4. Maintain sediment barriers until grass has grown.

B. Temporary Erosion Control

1. Provide temporary seeding and mulching as delineated in the SWP3, as directed, as specified in the general NPDES permit, and for all denuded areas that are to remain dormant for more than 14 days.
2. Apply temporary erosion control within 7 days after final or temporary grade has been reached that will remain dormant for more than 14 days.
3. For areas within 50 feet of a stream, apply temporary erosion control within 2 days after the most recent disturbance of an area that will remain dormant for more than 14 days.
4. Install temporary erosion control measures including seeding and mulching immediately if seasonal limitations make permanent control measures unrealistic.

Temporary seed shall be of the type specified in ODNR's Rainwater and Land Development manual for the time of year that it is applied. Temporary seeding shall also include application of 12-12-12 fertilizer at the rate of 6 pounds per 1,000 square feet and mulching in accordance with ODNR's Rainwater and Land Development manual.

3.4 SEDIMENT BARRIERS

A. **Filter Barriers (FB)**. Construct the FBs using synthetic filter fabric. They are designed for sediment removal and erosion control of low or moderate channelized flows not exceeding 1 cubic foot per second (cfs).

1. The height of an FB shall be between 15 inches and 18 inches.
2. Purchase filter fabric in a continuous roll and avoid the use of joints by cutting to the length of the barrier.
3. Space the stakes a maximum of 3 feet apart at the barrier location and drive them securely into the ground (minimum of 8 inches).
4. Excavate a trench approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.
5. Staple the filter material to the wooden stakes, and extend 8 inches of the fabric into the trench. Use heavy-duty wire staples at least 1/2 inch long. Do not staple filter material to trees.
6. Backfill the trench and compact the soil over the filter material.

7. Install straw bales on the downstream side of all filter barriers. Install bales in a single row and securely anchor them with a minimum of two stakes per bale.
8. If an FB is to be constructed across a ditch line or swale, the barrier shall be of sufficient length to eliminate end flow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope.
9. Remove FB when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

B. **Silt Fence (SF)**. SF is designed for situations in which only sheet or overland flows are expected, and the following drainage area limits are applied.

Silt Fence Maximum Drainage Area (Based on Slope of Drainage Area)	
Slope	**Maximum Drainage Area (Acres) to 100 Linear Feet of Silt Fence**
0-2% (<50:1)	0.5
2%-20%	0.25
>20%	0.125

SF details are included on the plans or within ODNR's Rainwater and Land Development manual.

1. Locate the silt fence at the flattest area available and follow a level contour of the land so that flows are dissipated into uniform sheet flow.
2. The height of an SF shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure).
3. Purchase the filter fabric in a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, splice filter cloth together only at a support post, with a minimum 6-inch overlap, and securely seal.
4. Drive posts securely into the ground (minimum of 12 inches).
5. Excavate a trench approximately 4 inches wide and 6 inches deep along the line of posts and upslope from the barrier.
6. Staple or wire the filter fabric to the fence, and extend 8 inches of the fabric into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Do not staple filter fabric to trees.
7. Backfill the trench and compact the soil over the filter fabric.
8. Remove SF when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

C. Maintenance

1. Inspect SF and FB a minimum of every 7 days and immediately after each rainfall or at least daily during prolonged rainfall. Make any required repairs immediately.

2. Should the fabric on an SF or FB decompose or become ineffective prior to the end of the expected useable life and the barrier is still necessary, replace the fabric promptly.
3. Remove sediment deposits after each storm event. They must be removed when deposits reach approximately one-half the height of the barrier.
4. Dress any sediment deposits remaining in place after the SF or FB is no longer required to conform with the existing grade, and prepare and seed them.

3.5 MATTING

A. **General**. Matting details are included in ODNR's Rainwater and Land Development manual. Provide matting:

1. On all final slopes 3:1 or greater.
2. Along the bottom of all drainage ditches until permanent seeding has grown and is established.
3. In areas where establishing vegetation is difficult.
4. Where mulch is difficult to hold in place due to wind or water.
5. Where water velocities exceed 3.5 feet per second.

B. **Securing**. Secure matting in accordance with the manufacturer's instructions or with No. 11 gauge, or heavier, sod staples that are a minimum of 6 inches in length.

C. Erosion Stops

1. Erosion stops are narrow trenches (6 to 12 inches deep) across the full channel section to prevent undermining and gullies from forming below the matting.
2. Provide them at a maximum spacing of 50 feet apart (more frequently if recommended by the matting supplier) in areas of high erosion potential and at the leading edge of a matting roll.
3. High erosion potential is in rocky areas that prevent soil-to-matting contact, erosive soils, and steep slopes.
4. Place the leading edge or piece of matting (for intermediate stops) within the narrow trench and secure it in place before backfilling the trench.

3.6 STORM DRAIN INLET PROTECTION (IP)

A. General

1. Provide temporary sediment control around all storm inlets until the tributary drainage area is permanently stabilized.
2. This shall consist of an inlet sediment filter of silt fencing as specified and detailed herein.
3. Utilize storm drain IP at all storm drain inlets in addition to matting and sediment barriers previously discussed.

B. **Yard, Drainage Ditch, or Parking Lot Inlet Protection**. Details are included in ODNR's Rainwater and Land Development manual.

1. Filter Fabric.

    a. Excavate earth to a minimum depth of 18 inches around inlet.
    b. Construct wood framing with a minimum burial depth of 8 inches at each corner of the inlet.
    c. Filter fabric shall include a wire mesh backing for structural support.
    d. Place backfill in 6-inch compacted lifts.
    e. Install a compacted earth check dam in the ditch line below the inlet if runoff bypassing the inlet will not flow to a sediment pond.

2. Drop Inlet Sediment Protection. Inlets may utilize an excavated drop inlet consisting of a 1- to 2-foot-deep excavation around the inlet to serve as a sediment trap.

    a. Expanded trap volume shall be in accordance with the requirements for sediment traps contained in this specification.
    b. Install 1-inch-diameter weep holes in the side of the inlet near the bottom of the excavated areas. Provide a gravel filter around weep holes. Weep holes shall be grouted before filling excavated area.
    c. Remove accumulated sediment when it has reached 40 percent of the trap depth.

C. **Curb Inlet Protection**. Details are included in ODNR's Rainwater and Land Development manual.

1. Frame. Construct a wooden frame that is anchored to the soil located behind the curb.
2. Screen. Form a geotextile fabric screen with wire mesh backing to the concrete gutter and against the face of the curb. Extend the screen 2 feet beyond the inlet throat on either end and fasten to the frame.
3. Stone. Place 2-inch stone over the screen to prevent water from entering the inlet under or around the geotextile fabric.

3.7 **SEDIMENT TRAPS**. Provide temporary sediment traps for sediment control for drainage areas totaling less than 5 acres when SF would be inadequate or inappropriate. Traps have a simple outlet structure stabilized with geotextile and riprap. Sediment trap details are included in ODNR's Rainwater and Land Development manual.

A. Design

1. Volume. Sediment trap shall include a minimum water volume of 67 cubic yards (cy) per acre of contributing drainage area plus sediment storage of 1,000 cubic feet (cf) per disturbed area of contributing area. Provide a larger water volume if required by the general NPDES permit.
2. Side Slopes. Maximum side slopes of 3:1.
3. Depth. 1.5 feet above outlet crest. Utilize a maximum height of 5 feet.
4. Dimensions. Maximize sediment removal efficiencies by maximizing surface areas and providing a minimum length-to-width ratio of 2:1.

5. Outlet. Provide either a piped discharge with outlet riser or an overflow spillway that is properly sized to ensure safe release of all storm water. Locate outlets, as much as practical, on the opposite side of the storm water entrance in order to avoid short-circuiting and maximize the sediment removal efficiency.
6. Channel Protection. Protect outlet spillways from erosion through use of a filter fabric and rock channel protection (ODOT Type C or D).

B. **Maintenance**. Maintain sediment level below the minimum water volume.

3.8 **TOP SOIL STOCKPILE**. Provide temporary drainage diversion of runoff around the topsoil stockpile to control soil erosion. Provide silt fencing around stockpiles or cover stockpiles with tarps to prevent erosion for sediment control.

3.9 **CONSTRUCTION ENTRANCES/EXITS**. Install a stabilized pad of aggregate over geotextile fabric at all locations where construction vehicles leave construction areas onto surfaces where runoff is not checked by sediment controls, and at all points of egress to paved roads.

A. Design

1. Bedding. Provide a geotextile fabric bedding at the base of the construction entrance.
2. Stone. Place 2-inch stone in a layer 6 inches thick over the fabric bedding.
3. Dimensions. Entrance/exit pad shall be a minimum of 14 feet wide by 50 feet long.

B. **Maintenance**. Apply additional stone as necessary to replenish the entrance/exit. Remove sediment from paved roads immediately through sweeping, scraping, or other appropriate measure.

3.10 DEWATERING

A. General

1. Give special attention to dewatering activities to minimize release of silt-laden water into the stream.
2. The discharges shall be free of sediment and released into only storm sewers, stream channels, or other stabilized drainage sources and not onto exposed soils or any other site where flows could cause further erosion.
3. If trench or ground water contains sediment, it shall pass through a sediment settling pond or other equally effective sediment control device, prior to being discharged from the construction site. Alternatively, sediment may be removed by settling in place or by de-watering into a sump pit, filter bag or comparable practice. Ground water which does not contain sediment or other pollutants is not required to be treated prior to discharge. However, care must be taken when discharging ground water to ensure that it does not become pollutant-laden by traversing over disturbed soils or other pollutant sources.

3.11 **ADDITIONAL MEASURES**. Select the sediment and erosion control measures utilized for a site based on the proposed construction activities, existing and proposed contours, site drainage system, and other site requirements or restrictions. Additional or alternative erosion and sediment control measures may be utilized with approval. Such measures include those specified in ODNR's Rainwater and Land Development manual.

END OF SECTION

SECTION 01 60 00

MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Transport and handle materials and equipment in accordance with the manufacturer's recommendations and requirements of Contract Documents. Make all arrangements for transportation, delivery, storage, and handling of equipment and materials required for prosecution and completion of the work.

1.3 **QUALITY ASSURANCE** (Not used)

1.4 **SUBMITTALS** (Not used)

1.5 **JOB CONDITIONS** (Not used)

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Deliver shipments of materials and equipment to the site only during regular working hours.
2. Shipments shall be addressed and consigned to the proper party giving name of Contract, street number, and city.
3. Shipments shall not be delivered to the Owner or Owner's Representative, except as otherwise directed.
4. Transportation shall be in accordance with Part 3 of this section.

B. Storage and Handling

1. Store, handle, and protect materials in accordance with the manufacturer's recommendations and the requirements of Part 3 of this section.
2. Maintain equipment in an undeteriorated and fully serviceable condition and as specified in Part 3 of this section.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 TRANSPORTATION

A. **General**. Arrange deliveries of products in accordance with the construction schedule and in ample time to facilitate inspection prior to installation.

B. Coordination

1. Coordinate deliveries to avoid conflict with work and conditions at site and to accommodate the following:

    a. Work of other contractors.
    b. Limitations of storage space.
    c. Availability of equipment and personnel for handling products.
    d. Owner's use of premises.

2. Do not have products delivered to project site until related shop drawings have been approved.
3. Do not have products delivered to site until required storage facilities have been provided.
4. Have products delivered to site in manufacturer's original, unopened, labeled containers. Keep Engineer/Architect informed of delivery of all equipment to be incorporated in the work.

C. **Inspection**. Immediately upon delivery, inspect shipment to ensure that:

1. Product complies with requirements of Contract Documents and reviewed submittals.
2. Quantities are correct.
3. Containers and packages are intact and labels are legible.
4. Products are properly protected and undamaged.
5. Damaged products are rejected and removed from the site.

3.2 HANDLING

A. Methods

1. Provide equipment and personnel necessary to handle products without soiling or damaging products or packaging.
2. Lift heavy components only at designated lifting points.
3. Handle materials and equipment at all times in a safe manner and as recommended by manufacturer or supplier so that no damage will occur to them.
4. Do not drop, roll, or skid products off delivery vehicles. Hand carry or use suitable materials handling equipment.
5. Keep interiors completely free of dirt and foreign matter.

3.3 STORAGE AND PROTECTION

A. General

1. Make all arrangements and provisions necessary for the storage of materials and equipment.
2. Place all excavated materials, construction equipment, and materials and equipment to be incorporated into the work so as not to damage anything.

3. Keep materials and equipment neatly and compactly stored in locations that will cause a minimum of inconvenience to other contractors, public travel, adjoining owners, tenants, and occupants.
4. Arrange storage in a manner to provide easy access for inspection.

B. Storage Areas

1. Areas available on the construction site for storage of material and equipment shall be as shown or otherwise approved.
2. Store materials and equipment which are to become the property of the Owner in a way to facilitate their inspection and ensure preservation of the quality and fitness of the work, including proper protection against damage by freezing and moisture.
3. Lawns or other private property shall not be used for storage purposes without written permission of the Owner in control of such premises.
4. Restore all storage areas to their original condition.

C. Storage Methods

1. Do not open manufacturer's containers until the time of installation unless recommended by the manufacturer or otherwise specified.
2. Do not store products in the structures being constructed unless approved in writing.
3. The following types of materials may be stored out-of-doors and on wood blocking so there is no contact with the ground.

    a. Masonry units.
    b. Reinforcing steel.
    c. Structural steel.
    d. Piping.
    e. Precast concrete items.
    f. Castings.
    g. Handrailing.

4. The following types of materials may be stored out-of-doors if covered with material impervious to water and sunlight. Store materials on wood blocking and tie down covers with rope and slope to prevent accumulation of water on covers.

    a. Construction lumber and wood for formwork.
    b. Fiberglass and plastic materials which are not ultraviolet (UV) protected.

5. Store all products not listed above in buildings or trailers which have a concrete or wooden floor, a roof, and fully closed walls on all sides.
6. Provide heated storage space for materials that would be damaged by freezing.
7. Protect mechanical and electrical equipment from contamination by dust, dirt, and moisture.

8. Maintain humidity at levels recommended by manufacturers for electrical and electronic equipment.

D. Inspection

1. Regularly inspect stored products to ensure that:

   a. State of storage facilities is adequate to provide required conditions.
   b. Required environmental conditions are maintained on continuous basis.
   c. Products exposed to elements are not adversely affected.

2. Be fully responsible for loss or damage to stored materials and equipment.

3.4 MAINTENANCE

A. **Maintenance Log**. Prepare a maintenance log for all equipment.

1. This log shall include a list of required maintenance services and inspections, as provided by the manufacturer.
2. The log shall include checklists for the periodic services and inspections required.
3. Initial and date the checklist upon completion of the individual servicing or inspection.
4. Locate the maintenance log in the field office and have it available for review until it is submitted for record purposes upon completion of the work and the start of the warranty period.

B. Preparation

1. Before removing an item from storage, review the installation location. Protection and services at the installed location must meet the equipment storage requirements.
2. Before moving equipment to the installed location, have materials available for temporary shelter or services required to establish the proper storage environment.

C. Performance of Maintenance

1. Perform all storage and preventive maintenance and inspections required by the manufacturer at the specified intervals from the time of delivery until completion of the work.
2. When notified by the Owner or Owner's Representative of a maintenance deficiency, perform corrective maintenance. Corrective maintenance will be performed per the manufacturer.
3. Reestablish storage maintenance in the event an item or equipment is removed from service.

END OF SECTION

SECTION 01 89 19

LEAKAGE TEST AND DISINFECTION

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to perform the leakage tests and disinfection of pipes, equipment, and tanks in accordance with the drawings and the specifications.

1.3 **QUALITY ASSURANCE**. Materials and workmanship shall be in accordance with the following standards as referenced herein:

A. **AWWA**. American Water Works Association.

B. **ASTM**. American Society for Testing and Materials.

C. **ACI**. American Concrete Institute.

1.4 **SUBMITTALS** (Not used)

1.5 **JOB CONDITIONS**. (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 **EXAMINATION**. Examine conditions under which the pipe section, facility, or part of a facility is to be tested or disinfected and verify that conditions are satisfactory and ready for the test to proceed.

3.2 PREPARATION

A. **Protection**. Protect adjacent equipment, materials, piping, and valving against drainage from testing and/or disinfection.

B. **Notification**. Notify the Engineer/Architect at least 24 hours prior to any testing and/or disinfecting. Notify the Owner at least 48 hours prior to any disinfecting. Notify the Engineer/Architect immediately of all unsatisfactory or nonconforming conditions.

C. **Responsibility**. Beginning the test means acceptance of all the existing surfaces and conditions.

3.3 PRESSURE MAIN LEAKAGE TESTING

A. **Description**. Provide the leakage tests as directed and as specified herein. Furnish gauges for the tests with the most recent gauge calibration test report available for review on-site.

B. **Test Section**. No test section shall be longer than 500 feet without approval.

C. **Leakage Allowances** (unless noted otherwise)

1. The maximum leakage allowance for all pressure mains shall be 10.49 gallons per inch diameter per mile of pipe per 24 hours.

D. Test Procedure

1. Slowly fill each pressure main section with water to the specified test pressure in a satisfactory manner.

2. Before applying the specified test pressure, expel all air from the pipe.

3. Maintain the test water pressure for at least 2 hours.

4. Determine leakage by measuring the quantity of water added to the main to maintain the specified test pressure.

5. Unless noted otherwise, minimum test water pressure shall be the greater of 1.5 times the working pressure or the following:

a. Mains carrying water – 150 pounds per square inch (psi).

3.4 DISINFECTION

A. General

1. Thoroughly clean, flush, and disinfect pipes, tanks, and equipment designed to carry water for domestic consumption before acceptance by the Owner.

2. Engineer/Architect will confirm that the item to be disinfected is thoroughly cleaned and flushed prior to disinfection.

3. Disinfection shall be done by the addition of suitable amounts of chlorine in the form of liquid chlorine or high test hypochlorite of lime.

4. The application shall be as approved by the Owner and in accordance with the appropriate AWWA standard listed below.

a. Water mains are under AWWA C651.
b. Water storage tanks are under AWWA C652.
c. Water treatment plants are under AWWA C653.

5. Perform tests for efficacy of disinfection, and repeat disinfection and tests as needed at no cost to the Owner.

6. Dispose of heavily chlorinated water in accordance with AWWA C651 and AWWA C651 Appendix B, and not to a sanitary sewer or the environment unless dechlorinated sufficiently to not interfere with treatment of sanitary sewage or the environment.

3.5 FIELD QUALITY CONTROL

A. Field Tests

1. Provide all test materials, equipment, chemicals, and water required for testing or disinfection at no additional cost to the Owner.
2. Perform testing according to the methods described in this section.

B. Witness

1. All leakage tests shall be witnessed and approved before acceptance.
2. Any test performed without witness by the Engineer/Architect, may require retesting the section in conformance with this specification at no cost to the Owner.

C. Test Results

1. If the field tests show excessive leakage, repair, adjust, modify, or replace the noncomplying sections until the tests are successfully completed.
2. If the field tests show noncompliance with the disinfection requirements, repeat the disinfection procedure until the tests are successfully completed.
3. This shall be done at no additional cost to the Owner.

3.6 **CLEANING AND DISPOSAL**. Remove and dispose of all excess material and debris as a result of the work completed under this section, including testing procedures.

3.7 PROTECTION

A. **Protect the sections tested** and approved, but prior to acceptance by the Owner.

B. **Protection of the tested** and approved piping sections shall include provisions during installation and testing of nearby piping, valving, or other adjacent equipment.

C. **Remove all protective measures** installed at completion and acceptance of the project.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. This section includes the clearing and grubbing of the work site and the following:

1. Clearing of area.
2. Grubbing of stumps and roots.
3. Removal of all other vegetation.
4. Protection of designated trees.
5. Removing above- and belowgrade structures.
6. Disposal off-site of all material generated by the clearing and grubbing operations.

1.3 **QUALITY ASSURANCE** (Not used.)

1.4 **SUBMITTALS** (Not used.)

1.5 JOB CONDITIONS

A. **Infrastructure Interference.** Conduct site clearing operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.

B. **Protection.** Provide protection necessary to prevent damage to existing improvements.

C. **Restoration.** Restore damaged improvements to their original condition.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used.)

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS (Not applicable.)

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Site Verification of Conditions**. Verify in the presence of the Engineer/Architect the specific areas and limits requiring clearing and grubbing. Also review any trees, shrubs, or other items which are not to be disturbed.

B. **Coordination**. Review with Engineer/Architect or other Owner's Representative requirements of surrounding areas such as adjacent property owners, roads, streets, walks, or other occupied or used facilities. Give evidence of proper permission for activities from authorities having jurisdiction to the Engineer/Architect.

3.2 PREPARATION

A. **Safety**. Provide protection as required for surrounding area and operation of any adjoining or affected utilities.

B. **Permits**. Obtain all required permits prior to beginning operations.

3.3 **LANDSCAPE REMOVAL.** Remove trees, shrubs, grass and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on site or premises as specifically indicated. "Removal" includes grubbing and off-site disposing of stumps and roots. Grubbing shall be carried to a depth of 18 inches below existing ground.

3.4 **PROTECTION OF EXISTING TREES AND VEGETATION**. Protect existing trees and other vegetation indicated to remain in place against unnecessary cutting, breaking, or skinning of roots; skinning or bruising of bark; and smothering of trees by stockpiling construction materials or excavated materials. Provide temporary guards to protect trees and vegetation to remain standing.

3.5 **SALVAGEABLE IMPROVEMENTS**. Carefully remove items indicated to be salvaged, and store on Owner's premises where indicated.

3.6 **BURNING.** Obtain prior approval from Owner and appropriate authorities before any burning is permitted.

3.7 **DISPOSAL.** Remove all trees, shrubs, plants, and other materials removed from the site.

END OF SECTION

SECTION 31 23 00

EXCAVATION, BACKFILL, AND EMBANKMENT

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Complete the excavation, backfill, and embankment necessary to construct the work as shown and specified herein. This section includes the following where applicable: structures, underground utilities, and preparing subgrade for pavements, walks, or slabs.

B. **Other Work**. Final grading together with placement and preparation of topsoil for lawns and planting is specified in Section 32 90 02, "Grading and Seeding." Excavation and backfill for buried piping are covered in Division 33.

C. Definitions

1. Excavation. The removal of material to required subgrade elevations and disposal of excavated materials.
2. Backfill. Below grade placement and compaction of specified materials to required elevations.
3. Unauthorized Excavation. The removal of materials beyond required subgrade elevations or dimensions without specific direction.
4. Subgrade. The undisturbed earth or the compacted soil layer immediately below foundations, pipe trenches, mud mats, pavement, slabs, walks, base, compacted foundation, embankment, or as shown.
5. Embankment. An engineered fill constructed of compacted, suitable earthen materials used to raise grade to the required elevations.

1.3 **QUALITY ASSURANCE**. Conform all work and materials to the following standards.

A. **ASTM**. American Society for Testing and Materials.

B. **OSHA**. Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) Part 1926.650 to .652, Subpart P. Construction Standard for Excavations.

1.4 **SUBMITTALS.** Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section. Do not deliver or install any materials before Submittal Packages 1 and 2 are approved.

A. Submittal Package No. 1 – Product Data and Test Laboratory Qualifications

1. Submittal package shall include:

   a. Product data noting each material source, location, sieve analysis, and other information which will show that the source and supplier are capable of furnishing materials meeting the requirements of these specifications. Submit name and location of all borrow pits.
   b. Name and address of acceptable test laboratory including the name and experience of the Engineer assigned to the field testing.

B. Submittal Package No. 2 – Samples

1. Samples shall include:

   a. Aggregate samples not less than 1/4 cubic foot each for the following:

      1) Granular backfill.
      2) Porous backfill.
      3) Base.
      4) Drainage Base.

   b. Filter Fabric. One-foot-square section.

C. Submittal Package No. 3 – Field Test Reports

1. Submit test reports within 48 hours of completion, suspension, or termination of testing the material including a copy of each test report called for in this section.

1.5 JOB CONDITIONS

A. Utilities

1. Existing Utilities.

   a. Notify utility companies and locate existing underground utilities in area of work.
   b. Where utilities are to remain in place, provide adequate means of support and protection during construction operations.
   c. Repair any Contractor-damaged utilities to the owner's satisfaction at the Contractor's expense.

2. Unforeseen Utility Location.

   a. Should a utility which is encountered during excavation be unrecorded or recorded incorrectly, consult the utility immediately for directions.

b. Cooperate with the utility or Owner in keeping respective services or facilities in operation.
c. Repair damaged utilities to the satisfaction of the utility owner.

3. Interruption.

a. Do not disrupt existing utilities except when approved.
b. Provide acceptable temporary utility services unless approved otherwise.

4. Notification. Provide a minimum of 48 hours notice to utility companies and Owner or Engineer/Architect before excavating or interrupting utilities.

B. **Blasting**. Blasting is not permitted.

D. **Borrow**. Should the excavated material be insufficient to provide all of the fill required, supply satisfactory material from another source at no cost to the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Topsoil

1. Remove, stockpile, and place in the areas to be seeded topsoil that is available as a part of the excavated materials.
2. Shape stockpile and grade to drain.

B. **Excavated Material**. Stockpile excavated material when suitable for use as backfill or embankments onsite as directed.

C. **Stockpiles**. Shape and grade stockpile. Handle the material so that the gradation remains uniform and foreign material is not incorporated into the mix.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 MATERIALS

A. **General**. All materials shall be free of elastic soil materials, debris, waste, frozen material, vegetation, organics, peats, or other deleterious material.

B. Backfill and Embankment

1. Soil.

a. Earth materials which have resulted from natural processes such as weathering, decay, and chemical action.
b. More than 35 percent weight of the grains or particles will pass a No. 200 sieve and have a plastic index of 4 or more.
c. Free of aggregate or rock larger than 2 inches in any dimension.

2. Aggregate Material.

   a. Natural mineral aggregate such as gravel, crushed gravel, crushed rock, or sand.
   b. At least 65 percent by weight of the grains or particles will be retained on a No. 200 sieve.
   c. At least 90 percent by weight of the grains or particles shall pass the 3-inch sieve.
   d. Remove rock pieces larger than 6 inches in any dimension.

3. Shale. Finely stratified, laminated material formed by consolidation in nature, mudstone, claystone, siltstone, and clay bedrock. Break into predominantly fine particles which can be readily tested for compaction requirements as soil.

4. Rock. Sandstone, limestone, dolomite, glacial boulders, and old concrete which are crushed into pieces that can readily be incorporated into a specified lift thickness and compacted according to requirements for granular materials.

C. **Granular Backfill**. Granular backfill shall be crushed or uncrushed granular material meeting the following grading requirements:

Sieve	Total Percent Passing
2-1/2 inch	100
1 inch	70 – 100
No. 4 (3/16 inch)	25 – 100
No. 40	10 – 50
No. 200	5 – 15

The fraction passing a No. 40 sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 6.

D. **Porous Backfill**. Porous backfill shall be granular material meeting the requirements of ASTM D 448, No. 57, 67, or 78 size.

E. **Mud Mat**. Unless shown or directed otherwise, all mud mats shall be concrete.

1. Concrete. A concrete mud mat shall consist of a 3-inch layer of Class C concrete.
2. Granular Material. A granular mud mat shall consist of a 4-inch layer of crushed aggregate meeting the requirements of porous backfill.

F. **Base**. Base shall be crushed granular material meeting the following grading requirements.

Sieve	Total Percent Passing
2 inch	100
1 inch	70 – 100
3/4 inch	50 – 90
No. 4	30 – 60
No. 30	9 – 33
No. 200	0 – 15

G. **Drainage Base**. Drainage base shall be crushed granular material meeting the requirements of ASTM D 448 No. 57, 67, or 78 size.

H. **Filter Fabric**. Furnish Type D filter fabric unless shown otherwise. The fabric shall be composed of strong, rotproof, polymeric fibers formed into a woven or nonwoven fabric conforming to the following requirements.

Type A: Underdrains and Slope Drains		
Minimum Tensile Strength	ASTM D 4632	80 lb (335 N)
Minimum Puncture Strength	ASTM D 4833	25 lb (110 N)
Minimum Tear Strength	ASTM D 4533	25 lb (110 N)
Apparent Opening Size	ASTM D 4751	
Soil Type 1: Soils with 50% or less passing No. 200 (75µm) sieve		AOS ≤0.6 mm
Soil Type 2: Soils with 50 to 85% passing No. 200 (75 µm) sieve		AOS ≤0.3 mm
Minimum Permeability	ASTM D 4491	$1x10^{-2}$ cm/sec
Type B: Filter Blankets for Rock Channel Protection		
Minimum Tensile Strength	ASTM D 4632	200 lb (890 N)
Minimum Puncture Strength	ASTM D 4833	80 lb (355 N)
Minimum Tear Strength	ASTM D 4533	50 lb (220 N)
Minimum Elongation	ASTM D 4632	15%
Apparent Opening Size	ASTM D 4751	AOS ≤0.6 mm
Minimum Permeability	ASTM D 4491	$1x10^{-3}$ cm/sec
Type C: Sediment Fences		
Minimum Tensile Strength	ASTM D 4632	120 lb (535 N)
Maximum Elongation at 60 lb (265 N)	ASTM D 4632	50%
Minimum Puncture Strength	ASTM D 4833	50 lb (220 N)
Minimum Tear Strength	ASTM D 4533	40 lb (180 N)
Apparent Opening Size	ASTM D 4751	AOS ≤0.84 mm
Minimum Permittivity	ASTM D 4491	$1x10^{-2}$ sec^{-1}
Ultraviolet Exposure Strength Retention	ASTM D 4355	70%
Type D: Subgrade-Base Separation or Stabilization		
Minimum Tensile Strength	ASTM D 4632	180 lb (800 N)
Maximum Elongation at 170 lb (755 N)	ASTM D 4632	35%
Minimum Tear Strength	ASTM D 4533	70 lb (310 N)
Minimum Puncture Strength	ASTM D 4833	70 lb (310 N)
Apparent Opening Size	ASTM D 4751	Same as Type A
Permeability	ASTM D 4491	$1x10^{-3}$ cm/sec

Type E: Pavement Reinforcement Fabric
AASHTO M 288, Section 9, Table 7

All minimum strengths shown are average roll minimum values in the weakest principal direction.

Ensure that the fabric is free of any treatment that might significantly alter its physical properties. During shipment and storage, wrap the fabric in a heavy-duty protective covering to protect it from direct sunlight, dirt, dust, and other debris.

I. Filter Fabric Securing Pins

1. 3/16-inch minimum diameter.
2. Steel.
3. Pointed at one end.
4. Fabricated with a head to retain a steel washer having an outside diameter not less than 1-1/2 inches.
5. At least 18 inches long.

J. **Topsoil**. In accordance with Section 32 90 02, "Grading and Seeding."

PART 3 - EXECUTION

3.1 **EXAMINATION**. Verify actual field/site conditions and confirm grades, elevation, and other pertinent information before beginning excavation.

3.2 PREPARATION

A. **Notify all utilities** and adjacent owners of structures or pavements of the excavation.

B. **Notify owners** of adjoining properties or utilities in case of emergencies.

3.3 EXCAVATION

A. **Topsoil**. Remove topsoil and place in separate stockpile.

B. Protection

1. Excavations. Protect all excavations by bracing, sheeting, piling, slope benching, or other acceptable means in accordance with OSHA 29 CFR Part 1926.650 to .652, Subpart P. Be responsible for protection of the excavation at all times.
2. Existing Structures. Protect existing structures, utilities, sidewalks, pavements, and other facilities from damages caused by settlement, lateral movement, undermining, washout, and other hazards created by construction operations including dewatering operations.
3. Barricade open excavations.

C. Drainage

1. Direct surface water away from excavations to prevent erosion and undermining of foundations.
2. Provide and maintain diversion ditches, dikes, and grading as necessary during construction.
3. Protect excavated slopes and backfill surfaces to prevent erosion and sloughing.
4. Perform excavation so that the site and the area immediately surrounding the site and affecting operations at the site shall be continually and effectively drained.

D. Dewatering

1. Control groundwater flowing toward or into excavations to prevent sloughing of excavation slopes and walls, boils, uplift, and heave in the excavation.
2. Do not use French drains, sumps, ditches, or trenches within 3 feet of the foundation of any structure unless authorized.
3. Take control measures by the time the excavation reaches the groundwater level in order to maintain the integrity of the in situ material.
4. While the excavation is open, maintain the water level a sufficient distance below the working level to provide a stable working surface.

E. Rock Excavation

1. Definition.

    a. Rock excavation is defined as the removal of:

        1) Unanticipated solid concrete (excluding pavements), unanticipated solid masonry, or boulders each of which has a volume greater than 1 cubic yard.
        2) Bedrock which requires for its removal drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool.

    b. Rock excavation is not excavating:

        1) Existing concrete or masonry structures or pavements shown.
        2) Material which can be excavated using an appropriately sized, heavy-duty, power-operated excavator, backhoe, or shovel, all of which are equipped with bucket-mounted ripping teeth.
        3) Material that can be excavated with a hand pick and shovel.
        4) Soft or disintegrated bedrock such as weathered shale, clay shale, claystone, or mudstone, or overconsolidated soils such as "hardpan."

5) Previously blasted materials or materials that are intermittently drilled and blasted to merely increase production.

2. Blasting. Do not blast unless approved.

3. Limits. Unless otherwise noted, excavate rock to the bottom of structures and to a minimum clear width of 6 inches around the outer limits of the structures.

F. **Disposal**. Dispose of all excavated material unless otherwise shown.

1. Excavated material which is satisfactory may be used for backfill and embankments.
2. Dispose of excavated material which is unsatisfactory or surplus off-site.

G. **Excavation for Structures**. Conform to required elevations and dimensions within a tolerance of 0.10 foot, and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and inspection.

1. Excavations for Footings and Foundations.

a. Do not disturb bottom of excavation.
b. Excavate by hand to final grade just before concrete reinforcement is placed.
c. Trim bottoms to required lines and grades to leave solid base to receive other work.

2. Excavations for Pile Foundations.

a. Stop excavations from 6 inches to 12 inches above bottom of pile cap before piles are placed.
b. After piles have been driven, remove loose and displaced material.
c. Excavate to final grade, leaving solid base to receive concrete pile caps.

H. **Excavation for Pavements**. Excavate under pavements to comply with required cross sections, elevations, and grades.

3.4 SUBGRADE

A. **Freeze Protection**. Protect the following from freezing:

1. Excavation bottoms or material on which foundations will be constructed.
2. Constructed foundations.
3. Subgrades.

B. **Disturbed Subgrade**. Using an approved method, remediate disturbed subgrade caused by inundation or inadequate dewatering procedures. Perform these remedial measures at no cost to the Owner.

C. **Mud Mat**. Provide a mud mat as shown or where site conditions require a mud mat to protect subgrade.

D. **Unauthorized Excavation**. Backfill unauthorized excavation below design elevations with Class C concrete or other approved material at no cost to the Owner.

E. **Unsuitable Bearing Materials**. Remove unsuitable bearing materials encountered at design elevations and replace with a suitable bearing material as directed.

F. **Shape the subgrade** at all foundations, slabs, and pavements so that the required thickness of the foundations, slabs, pavements, and granular material can be maintained.

G. Pavement and Slab Subgrade

1. Compact all pavement and slab subgrades to a depth of 12 inches.
2. Replace subgrade soils with a maximum dry density of less than 100 pounds per cubic foot under pavement and slabs with suitable soil or granular material.
3. Compact soil subgrades with a maximum dry density of 100 to 105 pounds per cubic foot to at least 102 percent.
4. Compact all other soil subgrades to at least 100 percent.
5. The moisture content shall be between the optimum moisture content and 3 percent above the optimum moisture content.

H. Proofrolling

1. Unless directed otherwise, proofroll all subgrades for pavements, slabs, and embankments.
2. Remove debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to proofrolling and placement of fill for embankment.
3. The proofrolling equipment shall consist of an acceptable pneumatic-tired vehicle such as a loaded dump truck.
4. The gross load of the vehicle shall be at least 25 tons.
5. Roll the entire plan area of the subgrade with at least two passes of the vehicle or as directed.
6. Adjacent passes shall be offset no more than 6 inches to provide complete coverage of the area.
7. Remove and replace any soft, wet, or weak areas detected by the proofrolling with acceptable material or scarify, moisture-condition, and recompact.

I. Filter Fabric

1. Surfaces to receive fabric shall be relatively smooth and free of obstructions and debris.
2. Place the fabric loosely without wrinkles and creases.
3. Where joints are necessary, place strips to provide a 12-inch minimum overlap.
4. Place securing pins with washers at 2-foot intervals along joints and at 5-foot intervals elsewhere to prevent slippage of the fabric.

3.5 BACKFILL AND EMBANKMENTS

A. General

1. Place and compact backfill material as shown and specified in this section.

2. Adjacent to structures:

   a. Use backfill where it will support landscaping.
   b. Use granular backfill where it will support structures and slabs.

3. Backfill excavations as promptly as work permits, but not until completion of the following:

   a. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   b. Inspection, testing, approval, and recording locations of underground utilities have been performed and recorded.
   c. Removal of concrete formwork.
   d. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
   e. Removal of trash and debris from excavation.
   f. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
   g. After the first floor slab has been poured and set on building walls, unless otherwise approved.
   h. Testing water-bearing walls for watertightness.

B. Placement

1. Backfill against other work shall be in a manner and at such time as not to endanger the stability or damage the work.

2. Do not place any lift on surfaces that are muddy or frozen, or contain frost or ice.

3. Place backfill and fill materials evenly around structures, piping, or conduit to required elevations.

4. Place granular materials after the subgrades have been leveled.

5. Unless noted otherwise, all references to degree of compaction are expressed as a percentage of the maximum dry density in accordance with ASTM D 698 (standard Proctor).

6. Before compaction, moisten or aerate each lift as necessary to provide appropriate moisture content.

7. Place and compact materials in lifts as specified in the following paragraph.

    a. Backfill.

        1) Maximum 6-inch loose layers unless using hand tampers.
        2) Maximum 4-inch loose layers when hand-operated tampers are used.
        3) Compact each layer to at least 95 percent unless noted otherwise.
        4) Compact backfill for voids, depressions, or holes resulting from the demolition of existing structures to 100 percent.
        5) Moisture content between 1 percent below optimum and 3 percent above optimum.

    b. Granular Backfill.

        1) Maximum 6-inch loose layers unless using hand tampers.
        2) Maximum 4-inch loose layers when hand operated tampers are used.
        3) Compact each layer to at least 100 percent.
        4) Moisture content at or near optimum.

    c. Base.

        1) Maximum 6-inch compacted layers.
        2) When shown as more than 6 inches thick, place material in equal layers but no layer more than 6 inches compacted thickness.
        3) When supporting a structure or slab, compact each layer to at least 100 percent.
        4) In all other situations, compact each layer to at least 98 percent.
        5) Moisture content within 1 percent of the optimum.

d. Porous Backfill.

1) Maximum 6-inch compacted layers.
2) Compact each layer to at least 95 percent unless supporting a structure if supporting a structure, compact to 100 percent.

e. Granular Mud Mat. Compact at least 100 percent.

f. Drainage Base.

1) Maximum 6-inch compacted layers.
2) When shown as more than 6 inches thick, place material in equal layers but no layer more than 6-inch compacted thickness.
3) Compact each layer to at least 100 percent.

8. Moisture Conditioning.

1) Where the subgrade or a lift of soil material must be moisture conditioned before compaction, uniformly apply water to surface.
2) Apply water sparingly to prevent free water from appearing on surface during or subsequent to compaction operations.

C. Grading

1. Smooth the finished surface within specified tolerances.

2. Grade and compact areas with uniform slopes between required elevations or between such points and existing grades.

3. Grade areas to drain away from structures and to prevent ponding.

4. Finish surfaces free from irregular surface changes and as follows:

a. Lawn or Unpaved Areas. Grade areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
b. Pavements and Walks. Shape surface of areas under pavement to line, grade, and cross section, with surface not more than 1/2 inch above or below required subgrade elevation.

D. Embankments

1. Continuously bench sloped surfaces steeper than 1 vertical to 8 horizontal so that embankment material will bond with existing surface.

2. Maximum 6-inch loose layers.

3. Compact each layer to the minimum percent of maximum dry density specified herein.

Compaction Maximum Dry Density lbs/cf	Minimum Percent Maximum Dry Density
90-104.9	102
105-119.9	100
120 and more	98*

*100 if embankment supports a structure foundation.

4. Moisture Content.

   a. The moisture content shall be between the optimum moisture content and 3 percent above the optimum moisture content.
   b. For material which displays pronounced elasticity or deformation under action of compaction equipment, reduce the moisture content to optimum to secure stability.

3.6 FIELD QUALITY CONTROL

A. Field-Testing

1. Test Laboratory. Employ an acceptable soils testing laboratory to determine the following:

   a. Moisture density relationship of the materials to be compacted.
   b. Field moisture and density to verify the degree of compaction being obtained.
   c. The strength of subgrades supporting structures.

2. The soils testing laboratory personnel shall be on-site continuously during all placement and compaction activities including backfills and embankments to determine compliance with this specification section.

3. Tests will be located by the Engineer/Architect.

4. Allow testing services to inspect and approve subgrades, backfill, drainage fill, and embankment layers before further construction work is performed.

5. Perform field density tests as follows, in accordance with ASTM D 1556 or D 2922. Perform footing subgrade strength tests using acceptable calibrated instruments.

   a. Footing Subgrade. Conduct at least one test to verify required design bearing for each footing location. For a strip footing, conduct one test for every 50 linear feet of footing.

b. Building Slab or Paved Areas. Make at least one field density subgrade test for every 2,000 square feet, but in no case less than three.

c. Backfill, Base, Drainage Base, and Embankment. Field density tests shall be made at least once for every 50 cubic yards, or fraction thereof, and at least one test per lift (compacted layer).

d. Wall Backfill. Take at least one field density test, per side, at locations directed for each lift (compacted layer).

6. If the subgrade, backfill, drainage fill, or embankment is below specified density, provide additional compaction and testing at no additional cost to the Owner.

B. **Settling**. Where settling is measurable or observable during the general project warranty period, remove the surface (pavement, lawn, or other finish), add backfill, compact, and replace surface at no cost to the Owner.

3.7 GRADING FOR SEEDING

A. Rough Grading

1. Trim and grade all areas to within 4 inches of the finished grades.
2. These areas are to be free from rock or other foreign material 3 inches or greater in any dimension.

B. **Finished Grading**. Spread topsoil to conform to the required finished grades.

END OF SECTION

SECTION 32 10 01.01

PAVEMENT AND WALKS

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to construct the pavement and walks in accordance with plans and specifications.

1.3 QUALITY ASSURANCE

A. **Standards**. Material and work shall be in conformance with:

1. ODOT – Ohio Department of Transportation.

B. **Testing Laboratory**. Engage an acceptable testing laboratory to perform subgrade inspection and compaction tests.

1.4 **SUBMITTALS**. Submit all submittals in accordance with the Division 1 Submittal Requirements and the requirements within this specification section.

A. Submittal Package No. 1 – Product Data

1. Product Data on all materials.
2. Written certification that all materials and mixes are in conformance with specifications.

1.5 **JOB CONDITIONS** (Not used)

1.6 DELIVERY, STORAGE, AND HANDLING

A. **Delivery**. Comply with ODOT Item 401.11 hauling requirements.

B. **Storage**. Comply with ODOT Item 106.05.

C. **Handling**. Comply with ODOT Item 106.06.

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 **MATERIAL**. All materials shall be in accordance with ODOT "Construction and Material Specifications."

A. Bases

1. Aggregate. Aggregate base shall be in accordance with ODOT Item 304. Do not use slag.

2. Asphalt Concrete. Asphalt concrete base shall meet the specifications of ODOT Item 301.

B. **Prime Coat**. Prime coat shall be in accordance with ODOT Item 408. Materials shall conform to the applicable requirements of 702 for the asphalt material and use one of the following types: 702.02 RC-70, RC-250, MC-30, MC-70, or MC-250; or 702.03 Primer 20.

C. **Tack Coat**. Tack coat shall be in accordance with ODOT Item 407. Materials shall conform to the applicable requirements of 702 for the asphalt material and use one of the following types: 702.04 RS-1, SS-1, SS-1h, CRS-1, CSS-1, CSS-1h; or 702.13.

D. Asphalt Concrete

1. Surface Course. Asphalt concrete surface course shall be in accordance with ODOT Items 441, 446, and/or 448 and as indicated on the plans. The surface course type shall be as indicated on the plans.
2. Intermediate Course. Asphalt concrete intermediate course shall be in accordance with ODOT Items 441, 446, and/or 448 and as indicated on the plans. The intermediate course type shall be as indicated on the plans.

E. **Concrete with Portland Cement**. Concrete shall be in accordance with Engineer's requirements or ODOT Item 452.

F. **Expansion Joint**. Expansion joints shall be 1/2-inch-thick premolded, nonextruding type.

PART 3 - EXECUTION

3.1 PREPARATION

A. **Coordination**. Coordinate all pavement installation with proper authorities and with other work of contract such that there is minimum disruption of the completed pavement and/or delays of other work.

B. **Verification of Conditions**. Verify that subgrade is at proper elevation and slope where required and that moisture will not interfere with compaction.

C. **Topsoil**. Remove topsoil. See Section 32 90 02, "Grading and Seeding."

D. Subgrade

1. See Sections 31 23 00, "Excavation, Backfill, and Embankments," for compaction requirements.
2. Remove all loose and foreign materials.
3. Place base material when the subgrade is free of ruts and standing water.

E. Slope

1. Slope pavement to drain away from buildings and structures.
2. Driveways in open areas shall have a center crown.
3. Cross slope for driveways and walks shall be 3/16 inch per foot unless otherwise shown.

F. Existing Pavement

1. Conform pavement to the grade of existing pavements or walks unless noted otherwise.
2. Where it is necessary to disturb existing Portland cement concrete pavements or walks, saw-cut in neat, straight lines a minimum depth of 2 inches.
3. Where it is necessary to disturb existing asphalt concrete pavement or walks, saw-cut the asphalt concrete with straight vertical edges. Seal all cut bituminous surfaces with a bituminous material.

G. **Arrange for inspection** and testing as work progresses.

3.2 **PAVEMENT**. All construction shall be in accordance with ODOT "Construction and Material Specifications."

A. Asphalt Pavement

1. Aggregate Base.

   a. Aggregate base shall consist of compacted aggregate applied in layers of equal thickness to a depth shown and in accordance with Item 304.04.
   b. Maximum lift thickness shall be 8 inches when vibratory rollers greater than 12 tons are used, 6 inches when vibratory rollers between 10 and 12 tons are used, and 4 inches when vibratory rollers are not used.
   c. Compaction shall be in accordance with ODOT Item 304.05.

2. Prime Coat. Apply according to ODOT Item 408 at the rate of 0.40 gallon per square yard.

3. Install asphalt concrete base in two layers each 3 inches thick after compaction.

4. Wearing Surface.

   a. Unless otherwise shown, wearing surface shall consist of 3 inches of asphalt concrete applied in two layers.
   b. The surface course shall be 1-1/4 inches thick after compaction.
   c. The intermediate course shall be 1-3/4 inches thick after compaction.

5. Install asphalt concrete base and asphalt pavement in accordance with ODOT Items 301, 441, 446 or 448 surface course, and 446 or 448

intermediate course. The surface course type and intermediate course type shall be as shown.

B. Gravel Pavement

1. Gravel pavement shall consist of an 8 inch course of compacted aggregate base applied in two layers, each 4 inches thick after compaction.
2. Place in accordance with ODOT Item 304.04.
3. Compact in accordance with ODOT Item 304.05.

C. Resurfacing

1. Surface Preparation. Place no material until the existing surface areas have been examined and all holes, broken edges, cracks, and damaged areas have been repaired.
2. Tack Coat. Apply according to ODOT Item 407 at the rate of 0.15 gallon per square yard.
3. Wearing Surfaces. Resurface existing areas shown on the plans with a minimum of 2 inches of ODOT Item 448 asphalt concrete after compaction.

D. Temporary Pavement

1. Temporary pavement is limited for use as temporary patches in existing streets, drives, and walks.
2. Temporary pavement shall be the asphalt concrete surface course specified in this section.
3. The surface on which the temporary pavement is to be placed shall be cleaned and maintained free of materials that would contaminate the mixture or preclude proper placement.
4. All temporary pavement shall be a minimum of 2 inches thick unless noted otherwise.
5. Conform pavement to the grade of the existing street, drive, or walk.

3.3 **ASPHALT CONCRETE WALKS**. Construct as specified for asphalt concrete pavement, except aggregate base shall be 4 inches thick and the wearing surface meeting ODOT Item 441 shall be a minimum of 2 inches thick.

3.4 **CONCRETE WALKS**. Concrete walks shall be 4 inches thick, except on driveways which will be 6 inches set on a 4-inch compacted aggregate base. Float-finish concrete with a tooled joint every 4 feet and an expansion joint every 20 feet.

3.5 FIELD QUALITY CONTROL

A. **Spreading and Surface Tolerances**. The variation of the aggregate surface shall be in accordance with ODOT 301, 304, and 401 after compaction.

B. **Compaction**. In addition to requirements of ODOT 301, 304, 401, and 441, test the aggregate by proofrolling with vehicle loads equal to or exceeding 80,000 pounds per four axles or 20,000 pounds per single axle.

C. **Tolerance of Completed Surface**. The variation of the completed surface courses shall not exceed the requirements of ODOT 401.16.

END OF SECTION

SECTION 32 90 02

GRADING AND SEEDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **General**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Provide the grading and seeding as shown and specified herein.

1.3 QUALITY ASSURANCE

A. Certificate of Inspection

1. Ship all seeds with a certificate of inspection in accordance with the governing authorities.
2. Label all bags of seed and fertilizer with legible waterproof tags or directly on the bag.

1.4 SUBMITTALS

A. **General**. Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section.

B. Submittal Package No. 1 – Product Data and Certified Statement

1. Submit seed vendor's certified statement for each grass seed mixture required that includes:

    a. Botanical and common name.
    b. Percentage by weight.
    c. Percentages of purity, germination, and weed seed for each grass seed species.

2. Product Data. Submit information on all materials included in this specification.

1.5 JOB CONDITIONS

A. **General**. Proceed with grading and seeding as soon as portions of the site become available, working within seasonal limitations and the seed manufacturer's recommended limitations regarding weather conditions and temperatures.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Deliver seed only when site conditions are ready.
2. Deliver materials in unopened containers showing weight, mixture analysis, package date, and manufacturer.

B. Storage and Handling

1. Store and cover material to prevent wetting and deterioration.
2. Remove packages from the site that have become wet, moldy, or damaged, or show water marks.

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS

2.1 MATERIAL

A. **Topsoil**. Topsoil shall contain:

1. A maximum of 40 percent clay in that portion passing a No. 10 sieve.
2. Between 5 and 20 percent organic matter as determined by loss on ignition of samples oven-dried at 212 degrees Fahrenheit (º F.) to a constant weight.

B. **Fertilizer**. Fertilizer shall contain the specified percentages of total nitrogen, available phosphoric acid, and water soluble potash. The weight, name of plant nutrients, and guaranteed percentages shall be marked on the sealed fertilizer containers.

1. 12-12-12. This fertilizer shall be used with Seed Mixes 1, 2, 3, and 5.
2. 5-10-10. This fertilizer shall be used with Seed Mix 4 (Crownvetch).

C. **Inoculant**. Treat Seed Mix 4 (Crownvetch) with inoculant culture of nitrogen fixing bacteria less than 1 year old.

D. **Seed**. Percentages are by weight.

	Minimum Germination	Minimum Purity
1. Seed Mix 1		
40% Kentucky Bluegrass (*Pos pratensis*)	75%	85%
40% Creeping Red Fescue (*Festuca rubra*)	85%	98%
20% Annual Ryegrass (*Lolium multiflorum*)	85%	95%

		Minimum Germination	Minimum Purity
2.	Seed Mix 2 30% Kentucky Bluegrass (*Pos pratensis*) 50% Kentucky 31 Fescue (*Festucaarundinacea* var. Ky. 31) 20% Annual Ryegrass (*Lolium multiflorum*)	75% 85% 85%	85% 95% 95%
3.	Seed Mix 3 90% Perennial Ryegrass (*Lolium perenne*) 10% Alsike Clover (*Trifolium hybridum*)	85% 85%*	95% 98%
4.	Seed Mix 4 (Crownvetch) 30% Crownvetch (*Coronilla varia*) 30% Kentucky 31 Fescue (*Festuca arundinacea var. Ky. 31*) 30% (Pennlawn) Red Fescue (*Festuca rubra*) 10% Annual Ryegrass (*Lolium multiflorum*)	70%* 85% 85% 85%	99% 95% 98% 95%
5.	Seed Mix 5 80% Kentucky Bluegrass (*Poa pratensis*) 20% Annual Ryegrass (*Lolium multiflorum*)	75% 85%	85% 95%

*Germination includes a total of quick germination plus hard seeds.

E. Mulch

1. Straw. Straw mulch shall be baled wheat or oat straw free of weed seed, sticks, or other foreign material.
2. Wood Cellulose Fiber. Dye the wood cellulose fiber mulch green.

F. **Asphalt Emulsion**. Do not use asphalt emulsions.

G. Mow Strip Blocks

1. Install concrete mow strips as shown and specified herein. Mow strips shall be precast concrete. Provide two anchor pins for each block. Field-cut blocks to achieve necessary radii.

2. Description.

   a. Height. 6 inches.

b. Width. 8 inches.
c. Length. 8 feet.
d. Securing Holes. 7/8-inch diameter.
e. Anchor Pins. No. 6 reinforcement bar, galvanized, 16 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

A. **Verification**. Verify that final grades and elevations have been achieved in all areas. Remove all exposed debris and stones larger than 3/4 inch in any dimension from seeded areas.

3.2 PREPARATION

A. **Soil Tests**. Test soil as necessary to ensure acceptable seeding conditions.

3.3 SEEDING

A. **Seed Mix**. Seed all privately owned lawns with Seed Mix 5. On all privately owned cultivated fields, place the seedbed but do not seed. Seed all other disturbed areas with Seed Mix 1, unless otherwise noted.

B. Preparation of Seedbed

1. Remove, stockpile, and use for seedbed topsoil that is available as part of the excavated material.
2. Remove all grass, weeds, roots, sticks, stones, and other debris and finish the seedbed with careful hand raking.
3. If there is a deficiency of topsoil as part of the excavated materials, provide topsoil from another source at no cost to the Owner.
4. The seedbed shall be a minimum of 4 inches of topsoil.
5. Prepare a smooth seedbed before seeding.

C. **Dry Seeding**. When a seed mix is sown dry, apply the materials as follows:

1. Fertilizing.

   a. Apply fertilizer uniformly to all areas to be seeded at the rate of 10 pounds per 1,000 square feet.
   b. Disk, harrow, or rake the fertilizer into the seedbed to a depth of 2 inches.

2. Seeding. Mix thoroughly and sow uniformly the seed over the prepared areas. After sowing, rake, drag, or otherwise treat the area to cover the seed with soil to a depth of 1/4 inch.

   a. Seed Mixes 1, 2, 3, and 5. Sow these seed mixes at a rate of 3 pounds per 1,000 square feet.
   b. Seed Mix 4 (Crownvetch). Sow this seed mix at a rate of 2 pounds per 1,000 square feet. Before sowing, inoculate it in

accordance with manufacturer's directions. Sow this seed mix only from November through August.

3. Water. Water the seeded areas at the completion of the sowing and weekly thereafter until accepted by the Owner.

4. Mulching.

   a. Place straw mulching material evenly over all seeded areas within 48 hours of seeding at a rate of 2 tons per acre between March 15 and October 15 and at a rate of 3 tons per acre between October 16 and March 14.
   b. Secure straw mulching material by approved methods.
   c. When mulching is displaced, replace it and reseed the area; repair other work damaged as a result of mulch displacement.

D. Hydraulic Seeding

1. When seed is applied hydraulically, use a combined slurry of fertilizer, inoculant when required, seed, and wood cellulose fiber mulch in one operation.
2. Increase the inoculant for Seed Mix 4 (Crownvetch) to five times the manufacturer's recommended rate for dry seeding.
3. Mix wood cellulose fiber at a rate of 1,500 pounds per acre.
4. Mix fertilizer and seed at the rate specified for dry seeding.

3.4 MAINTENANCE

A. **General**. Maintain seeded areas. Fill, grade, and reseed settled and eroded areas. Seeding will not be accepted unless it is alive and healthy.

3.5 DEMONSTRATION

A. **Seeded Area**. Before final acceptance the seeded area shall have:

1. A minimum of 100 grass plants per square foot and less than 2 percent bare spots over the entire area.
2. No individual bare spots larger than 6 square inches

END OF SECTION

SECTION 33 05 01

CONNECTIONS TO EXISTING MAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. **General**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Provide the labor, tools, equipment, and materials necessary to accomplish connections to pipelines and sewers in service in accordance with the plans and as specified herein.

1.3 QUALITY ASSURANCE

A. **Codes and Regulatory Agencies**. Perform all work in compliance with all federal, state, and local codes and regulatory agencies.

1.4 **SUBMITTALS** (Not used.)

1.5 JOB CONDITIONS

A. **Notification**. Notify the Owner at least 2 working days in advance and all affected users at least 24 hours in advance of shutoffs. The notification shall include planned starting time and duration of interruption in service. The time and duration of interruption of service must be approved by the Owner.

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used.)

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS (Not applicable.)

PART 3 - EXECUTION

3.1 CONNECTING TO EXISTING UTILITIES AND STRUCTURES

A. Examination

1. Verification of Conditions. Verify the location and elevation of required construction. Confirm that conditions are acceptable to begin construction of work covered in the specification. Complete coordination with other construction or operation activity on the same facility or area. Expose all existing pipes within the work area to permit confirmation of pipe sizes, all required dimensions, elevations, precise locations, and materials of construction prior to ordering new materials and not less than 7 working days prior to date planned for actual connection.

B. Main Connection

1. Sequence of Work.

   a. Complete as much work as possible before making connections. New mains must be blocked, tested, sterilized, and approved prior to connecting to existing mains.
   b. Coordinate the work so that all labor, materials, tools, and equipment are on the site at the start of the work.
   c. Work continuously (24 hours per day, 7 days per week) until service is restored.
   d. Schedule the work to correspond with minimum flows, such as nights and weekends, to minimize inconvenience to customers.

2. Disinfection. Disinfect contaminated potable water pipe in accordance with Section 01 89 19, "Leakage Test and Disinfection."

3. Testing. Test the connection before backfilling.

4. Refilling. Refill the pipe from the system and evacuate all air through hydrants and air releases.

5. Demonstration. Comply with requirements of Section 33 05 30 Item 3.3.

END OF SECTION

SECTION 33 05 23.13

DIRECTIONAL DRILLING PRESSURE PIPE INSTALLATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. **Directional drilling including all work necessary** for the directional drilling installation of pressure pipe. Provide services in accordance with the best industry practice and these specifications. Furnish all labor, equipment, and materials necessary to accomplish the work.

1.3 QUALITY ASSURANCE

A. **At all times provide and maintain** instrumentation which will accurately locate the pilot hole and measure drilling fluid flow discharge rate and pressure.

B. **Provide hydraulic pressure regulations** of load sensor between pulling equipment and pipe.

C. **Engineer shall have access** to instruments, gauges, and readings at all times.

D. **Provide "as-built"** data including horizontal and vertical location of pipe line at 50-foot intervals.

1.4 SUBMITTALS

A. **Prior to commencing directional drilling**, submit details of equipment and detailed working drawings describing the proposed method of directional drilling. This shall include arrangement of equipment, location, and size of drilling and receiving pits, method of dewatering, method of removing spoils material, size and capacity of equipment, method of installing carrier pipe, method of fusing pipe segments, type of cutting head, method of installing detection wire, carrier pipe end seals, support segments, method of monitoring and controlling line and grade, and method of abandonment of pilot hole. Sufficient material shall be submitted to show compliance with the Contract Documents and to show that articles proposed for use in the work are acceptable.

All drawings, catalog cuts and other descriptive data covering several related items in the same system shall be submitted at the same time in order that their complete integrated applicability in the entire system be adequately reviewed.

B. **Bentonite/drilling mud**; product information, material specifications, handling procedures, special precautions required, and method of mixing and installation.

1.5 **JOB CONDITIONS** (Not used.)

1.6 **DEVLIVERY, STORAGE, AND HANDLING** (Not used.)

1.7 **SPECIAL WARRANTY** (Not used.)

PART 2 - PRODUCTS

2.1 **HORIZONTAL DIRECTIONAL DRILLING EQUIPMENT**. All equipment required to install pipe line in accordance with the drawings and specifications.

2.2 **TRACING WIRE**. No. 6 insulated copper wire.

2.3 **DRILLING FLUIDS**. Provide drilling fluid meeting all environmental regulations which provide lubrication to the pipe, annular flushing of the bore hole, and stability and support to the bored hole.

PART 3 - EXECUTION

3.1 DIRECTIONAL TOLERANCE

A. **Drill pilot hole** along the path shown on the Plan and Profile drawing to the following tolerances:

1. Horizontal and Vertical Alignment. Plus or minus 6 inches.
2. Curve Radius. Contractor shall confirm radius curvatures required to accomplish the installation prior to initiation of work.

3.2 REAM AND PULL BACK

A. **Prereaming**. Prereaming operations shall be conducted at the discretion of the horizontal drilling contractor. All provisions of this specification relating to the simultaneous reaming and pulling back operations shall also pertain to prereaming operations.

B. **Pulling Loads**. The maximum allowable tensile load imposed on the pipeline pull section shall not exceed that recommended by the pipe manufacturer.

C. **Torsional Stress**. Provide a swivel to connect the pull section to the reaming assembly to minimize torsional stress imposed on the section.

D. **Pull Section Support**. Support the pull section as it proceeds during pull back so that it moves freely.

E. **Pull four tracing wires** along with the carrier pipe.

F. **Pull back in one continuous operation**. Notify engineer of any pull back which is resumed.

3.3 DRILLING FLUIDS

A. **Disposal**. Disposal of drilling fluids shall be in compliance with all relative environmental regulations, right-of-way and work space agreements.

B. **Inadvertent Returns**. Minimize drilling fluid returns at locations other than the entry and exit points. Clean up any inadvertent returns.

3.4 COMPLETION OF INSTALLATION

A. **After installation of the force main** is complete, restore drilling and receiving pits to equal or better condition than originally found.

END OF SECTION

SECTION 33 05 30

PRESSURE PIPE, FITTINGS, AND VALVES, INSTALLATION

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, and all related specification sections, apply to this section.

1.2 DESCRIPTION OF WORK

A. **Scope of Work**. Provide the labor, tools, equipment, and materials necessary to install the pipe and fittings in accordance with the drawings and specifications. The work includes, but is not limited to, the following:

1. Excavation, preparation of the trench bottom and bedding.
2. Shoring and bracing.
3. Piping beginning at the outside face of structures or building foundations, unless specifically included under other sections.
4. Piping beneath structures.
5. Installation of supports, restraints, and thrust blocks.
6. Work on existing buried pipelines.
7. Installation of all joints, fittings, specials, couplings, adapters, sleeves, tie rods, jointing and gasketing materials, and all other work required to complete the piping installation.
8. Valves, gates, and specials shown or specified for the piping systems.
9. Testing and disinfection.
10. Cleaning.
11. Trench maintenance.

1.3 QUALITY ASSURANCE

A. **Standards**. Conform all materials and workmanship with the following standards.

1. AASHTO – American Association of State Highway and Transportation Officials.
2. ANSI – American National Standards Institute.
3. ASTM – American Society for Testing and Materials.
4. AWWA – American Water Works Association.
5. PPI – Plastic Pipe Institute.

B. **Trench Maintenance**. Be responsible for the condition of the trenches for a minimum period of year from the date of the final acceptance, which must include the period of November 1 to the following April 30. Extend the contract bond to cover the entire trench maintenance period.

1.4 **SUBMITTALS**. Submit all submittals in accordance with the Division 1 Submittal Requirements and this specification section.

A. Submittal Package No. 1 – Backfill Product Data

1. Product data noting each material source, location, sieve analysis, and other information which will show that the source and supplier are capable of furnishing materials meeting the requirements of these specifications. Include name and location of all borrow pits. Product data is required for the following:

   a. Granular pipe bedding.
   b. Granular backfill.

1.5 **JOB CONDITIONS.** Provide all water required for testing, cleaning, and flushing at no additional cost to the Owner. Do not pressure-test polyvinyl chloride (PVC) and polyethylene (PE) pipe when the temperature of the pipe is over 80 degrees Fahrenheit (° F.).

1.6 DELIVERY, STORAGE, AND HANDLING

A. General

1. Delivery, storage, and handling shall be in accordance with Section 01 60 00, "Materials and Equipment."
2. Reject pipe, fittings, and accessories that are cracked, damaged, or in poor condition, or have damaged linings.
3. Pipe handled on skidways shall not be skidded or rolled against other pipe.
4. Protect PVC or PE pipe from exposure to heat or direct sunlight (ultraviolet rays).

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 GENERAL

A. **Pipe and Fittings**. Conform all buried piping, fittings, and joints to the drawings and requirements specified in the corresponding section for each type of pipe installed.

B. Manufacturer

1. All new buried piping of one material shall be by a single manufacturer.
2. All buried fittings of one material shall be by a single manufacturer.
3. All pipe and fittings manufactured outside the United States shall be certified to ISO 9001:2000 standards for quality assurance.

C. Identification

1. Factory-mark or cast all pipe and fittings 4 inches in diameter and larger with the pipe size, material, and class or schedule on the exterior pipe surface.
2. Factory-mark all piping less than 4 inches in diameter with the pipe size, material, and class or schedule on the exterior pipe surface.

2.2 BACKFILL

A. **Granular Pipe Bedding**. Crushed stone or gravel meeting the following requirements:

Nominal Pipe Size	AASHTO M43 Size
Less than 16 "	67, 7 or 8
Greater than 16"	6 or 67

B. **Selected Excavated Trench Material**. Free from cinders, refuse, organic material, boulders, rocks, frozen material, or other material which in the opinion of the Engineer is unsuitable.

C. **Plastic Pipe Backfill**. In addition to the specified material and installation requirements noted elsewhere in this specification, the particle size of material in contact with the plastic pipe shall not exceed the following: ½ in for pipe under 4 inches in diameter, ¾ inches for pipes between 6 to 8 inches in diameter, 1 inch for pipes 10 to 16 inches in diameter; and 1 ½ inches for larger pipes.

D. **Excavated Trench Material**. Free from frozen earth, debris, or earth with an exceptionally high void content.

E. **Granular Backfill**. Granular backfill materials shall be gravel, crushed gravel, crushed stone, or sand meeting the following grading requirements:

Sieve	Total Percent Passing
2-1/2 inch	100
1 inch	70 – 100
No. 4 (3/16 inch)	25 – 100
No. 40	10 – 50
No. 200	5 – 15

The fraction passing a No. 40 sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 6.

PART 3 - EXECUTION

3.1 PREPARATION

A. Verification of Conditions

1. Verify the location and elevation of required construction.
2. Confirm that conditions are acceptable to begin construction of the work covered in the specification.
3. Coordinate with other construction or activities in the same facility or area.

B. **Safety**. For the security and safety of persons in and adjacent to trenches or construction operations, follow the safety regulations of the appropriate federal, state, and local agency.

C. Dewatering

1. Should water be encountered, furnish and operate suitable pumping equipment of adequate capacity to dewater the trench.
2. Sufficiently dewater the trench so that the laying and joining of the pipe is in the dry.
3. Convey all trench water in accordance with the requirements contained in the National Pollutant Discharge Elimination System (NPDES) program.
4. Convey all trench water to a natural drainage channel or storm sewer without causing any property damage.

D. **Construction Equipment**. Where mains are located in or adjacent to pavements, all backfilling and materials handling equipment shall have rubber tires. Use crawler equipment only where there is no danger of damaging pavement.

E. **Noise, Dust, and Odor Control**. Conduct construction activities so as to eliminate all unnecessary noise, dust, and odors. Do not use oil or other materials for dust control which may cause tracking.

3.2 INSTALLATION

A. Protection of Trees

1. Take special care to avoid damage to trees and their root systems.
2. Do not use machine excavation when, in the opinion of the Engineer/Architect, it would endanger the tree.
3. Where the line of trench falls within the limits of the limb spread, headers are required across the trench to protect the tree.
4. Conduct the operation of all equipment (particularly when employing booms), the storage of materials, and the deposition of excavation in a manner which will not injure trees, trunks, branches, or their roots unless such trees are designated for removal.

B. **Excavation and Construction Materials**.

1. Place all excavated material and all construction materials used in the work so as not to endanger the work, annoy the public, or interfere with natural drainage courses.
2. During the process of the work, maintain all material piles in a neat, workmanlike manner.

C. Trench Support

1. Unsupported open cut trenches will not be permitted where they may cause unnecessary damage to pavement, trees, structures, poles, utilities, or other private or public property.
2. During the progress of the work, support the sides of the excavation by adequate and suitable sheeting, shoring, bracing, or other approved means.
3. Remove trench support material and equipment when backfilling operations have progressed to the point where they may be withdrawn without endangering property.
4. In lieu of removing all the sheeting, you may cut off the sheeting 2 feet above the top of the pipe and remove the upper portion.
5. If all the sheeting is to be removed, remove it without causing damage to the pipe.
6. No sheeting, shoring, or bracing will be paid for by the Owner unless remaining in place on written order of the Engineer/Architect. In this case, payment will be made in accordance with the General Conditions.

D. Trench Excavation and Bottom Preparation

1. Trench Width. Hold widths of trenches to a minimum to accommodate the pipe and appurtenances. Measure the trench width at the top of the pipe barrel and shall conform to the following limits:

   a. Pipe.

	Earth
Minimum	Outside diameter of the pipe barrel plus 8 inches, i.e., 4 inches each side
Maximum	Nominal pipe diameter plus 24 inches

Rock

	Nominal Pipe Diameter 24 inches or less	**Nominal Pipe Diameter Larger than 24 inches**
Minimum	Outside diameter of the pipe barrel plus 12 inches, i.e., 6 inches each side	Outside diameter of the pipe barrel plus 18 inches, i.e., 9 inches each side
Maximum	Nominal pipe diameter plus 24 inches	Nominal pipe diameter plus 24 inches

b. Structures. The minimum excavation limits for structures shall be as excavated. In rock, the excavation limits shall not exceed 12 inches from the outside wall and 6 inches below the footer.

c. Excessive Trench Width. If for any reason the trench width exceeds the maximum trench width defined in this section, provide granular pipe bedding, additional strength pipe, or concrete encasement, at no cost to the Owner and subject to acceptance.

2. Trench Depth.

a. Earth.

1) Excavate the trench to the depth required.
2) Provide a uniform and continuous bearing and support for the pipe barrel on solid and undisturbed ground at every point between joints.
3) It will be permissible to disturb the finished trench bottom over a maximum length of 18 inches near the middle of each length of pipe for the withdrawal of lifting tackle.
4) Provide bell holes.
5) Accurately prepare the finished trench bottom by means of hand tools.

b. Rock.

1) Where excavation is made in rock or boulders, excavate the trench 6 inches below the pipe barrel for pipe 24 inches in diameter or less, and 9 inches for pipe larger than 24 inches in diameter.
2) Remove all loose material from the trench bottom.

3. Rock Excavation.

a. Rock excavation is defined as the removal of:

1) Unanticipated solid concrete (excluding pavements), unanticipated solid masonry, or boulders each of which has a volume greater than 1 cubic yard.
2) Bedrock which requires for its removal drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool.

b. Rock excavation is not excavating:

1) Existing concrete or masonry structures or pavements shown.
2) Material which can be excavated using an appropriately sized, heavy-duty, power-operated excavator, backhoe, or shovel, all of which are equipped with bucket-mounted ripping teeth.
3) Material that can be excavated with a hand pick and shovel.
4) Soft or disintegrated bedrock such as weathered shale, clay shale, claystone, or mudstone, or overconsolidated soils such as "hardpan."
5) Previously blasted materials or materials that are intermittently drilled and blasted to merely increase production.

c. Blasting Rock. Do not blast rock unless approved.

E. Pipe, Fittings, and Valve Installation

1. Pipe Laying.

a. Lay pipe with bell ends facing in the direction of laying, unless otherwise directed.
b. After placing a length of pipe in the trench, center the spigot end in the bell and force the pipe home.
c. Lay all pipe with ends abutting and true to line and grade.
d. Deflection of pipe joints in excess of the manufacturer's recommendations will not be permitted.
e. Provide a watertight pipe plug or bulkhead to prevent the entrance of foreign material whenever pipe laying operations are not in progress.
f. Inspect cast metal pipe and fittings for cracks by ringing the pipe with a light hammer while it is suspended.

2. Pipe Cutting.

   a. Cut pipe in a neat and workmanlike manner without damage to the pipe or lining.
   b. The end shall be smooth and at right angles to the axis of the pipe.
   c. Flame cutting of metal pipe by means of an oxyacetylene torch will not be permitted.

3. Push-On Joints.

   a. Thoroughly clean the surfaces with which the rubber gasket comes in contact just before assembly.
   b. Then insert the gasket into the groove in the bell.
   c. Before starting joint assembly, apply a liberal coating of special lubricant to the spigot end.
   d. With the spigot end centered in the bell, push the spigot end home.

4. Mechanical Joints.

   a. Center the spigot in the bell.
   b. Thoroughly clean the surface with which the rubber gasket comes in contact just before assembly.
   c. Brush these clean surfaces with a special lubricant just before slipping the gasket over the spigot end and into the bell.
   d. Also brush the lubricant over the gasket before installation to remove the loose dirt and lubricate the gasket as it is forced into its retaining space.

5. Restrained Joints.

   a. Ball and Socket or Push-On. Assemble and install the ball and socket joint according to the manufacturer's recommendations. Thoroughly clean and lubricate the joint. Check the retainer ring fastener.

6. Joints between Dissimilar Pipe Materials. Make connections to pipe of different materials with adaptors designed to join those materials.

7. Setting Valves.

   a. Set valves on a firm foundation so that no load will be transferred to the connecting pipe.
   b. Provide a valve box for every buried valve.
   c. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve.
   d. Set the box cover flush with the surface of the finished pavement unless otherwise shown.

8. Anchoring. Provide all plugs, caps, tees, and bends with a concrete backing. If shown or specified, prevent movement by attaching suitable metal rods, clamps, or restrained fittings.

   a. Concrete Backing.

      1) Concrete backing shall be Design Mix A concrete as specified in Section 03 30 00, "Cast-In-Place Concrete."
      2) Place backing between undisturbed ground and the fitting to be anchored.
      3) The area of bearing on the fitting and on the ground shall be as shown.
      4) Place the backing, unless otherwise shown, so that the pipe and fitting joints will be accessible for repair.

   b. Tie Rods.

      1) Place steel tie rods or clamps, where permitted, of adequate strength to prevent movement.
      2) Paint steel tie rods or clamps with three coats of an approved bituminous paint or coal tar enamel.

   c. Restrained Fittings. Restrained fittings shall be subject to the acceptance of the Engineer/Architect.

F. **Trench Backfill**. Backfill all trench excavations immediately after pipe is laid as shown and specified.

1. Foundation.

   a. Build the mains on a good foundation.
   b. If, in the Engineer/Architect's opinion, the material forming the trench bottom is not suitable for a good foundation, replace it with granular pipe bedding as directed.
   c. Authorized excavation and restoration of the foundation below the trench bottom will be paid for in accordance with the General Conditions.
   d. Fill unauthorized excavation below the trench bottom with pipe bedding at no cost to the Owner.

2. Pipe Bedding.

   a. Install all plastic or fiberglass-reinforced plastic (FRP) pipes with a 6-inch-deep sand pipe bed.
   b. Install all other pipe materials with no pipe bed unless foundation is rock.
   c. For rock foundations, provide a 6-inch granular pipe bed between rock and pipe for pipes 24 inches in diameter or less and

a 9-inch granular pipe bed for pipes larger than 24 inches in diameter.

d. Spread granular pipe bedding the full width of trench bottom.

3. Haunching.

   a. Use compacted selected excavated trench material unless noted otherwise.
   b. Place in uniform 6-inch loose layers and compact each layer to eliminate the possibility of settlement, pipe misalignment, or damage to joints.

4. Initial Backfill.

   a. Use selected excavated trench material unless noted otherwise.
   b. Take care to avoid injuring or moving the pipe.

5. Final Backfill.

   a. Use excavated trench material unless noted otherwise.
   b. Use mechanical equipment to place the backfill.
   c. Do this in such a manner that the material does not free fall, but so that it will flow onto the previously placed material.
   d. Consolidate the backfill to ensure the minimum possible settlement.
   e. No compacting of the backfill with mechanical equipment, such as wheeled vehicles, will be permitted unless sufficient cover is provided over the pipe to prevent damage to the pipe.

6. Granular Backfill. When backfilling under pavements, driveways, or as directed, use granular backfill in place of the selected excavated trench material and the excavated trench material.

7. Backfill trenches with Class C concrete where trench excavations pass within 18 inches of column or wall footings and that are carried below bottom of such footings or that pass under wall footings. Place concrete to level of bottom of adjacent footing.

8. Provide 4-inch-thick concrete base slab support for piping or conduit less than 2'-6" below surface of roadways. After installation and testing of piping or conduit, provide minimum 4-inch-thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

9. Bulkheads.

   a. When granular bedding or backfill is provided, place bulkheads of clay soil across the trench at 100 foot intervals to resist the movement of groundwater through the granular material.
   b. Carefully compact the bulkheads and extend them approximately 3 feet in the direction of the pipe and from the bottom of the trench to a height of 6 inches above the top of the pipe barrel.

10. Surface Conditions. Periodically attend to the trench surface during the course of the Contract. Maintain the trench surface in a safe condition and not interfering with natural drainage.

3.3 **CLEANING**. After a section of main is tested and accepted, clean the ground surface of all surplus material including stone, broken pipe, construction material, and all other debris.

3.4 DEMONSTRATION

A. **Leakage Test and Disinfection**. In accordance with Section 01 89 19, "Leakage Test and Disinfection."

B. **Visual**. With Owner and/or Engineer/Architect, visually review the main installation for completion. Demonstrate that all main materials and appurtenances are in conformance with the Contract Documents.

C. **Final Acceptance**. The visual demonstration for completion of the main installation shall not be considered as final acceptance of the work. Correct all discrepancies "punch listed" at final inspection to the satisfaction of the Engineer/Architect and Owner.

3.5 **PROTECTION**. Protect the main appurtenances (valves, hydrants, etc.) from damage during subsequent construction operations. Remove any and all protection at the completion of the project.

END OF SECTION

SECTION 33 05 33

PRESSURE PIPE AND FITTINGS, DUCTILE IRON

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, Section 33 05 30, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to furnish and install the buried ductile iron pipe and fittings in accordance with the drawings and specifications. See Section 40 05 13.53, "Process Piping, Ductile Iron" for exposed flanged ductile iron piping.

1.3 **QUALITY ASSURANCE.** In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.4 **SUBMITTALS.** Submit the following submittal packages in accordance with section 01 33 00, "Submittals." Both packages shall be submitted, reviewed, and approved before installation of the pipe.

A. Submittal Package No. 1 – Pipe Material and Testing Data

1. Certification of compliance with the referenced standards.
2. Description of proposed testing methods, procedures, and apparatus.
3. Manufacturer's product data clearly marked for this specific project showing materials, sizes, thicknesses, pressure ratings, coatings, and joint configuration strengths.

1.5 **JOB CONDITIONS.** In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.6 **DELIVERY, STORAGE, AND HANDLING.** In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.7 **SPECIAL WARRANTY.** (Not used.)

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Ductile Iron Pipe**. Ductile iron pipe shall meet the requirements of ANSI/AWWA C151/A21.51, "Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids."

1. Material. The chemical constituents shall meet the physical property recommendations of ASTM A 536, "Ductile Iron Castings," to ensure that the iron is suitable for satisfactory drilling and cutting.

2. Minimum Thickness.

a. Unless otherwise shown, the minimum thickness of the barrel of the pipe shall be:

Size	Thickness Class
3" – 12"	53

b. Unless otherwise shown, the minimum thickness of the barrel of restrained ball and socket joint pipe (river crossing) shall be:

Size	Thickness Class
4" – 6"	54
8" – 12"	55
14" – 24"	56
30" – 36"	57

3. Coating and Lining.

a. General. Unless noted otherwise, coat the pipe exterior with a bituminous coating in accordance with ANSI/AWWA C151/A21.51, "Ductile Iron Pipe, Centrifugally Cast, for Water or Other Liquids," and lined inside with cement mortar and seal coated in accordance with ANSI/AWWA C104/A21.4, "Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water."

B. **Ductile Iron Fittings**. Ductile iron standard and special fittings shall conform to ANSI/AWWA C110/A21.10, "Ductile Iron and Gray Iron Fittings," or ANSI/AWWA C153/A21.53, "Ductile Iron Compact Fittings."

1. Working Pressures. Fittings shall be suitable for the following working pressures unless otherwise noted:

Sizes	Pressure (psi) Gray Iron	Pressure (psi) Ductile Iron
2" – 12"	250	
14" – 48"	150	
3" – 24"		350
30" – 48"		250

2. Coating and Lining.

a. General. Unless noted otherwise, coat the fittings exterior with a bituminous coating in accordance with ANSI/AWWA C110/A21.10, "Ductile Iron and Gray Iron Fittings," or ANSI/AWWA C153/A21.53, "Ductile Iron Compact Fittings," and lined inside with cement mortar and seal coated in accordance with ANSI/AWWA C104/A21.4, "Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water."

C. Joints

1. Push-On and Mechanical (Including Restrained Joints). Push-on and mechanical joints including accessories shall conform to ANSI/AWWA C111/A21.11, "Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings." Bolts shall be high-strength low-alloy steel tee head with hex nuts.

2. Flanged. Do not use flanged joints in underground installations except where specified or shown. See Section 40 05 13, "Process Piping, General," for more information on flanged joints.

3. Ball and Socket. Ball and socket joints (river crossing) shall be restrained, boltless, and capable of deflecting up to 15 degrees. The bell, ball, and retainer shall be cast of ductile iron. The gasket shall be of high quality rubber.

4. Gaskets.

    a. Air and gas piping shall have high-temperature-type gaskets, rated to 300 degrees Fahrenheit (° F.). Material shall be a fluoroelastomer (FKM).
    b. All gasket types shall be suitable for the material being conveyed.

5. Restrained.

    a. Allowable only where shown or approved.

    b. Rated at the pressure rating of the pipe with a safety factor of 2.

    c. Coat any exposed ferrous surfaces in accordance with AWWA C550. Alternatively, coat the casting body with a TGIC polyester and the wedges and wedge actuators with a fluoropolymer.

    d. Any bolts shall be high strength low-alloy steel tee head with hex nuts.

    e. Subject to compliance with the specifications, provide a restrained joint system from one of the following approved manufacturers.

        1) Ebaa Iron (3-48-inch diameter [dia.]).
        2) Smith Blair (3-24-inch dia.).
        3) Romac Industries (3-24-inch dia.).
        4) Star Pipe (3-48-inch dia.).

D. **Polyethylene Encasement**. Where noted, encase the pipe and fittings with polyethylene film conforming to ANSI/AWWA C105/A21.5, "Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids."

PART 3 - EXECUTION. Install all pipe and fittings in conformance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves Installation."

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END OF SECTION

SECTION 33 05 35

PRESSURE PIPE AND FITTINGS, MOLECULARLY ORIENTED POLYVINYL CHLORIDE (C909)

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, Section 33 05 30, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to furnish and install the molecularly oriented polyvinyl chloride (PVCO) pipe and fittings in accordance with the plans and the specifications.

1.3 **QUALITY ASSURANCE**. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.4 **SUBMITTALS**. Submit the following submittal packages in accordance with the Division 1 submittal requirements.

A. Submittal Package No. 1 – Product Data

1. Schedule. No pipe shall be delivered until this submittal is approved.

2. Submittal Package Contents.

a. Certification of compliance with the referenced standards.
b. Manufacturer's product data showing materials, sizes, thicknesses, pressure ratings, coatings, and joint strengths.

1.5 **JOB CONDITIONS**. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.6 **DELIVERY, STORAGE, AND HANDLING**. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 MATERIALS

A. **PVCO Pipe**. PVCO pipe shall meet the requirements of the following AWWA standards.

Pipe Inside Nominal Diameter (inches)	AWWA* Standard
4 to 24	C909

*AWWA – American Water Works Association

1. Unless otherwise shown, the minimum pressure class of the pipe shall be 150 pounds per square inch (psi).
2. The pipe shall have cast iron pipe equivalent outside dimensions for the nominal size indicated.
3. Paint a ring on the plain end of the pipe to facilitate proper positioning during assembly of the joint.

B. **Fittings**. Fittings shall conform to one of the following standards and have a pressure rating equal to or greater than the pipe.

1. Ductile Iron. AWWA C110 or C153. Polyethylene encase all ductile iron fittings furnished for use with PVC pipe in accordance with AWWA C105.
2. Fabricated PVC Fittings. C900 or C905.
3. Injection-Molded PVC Fittings. C907. Only available for DR 25 and DR 18 pipe with diameters between 4 and 12 inches.

C. Pipe Joints

1. Push-On. Conform to ASTM D3139, "Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals."

2. Solvent-Cemented. Solvent-cemented joints are prohibited.

3. Restrained.

   a. Allowable only where shown or approved.
   b. Rated at the pressure rating of the pipe with a safety factor of 2.
   c. Coat any exposed ferrous surfaces in accordance with AWWA C550.
   d. Any bolts shall be high strength low-alloy steel tee head with hex nuts.
   e. Subject to compliance with the specifications, provide a restrained joint system from one of the following approved manufacturers.

      1) Ebaa Iron (3-48-inch diameter [dia.]).
      2) Eagle Lok 900 /Diamond Lok-21 (4-12-inch dia. DR 18 only).
      3) Smith Blair (3-24-inch dia.).
      4) Romac Industries (3-24-inch dia.).
      5) Star Pipe (3-36-inch dia.).
      6) Certa-Lok (4-16-inch dia.).

PART 3 – EXECUTION. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation," and AWWA C605**.**

END OF SECTION

SECTION 33 05 39

PRESSURE PIPE AND FITTINGS, FUSIBLE C900

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS.** Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, Section 33 05 30, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK.** Provide the labor, tools, equipment, and materials necessary to furnish the Fusible C900™ Pipe in accordance with the plans and specifications.

1.3 **QUALITY ASSURANCE**. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.4 **SUBMITTALS.** Submit the following submittal packages in accordance with Section 01 33 00, "Submittals." Both packages shall be submitted, reviewed, and approved before installation of the pipe.

A. Submittal Package No. 1 – Pipe Material and Testing Data

1. Certification of compliance with the referenced standards.
2. Description of proposed testing methods, procedures, and apparatus.
3. Manufacturer's product data clearly marked for this specific project showing materials, sizes, thicknesses, pressure ratings, coatings, and joint configuration strengths.

B. Submittal Package No. 2 – Detailed Drawings and Thrust Calculations

1. Detailed profile drawings for all piping and fittings showing full details of piping, specials, and connections to existing pipes and structures.
2. Thrust restraint design calculations.

1.5 **JOB CONDITIONS.** In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

1.6 **DELIVERY, STORAGE, AND HANDLING.** In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation.

1.7 **SPECIAL WARRANTY.** Obtain a 5-year warranty from the supplier written to the Owner to warrant the material, fusion, and workmanship to be free of defects for a minimum of 5 years.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fusible Pipe

1. Dimensions. Unless otherwise shown, the minimum thickness of the barrel of the pipe shall be Dimension Ratio (DR) 18. The pipe shall have ductile iron pipe equivalent outside dimensions for the nominal size indicated.
2. The material properties of Fusible C900™ are as defined in American Society for Testing and Materials (ASTM) D 1784-02. The cell classification is 12454B.
3. The formulation for extrusion of Fusible C900™ shall meet the requirements of PPI TR-2.
4. The pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer.
5. Any scratch or gouge greater than 10 percent of the wall thickness will be considered significant and be rejected from the project.

B. **Fittings**. Fittings shall conform to one of the following standards and have a pressure rating equal to or greater than the pipe.

1. Ductile Iron. AWWA C110 or C153. Polyethylene encase all ductile iron fittings furnished for use with PVC pipe in accordance with AWWA C105.

C. Testing

1. Fusible C900™ pipe is tested at the extrusion facility for the pipe properties required to meet American Water Works Association (AWWA) Standards for C900. These include:

   1-1 Dimensional checks
   1-2 Acetone immersion
   1-3 Flattening
   1-4 Burst pressure.

2. Tests during extrusion will be done at the frequency as determined by AWWA Standards C900.

3. For each extrusion run, the test results will be summarized and reported.

PART 3 – **EXECUTION.** In accordance with Section 33 05 30, “Pressure Pipe, Fittings, and Valves, Installation.” Install fusible pipe following manufacturer's instructions and requirements.

END OF SECTION

SECTION 33 12 16

BURIED VALVES

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to furnish and install the buried valves in accordance with the plans and specifications.

1.3 **QUALITY ASSURANCE**. Materials and workmanship shall be in accordance with the following standards as referenced herein.

A. **AWWA** – American Water Works Association.

B. **ASTM** – American Society for Testing and Materials.

1.4 SUBMITTALS

A. **General.** Submit all required documents and materials in accordance with Section 01 33 00 and this section.

B. **The following submittal content and schedule requirements** are required to be submitted when indicated by the individual valve specifications.

1. Shop Drawings and Product Data.

a. Schedule. No other submittal packages related to this equipment can be approved before this one.

b. Submittal Package Contents.

1) Manufacturer's name.
2) Body, seating, and trim materials.
3) Dimensions.
4) Connection details.
5) Required clearances.
6) Parts list with materials and part numbers for the valves and accessories.
7) Maximum operating pressure and temperature ratings.
8) Manufacturer's instructions.
9) Certificate of compliance and proof of design with AWWA standards.

2. Operation and Maintenance (O&M) Manuals.

a. Schedule. Submit the initial review copy of the O&M manual and the revised copies prior to delivery of the equipment.
b. Submittal Package Requirements. O&M manuals in accordance with Section 01 33 00.

1.5 **JOB CONDITIONS** (Not used)

1.6 **DELIVERY, STORAGE, AND HANDLING** (Not used)

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 - PRODUCTS

2.1 BURIED VALVES

A. **Resilient Wedge Gate Valves**.

1. Manufacturer. Subject to compliance with the specifications, provide the resilient wedge gate valves from one of the following approved manufacturers.

a. American Flow Control (2 inches – 48 inches).
b. McWane Inc. including Clow, Kennedy, American R/D, and M&H Valve Company (2 inches – 48 inches).
c. American AVK (2 inches – 24 inches).
d. Mueller (2 inches – 48 inches).
e. US Hydrant and Valve (2 inches – 48 inches).

2. Performance.

a. All resilient wedge gate valves shall have openings through the body of the same circular area as that of the pipe to which they are attached.

b. Valves shall have mechanical joint ends unless otherwise shown on the plans or directed otherwise by the Engineer/Architect.

c. Valve Design Pressure.

1) Valves shall be designed for a working pressure of 250 psi unless otherwise noted.
2) Each valve shall be given a bidirectional hydrostatic seat test with the test results being certified by the manufacturer.

d. Valves shall be furnished with a 2-inch square wrench nut.

e. Valves shall open “right” or “clockwise.”

3. Materials.

Part	Material
Valve Body	Cast or ductile iron
Wedges	ASTM A 536, Grade 65-45-12 high-strength ductile iron or one-piece A 126 cast iron; completely encapsulated with permanently bonded SBR or EPDM rubber.
Nuts and Bolts	Type 316 Stainless Steel
Stem and Stem Nuts	Bronze
Packing Seal	Rubber “O” Ring

4. Fabrication and Assembly.

   a. In accordance with AWWA C509 or C515.
   b. Nonrising stems.
   c. Valve stem seals shall be three O-rings.
   d. Packing arrangement shall utilize two sets of packing.
   e. Furnished with two low-torque thrust bearings.
   f. An extension stem shall be furnished, if required, to bring the operating nub within 3-1/2 feet of finished grade. Extension stem shall be securely fastened to the valve stem.
   g. Contractor shall make all valves tight under their working pressures after they have been placed and before the main is placed in operation.

B. **Valve Boxes**. Provide all buried valves with valve boxes. Valve boxes shall be of standard, adjustable, heavy pattern, cast iron extension type, three piece, 3-1/4-inch shaft, screw type, and of such length as necessary to extend from valve to finished grade. Set tops at established grade, and the valve box cover marked with either "water" or "sewer" as applicable.

Valve Size	Base
10" through 16"	Oval, 9-1/2" in height, 21" by 12-1/2" diameter at bottom

C. **Valve Wrench**. Provide a valve wrench of sufficient length shall be provided for every five valves or less furnished.

PART 3 - EXECUTION

3.1 **INSTALLATION**. In accordance with Section 33 05 30, "Pressure Pipe, Fittings, and Valves, Installation."

END OF SECTION

SECTION 33 12 19.01

FIRE HYDRANTS

PART 1 – GENERAL

1.1 **RELATED DOCUMENTS**. Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1, Section 33 05 30, and all related specification sections, apply to this section.

1.2 **DESCRIPTION OF WORK**. Provide the labor, tools, equipment, and materials necessary to furnish and install the fire hydrants in accordance with the plans and the specifications.

1.3 **QUALITY ASSURANCE**. Material and workmanship shall be in accordance with the following standards:

A. **American National Standards Institute**. ANSI.

B. **American Water Works Association**. AWWA.

1.4 **SUBMITTALS**. Submit the following submittal package in accordance with the Division 1 Submittal Requirements.

A. Submittal Package No. 1 – Product Data

1. Schedule. No fire hydrants shall be delivered to the site until this package has been approved.
2. Submittal Package Contents. Product data.

1.5 JOB CONDITIONS

A. **Single Manufacturer**. Obtain all fire hydrants from the same manufacturer.

1.6 **DELIVERY, STORAGE, AND HANDLING**. In accordance with Section 01 60 00, "Materials and Equipment."

1.7 **SPECIAL WARRANTY** (Not used)

PART 2 – PRODUCTS

2.1 MATERIALS

A. Fire Hydrants

1. Conform to ANSI/AWWA C502, "Dry-Barrel Fire Hydrants."
2. The hydrants shall have a 6-inch mechanical joint inlet connection, a 5-1/4-inch main valve opening, two 2-1/2-inch hose nozzles and one 4-inch pumper nozzle. All outlet nozzles shall have Akron Standard Threads.

3. Furnish with a bury length necessary to install the hydrant at the requireddepth of cover.
4. Operating Nut. 1-1/2-inch pentagon.
5. Traffic-rated and self-draining.
6. Direction of Opening. Left or Counterclockwise.
7. Color shall be hydrant red unless noted or directed otherwise.
8. 250-pound-per-square-inch (psi) maximum working pressure.
9. 500-psi minimum static test pressure.
10. Furnish hydrants complete with hydrant cap chains for all nozzles.
11. Subject to compliance with the specifications, all hydrants must be fromone of the following approved manufacturers.

    a. Mueller Centurion, Model A-423.
    b. East Jordan Iron Works 6" BR.

B. **Hydrant Wrench**. Provide one 15-inch-long hydrant wrench with each five firehydrants or fewer furnished.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Setting Hydrants

1. Locate hydrants as shown.
2. The location shall provide complete accessibility and minimize thepossibility of damage from vehicles or injury to pedestrians.
3. When placed behind the curb, set the hydrant barrel so that no portion ofthe pumper or hose nozzle cap will be less than 12 inches from the gutterface of the curb.
4. Stand all hydrants plumb with the pumper nozzle facing the curb.
5. Set hydrants having two hose nozzles 90 degrees apart with each nozzlefacing the curb at an angle of 45 degrees.
6. Set hydrants to the established grade, with nozzles at 12 inches above theground.
7. Unless otherwise shown, connect each hydrant to the main with a 6-inchbranch connection controlled by an independent 6-inch gate valve.

B. Sump

1. Excavate a sump 2 feet in diameter and 2 feet deep below each hydrant.
2. Fill sump with granular pipe bedding; compact under and around the shoe of the hydrant and to a level of 6 inches above the waste opening.
3. Do not connect any drainage sump to a sanitary sewer.

C. **Laying, Backfill, and Anchoring**. In accordance with Section 33 05 30,"Pressure Pipe, Fittings, and Valves, Installation," and the drawings.

END OF SECTION