12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.1 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC
American Council of Engineering Companies

ASCE American Society of Civil Engineers

National Society of Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
A Practice Division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Endorsed by

CONSTRUCTION SPECIFICATIONS INSTITUTE

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anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,

      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

SECTION 00 61 16

PAYMENT BOND (EJCDC C-615)

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*: City of Flint, Department of Purchases and Supplies
1101 S. Saginaw Street, Room 203
Flint, MI 48502

CONSTRUCTION CONTRACT

Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND

Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within

EJCDC
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SECTION 00 61 13

PERFORMANCE BOND (EJCDC C-610)

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*: City of Flint, Department of Purchases and Supplies
1101 S. Saginaw Street, Room 203
Flint, MI 48502

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount:
Description *(name and location)*:

BOND
Bond Number:
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount:
Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____ *(seal)*	_____ *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	**By:** _____
Signature	Signature *(attach power of attorney)*
_____	_____
Print Name	Print Name
_____	_____
Title	Title
Attest: _____	**Attest:** _____
Signature	Signature
_____	_____
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

United States Environmental Protection Agency

OMB Control No:
Approved:
Approval Expires:

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	**Date**

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name
CJ' S Excavating Septic Service Inc		2019 Phase VI Service Line Replacement
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact
19-558		Jeff Lang
Address 9145 Corunna Road, Flint, MI 48532		
Telephone No. 810-743-6702		Email Address office@langbuild.com
Prime Contractor Name Lang Constructors, Inc.		Issuing/Funding Entity:

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor
221310 237110 235910	City of Flint service line replacement, please use the following link to review bid documents. www.cityofflint.com/purchasing Link can be found under open bids.	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

United States Environmental Protection Agency

OMB Control No:
Approved:
Approval Expires:

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	**Date**

The public reporting and recordkeeping burden for this collection of information is estimated to average three (3) hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name Onyx Enterprise Inc.		Project Name 2019 Phase VI Service Line Replacement
Bid/ Proposal No. 19-558	Assistance Agreement ID No. (if known)	Point of Contact Jeff Lang
Address 9145 Corunna Road, Flint, MI 48532		
Telephone No. 810-743-6702		Email Address office@langbuild.com
Prime Contractor Name Lang Constructors, Inc.		Issuing/Funding Entity:

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor
238910 221310 237110	City of Flint service line replacement, please use the following link to review bid documents. www.cityofflint.com/purchasing Link can be found under open bids.	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

United States Environmental Protection Agency

OMB Control No:
Approved:
Approval Expires:

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	**Date**

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name J Perez Construction Inc.		Project Name 2019 Phase VI Service Line Replacement
Bid/ Proposal No. 19-558	Assistance Agreement ID No. (if known)	Point of Contact Jeff Lang
Address 9145 Corunna Road, Flint, MI 48532		
Telephone No. 810-743-6702		Email Address office@langbuild.com
Prime Contractor Name Lang Constructors, Inc.		Issuing/Funding Entity:

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor
237110 235910	City of Flint service line replacement, please use the following link to review bid documents. www.cityofflint.com/purchasing Link can be found under open bids.	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

EPA United States Environmental Protection Agency

OMB Control No:
Approved:
Approval Expires:

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	**Date**

EPA United States Environmental Protection Agency

OMB Control No: 2090-0030
Approved: 8/13/2013
Approval Expires: 8/31/2015

Disadvantaged Business Enterprise (DBE) Program
DBE Subcontractor Participation Form

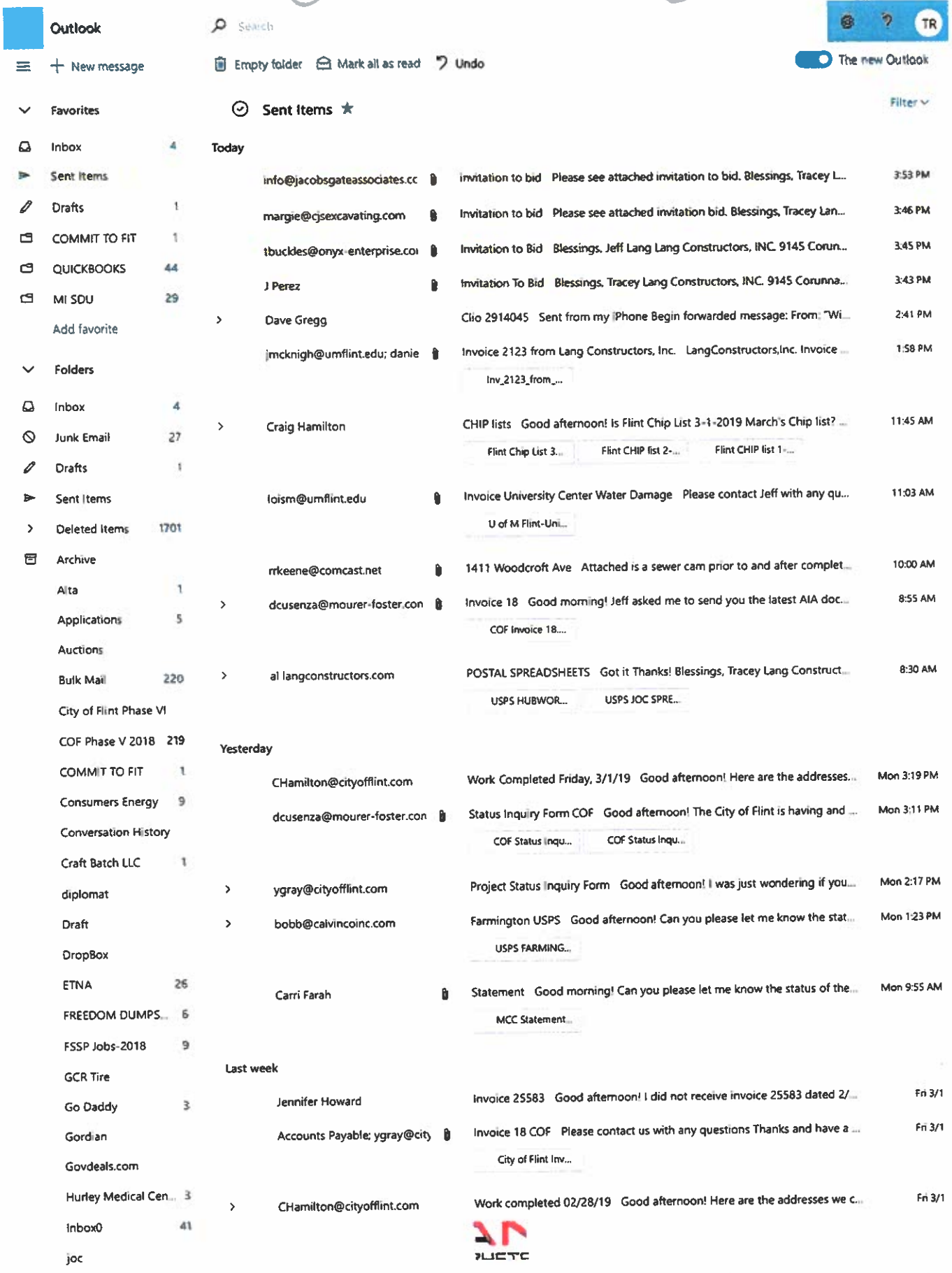
An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name
Jacobs Gate and Associates LLC		2019 Phase VI Service Line Replacement
Bid/ Proposal No. 19-558	Assistance Agreement ID No. (if known)	Point of Contact Jeff Lang
Address 9145 Corunna Road, Flint, MI 48532		
Telephone No. 810-743-6702		Email Address office@langbuild.com
Prime Contractor Name Lang Constructors, Inc.		Issuing/Funding Entity:

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services, Equipment or Supplies	Amount Received by Prime Contractor
221310 237110	City of Flint service line replacement, please use the following link to review bid documents. www.cityofflint.com/purchasing Link can be found under open bids.	

[1] A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

[2] Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



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Favorites

- Inbox 4
- Sent Items
- Drafts 1
- COMMIT TO FIT 1
- QUICKBOOKS 44
- MI SDU 29
- Add favorite

Folders

- Inbox 4
- Junk Email 27
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- Deleted Items 1701
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- Alta 1
- Applications 5
- Auctions
- Bulk Mail 220
- City of Flint Phase VI
- COF Phase V 2018 219
- COMMIT TO FIT 1
- Consumers Energy 9
- Conversation History
- Craft Batch LLC 1
- diplomat
- Draft
- DropBox
- ETNA 26
- FREEDOM DUMPS... 6
- FSSP Jobs-2018 9
- GCR Tire
- Go Daddy 3
- Gordian
- Govdeals.com
- Hurley Medical Cen... 3
- Inbox0 41
- joc

Sent Items ★ Filter

Today

info@jacobsgateassociates.cc	Invitation to bid Please see attached invitation to bid. Blessings, Tracey L...	3:53 PM
margie@cjsexcavating.com	Invitation to bid Please see attached invitation bid. Blessings, Tracey Lan...	3:46 PM
tbuckles@onyx-enterprise.coi	Invitation to Bid Blessings, Jeff Lang Lang Constructors, INC. 9145 Corun...	3:45 PM
J Perez	Invitation To Bid Blessings, Tracey Lang Constructors, INC. 9145 Corunna...	3:43 PM
Dave Gregg	Clio 2914045 Sent from my iPhone Begin forwarded message: From: "Wi...	2:41 PM
jmcknigh@umflint.edu; danie	Invoice 2123 from Lang Constructors, Inc. LangConstructors,Inc. Invoice ... Inv_2123_from_...	1:58 PM
Craig Hamilton	CHIP lists Good afternoon! Is Flint Chip List 3-1-2019 March's Chip list? ... Flint Chip List 3... Flint CHIP list 2-... Flint CHIP list 1-...	11:45 AM
loism@umflint.edu	Invoice University Center Water Damage Please contact Jeff with any qu... U of M Flint-Uni...	11:03 AM
rrkeene@comcast.net	1411 Woodcroft Ave Attached is a sewer cam prior to and after complet...	10:00 AM
dcusenza@mourer-foster.con	Invoice 18 Good morning! Jeff asked me to send you the latest AIA doc... COF Invoice 18....	8:55 AM
al langconstructors.com	POSTAL SPREADSHEETS Got it Thanks! Blessings, Tracey Lang Construct... USPS HUBWOR... USPS JOC SPRE...	8:30 AM

Yesterday

CHamilton@cityofflint.com	Work Completed Friday, 3/1/19 Good afternoon! Here are the addresses...	Mon 3:19 PM
dcusenza@mourer-foster.con	Status Inquiry Form COF Good afternoon! The City of Flint is having and ... COF Status Inqu... COF Status Inqu...	Mon 3:11 PM
ygray@cityofflint.com	Project Status Inquiry Form Good afternoon! I was just wondering if you...	Mon 2:17 PM
bobb@calvincoinc.com	Farmington USPS Good afternoon! Can you please let me know the stat... USPS FARMING...	Mon 1:23 PM
Carri Farah	Statement Good morning! Can you please let me know the status of the... MCC Statement...	Mon 9:55 AM

Last week

Jennifer Howard	Invoice 25583 Good afternoon! I did not receive invoice 25583 dated 2/...	Fri 3/1
Accounts Payable; ygray@city	Invoice 18 COF Please contact us with any questions Thanks and have a ... City of Flint Inv...	Fri 3/1
CHamilton@cityofflint.com	Work completed 02/28/19 Good afternoon! Here are the addresses we c...	Fri 3/1
Amy Sullivan	Clio USPS Invoice Good morning! Thanks Amy! Have a great weekend! B...	Fri 3/1

POWER OF ATTORNEY
UNITED STATES FIRE INSURANCE COMPANY
PRINCIPAL OFFICE - MORRISTOWN, NEW JERSEY

01129408919

KNOW ALL MEN BY THESE PRESENTS: That United States Fire Insurance Company, a corporation duly organized and existing under the laws of the state of Delaware, has made, constituted and appointed, and does hereby make, constitute and appoint:

John Foster, Dan Cusenza, James Slear, Lori King-Clyde, Heather Buonodono

each, its true and lawful Attorney(s)-In-Fact, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver: Any and all bonds and undertakings of surety and other documents that the ordinary course of surety business may require, and to bind United States Fire Insurance Company thereby as fully and to the same extent as if such bonds or undertakings had been duly executed and acknowledged by the regularly elected officers of United States Fire Insurance Company at its principal office, in amounts or penalties not exceeding: **Seven Million, Five Hundred Thousand Dollars ($7,500,000).**

This Power of Attorney limits the act of those named therein to the bonds and undertakings specifically named therein, and they have no authority to bind United States Fire Insurance Company except in the manner and to the extent therein stated.

This Power of Attorney revokes all previous Powers of Attorney issued on behalf of the Attorneys-In-Fact named above and expires on January 31, 2020.

This Power of Attorney is granted pursuant to Article IV of the By-Laws of United States Fire Insurance Company as now in full force and effect, and consistent with Article III thereof, which Articles provide, in pertinent part:

Article IV, Execution of Instruments - Except as the Board of Directors may authorize by resolution, the Chairman of the Board, President, any Vice-President, any Assistant Vice President, the Secretary, or any Assistant Secretary shall have power on behalf of the Corporation:

(a) to execute, affix the corporate seal manually or by facsimile to, acknowledge, verify and deliver any contracts, obligations, instruments and documents whatsoever in connection with its business including, without limiting the foregoing, any bonds, guarantees, undertakings, recognizances, powers of attorney or revocations of any powers of attorney, stipulations, policies of insurance, deeds, leases, mortgages, releases, satisfactions and agency agreements;

(b) to appoint, in writing, one or more persons for any or all of the purposes mentioned in the preceding paragraph (a), including affixing the seal of the Corporation.

Article III, Officers, Section 3.11, Facsimile Signatures. The signature of any officer authorized by the Corporation to sign any bonds, guarantees, undertakings, recognizances, stipulations, powers of attorney or revocations of any powers of attorney and policies of insurance issued by the Corporation may be printed, facsimile, lithographed or otherwise produced. In addition, if and as authorized by the Board of Directors, dividend warrants or checks, or other numerous instruments similar to one another in form, may be signed by the facsimile signature or signatures, lithographed or otherwise produced, of such officer or officers of the Corporation as from time to time may be authorized to sign such instruments on behalf of the Corporation. The Corporation may continue to use for the purposes herein stated the facsimile signature of any person or persons who shall have been such officer or officers of the Corporation, notwithstanding the fact that he may have ceased to be such at the time when such instruments shall be issued.

IN WITNESS WHEREOF, United States Fire Insurance Company has caused these presents to be signed and attested by its appropriate officer and its corporate seal hereunto affixed this 10th day of March, 2016.

UNITED STATES FIRE INSURANCE COMPANY

Anthony R. Slimowicz, Executive Vice President

State of New Jersey}
County of Morris }

On this 10th day of March 2016, before me, a Notary public of the State of New Jersey, came the above named officer of United States Fire Insurance Company, to me personally known to be the individual and officer described herein, and acknowledged that he executed the foregoing instrument and affixed the seal of United States Fire Insurance Company thereto by the authority of his office.

SONIA SCALA
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES 3/25/2019

Sonia Scala (Notary Public)

I, the undersigned officer of United States Fire Insurance Company, a Delaware corporation, do hereby certify that the original Power of Attorney of which the foregoing is a full, true and correct copy is still in force and effect and has not been revoked.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the corporate seal of United States Fire Insurance Company on the 07 day of March 2019

UNITED STATES FIRE INSURANCE COMPANY

Al Wright, Senior Vice President

AIA Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

Lang Constructors, Inc.

9145 Corunna Road

Flint, MI 48532

SURETY:
(Name, legal status and principal place of business)

United States Fire Insurance Company

305 Madison Avenue

Morristown, NJ 07962

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

OWNER:
(Name, legal status and address)

City of Flint

BOND AMOUNT: Five Percent of Bid (5% of Bid)

PROJECT: 2019 Phase VI Service Line Replacement (SLR)
(Name, location or address, and Project number, if any)

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, **or** within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (I) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 7th day of March , 2019

(Witness)

(Witness) Kris Andrick

Lang Constructors, Inc.
(Principal) *(Seal)*

(Title) Owner

United States Fire Insurance Company
(Surety) *(Seal)*

(Title) Dan Cusenza *, Attorney-In-Fact*

LANG
CONSTRUCTORS INC.

March 6, 2019

To: City of Flint
1101 S. Saginaw Street
Flint, MI 48502

Re: Phase 6
Proposed Construction Schedule

Lang Constructors, Inc. feels placing a time line and agreeing to liquidated damages with completion of **07/31/19** is difficult due to unknown number of exploratory that may be required to be replaced. Lang will replace an average of (4) each service lines a day per zone awarded, or (10) each exploratory per day per zone awarded.

Sincerely,

Jeffrey T. Lang
JTL/tsr

9145 Corunna Rd. Flint, MI 48532 * Phone 810-743-6702 * Fax 810-743-7090 * langconstructors@aol.com

LANG
CONSTRUCTORS INC.

March 6, 2019

To: City of Flint
1101 S. Saginaw Street
Flint, MI 48502

Re: Phase 6

Lang Constructors, Inc. bids up to (5) zones of 500 homes each.

Sincerely,

Jeffrey T. Lang
JTL/tsr

9145 Corunna Rd. Flint, MI 48532 * Phone 810-743-6702 * Fax 810-743-7090 * langconstructors@aol.com

LANG
CONSTRUCTORS INC.

March 6, 2019

To: City of Flint
1101 S. Saginaw Street
Flint, MI 48502

Re: Phase VI
Landfills

The landfill locations that Lang Constructors, Inc. will be using is the Brent Run Landfill facility and the Citizen Disposal located at;

Brent Run Landfill
8335 Vienna Road
Montrose, MI 48457

Citizen Disposal
2361 W. Grand Blanc Road
Grand Blanc, MI 48439

Sincerely,

Jeffrey T. Lang
JTL/tsr

9145 Corunna Rd. Flint, MI 48532 * Phone 810-743-6702 * Fax 810-743-7090 * langconstructors@aol.com

EXHIBIT G

OWNERSHIP STATEMENT

OWNER	-	City of Flint, Department of Purchase and Supplies
ENGINEER	-	TBD
PROJECT	-	Phase VI Service Line Replacement (SLR)

ARTICLE 1

1.1 If the Bidder is a corporation, partnership, limited partnership, limited liability corporation, limited liability partnership or a subchapter S corporation, the Bidder, in compliance with P.L. 1977, Chapter 33, shall submit, with the Bid, the following statement setting forth the names and addresses of all stockholders or individual partners who own ten percent (10%) or more of its stock or interest. If one or more such stockholder or partner is itself a corporation, partnership, limited partnership, limited liability corporation, limited liability partnership or a subchapter S corporation, the stockholders holding ten percent (10%) or more of that corporation's stock, or the individual partners owning ten percent (10%) or greater interest in that partnership, as the case may be, shall also be listed.

IF NONE, SO STATE

INDIVIDUAL	ADDRESS
Jeffrey T. Lang	8065 Sunset Drive Flint, MI 48532

NOTE: ADDITIONAL SHEETS CONSISTING OF 0 PAGES ARE ATTACHED.

END OF SECTION

C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

D. Recovery Schedule:

1. When periodic update indicates the Work is 14 or more calendar days behind the current accepted schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

2. If, at any time, the Work is behind schedule with respect to the progress schedule currently in force, and if the Engineer believes there is a risk of the Work not being completed within the Contract Time as a result of such delay, the Contractor shall take all necessary measures to make up for such delay either by increasing staff, equipment, or by amending its Work methods, whichever is applicable, with no change to the Contract Price.

E. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART):

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 CONTRACTOR'S LOOK-AHEAD SCHEDULES:

A. The Contractor shall provide short interval "look ahead" schedules bi-weekly, identifying Work that has been performed during the past two weeks and activities that are planned for the next four weeks. The short interval schedule shall be consistent with the progress schedule currently in force.

B. The Look-Ahead Schedules shall generally reflect the Work associated with the Detailed Progress Schedule. The activities in the Look-Ahead Schedules shall be identified by the same number coding as the Detailed Progress Schedule and revised as necessary.

C. The final format of the look-ahead schedules will be determined by the Engineer and Owner.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE:

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of accepted schedule to Engineer, ~~Owner,~~ separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. When revisions are made, distribute updated schedules to the same parties. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 32 33

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide construction photographs pertinent to the Contract work during the Contract period as specified.

1. Section includes administrative and procedural requirements for the following:

a. Preconstruction photographs.

b. Periodic construction photographs.

c. Final completion construction photographs.

1.2 SUBMITTALS:

A. Submit the following shop drawings in accordance with Section 01 33 00.

1. Pre-construction photographs documenting existing site conditions at each property where work will occur.

2. Photographs documenting new connections to the water distribution main and / or the new curb stop prior to backfilling at each property where a portion of the water service connection has been replaced.

3. Post-construction photographs documenting final site conditions at each property where work has occurred.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Digital Camera: Minimum sensor resolution of eight megapixels.

2. Format: Minimum 3200 x 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.

3. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project and Owner's project number.

b. Name of Engineer.

c. Name of Contractor.

d. Date and location (address) photograph was taken.

e. Description of vantage point, indicating location, direction (by compass point), and elevation of construction.

f. Unique sequential identifier keyed to accompanying key plan.

1.3 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Photographer to use techniques, material and equipment capable of producing photographs of high quality and resolution.

C. Photographer to be available on call on one day notice when requested by Engineer and be prepared to respond on shorter notice in unusual or unexpected conditions.

D. Dates for photography at site to be coordinated with Engineer and Engineer to be present during photographic periods at site unless approved otherwise by Engineer.

E. Photographer to make and retain detailed records of all photographs by photographer under this Contract:

1. The records to be in sufficient detail to support any attestation that may be required of photographer.

2. Photographer to retain such records for a period not less than three years from the final acceptance of entire work under this Contract.

1.4 DELIVERY STORAGE AND HANDLING:

A. Comply with the requirements specified in Section 01 66 10.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA:

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of eight megapixels, and at an image resolution of not less than 3200 x 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS:

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.

D. Pre-construction Photographs: Before starting construction, take photographs of Project site, including existing items to remain during construction, from different vantage points at each property.

1. Flag or otherwise identify excavation areas before taking photographs.

2. Take a minimum of two photographs to show existing conditions adjacent to property before starting the Work.

3. Take a minimum of two photographs of the exterior of existing buildings to accurately record physical conditions at start of construction.

4. Take a minimum of two photographs of the interior of existing buildings to accurately record physical conditions at start of construction.

5. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

E. Post-replacement Construction Photographs: Take a minimum of two photographs each, as applicable, of new service line connections to the water distribution main and of the service line connections at the new curb stop. Photographs shall be taken after all connections are fully complete and prior to backfilling at each property where a portion or all of the water service connection has been replaced.

F. Final Completion Construction Photographs: Take a minimum of two photographs each of the site, interior and exterior of the property upon completion of the work at each property.

3.2 ROUTE PHOTOGRAPHY REQUIRED:

A. Provide progressive photographs of equipment hauling routes before commencement of construction:

1. Progressive photographs of route starting at one end of route and progressing to other end then reverse progressive photography back to point of beginning.

2. Each exposure to overlap preceding exposure by 1/4 to 1/3 of the frame.

3. Additional photographs of features along route as directed by Engineer.

B. During Construction:

1. Bi-weekly to illustrate the condition of the route(s). Work photographed in previous sessions only photographed again sufficiently to provide progressive continuity of work unless otherwise directed by Engineer.

C. Upon Completion of All Construction Work:

1. Progressive photographs of route in same manner as that specified before commencement of Contract Work.

2. The route may be photographed in increments when work in that increment is completed and when approved by Engineer. Each increment photography to overlap other increment photography sufficiently such that all photographs provide progressive views of the route throughout.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals.

1. Shop Drawings.

2. Construction Photographs.

3. Contractor's Responsibilities.

4. Submission Requirements.

5. Review of Shop Drawings.

6. Distribution.

7. General Procedures for Submittals.

8. Certificate of Design.

9. Certificates of Compliance.

10. Schedules.

B. Additional general submission requirements are contained in Paragraph 6.17 of the General Conditions.

C. Detailed submittal requirements will be specified in the technical specifications section.

1.2 DEFINITIONS:

A. Written and graphic information that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Portable Document Format (.pdf): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 SUBMITTALS:

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with Contractor's construction schedule.

2. Format: Arrange the following information in a tabular format:

a. Scheduled date for first submittal.

b. Specification Section number and title.

c. Submittal category: Action; informational.

d. Description of the Work covered.

e. Scheduled date for Engineer's final release or acceptance.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS:

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

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

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on accepted submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. The Contractor shall revise and resubmit rejected submittals and those requiring corrections or verification of information in a timely manner such that the overall progress of the Work is not impeded.

5. Coordination of Submittal Times: The Contractor shall prepare and transmit each submittal sufficiently in advance of performing the related Work or other applicable activities, or within the time specified in the individual Sections of the Specifications, so that the installation will not be delayed by processing times, including rejection and resubmittal (if required), coordination with other submittals, purchasing, delivery, and similar sequenced activities. No extension of

Contract Time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

B. All shop drawings submitted by subcontractors for approval shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow 15 working days for review of each resubmittal.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.

2. Name file with submittal number or other unique identifier, including revision identifier.

a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Engineer, containing the following information, as applicable:

a. Project name.

b. Date.

c. Name and address of Engineer.

d. Name of Contractor.

e. Name of firm or entity that prepared submittal.

f. Names of subcontractor, manufacturer, and supplier.

g. Category and type of submittal.

h. Submittal purpose and description.

i. Specification Section number and title.

j. Specification paragraph number or drawing designation and generic name for each of multiple items.

k. Indication of full or partial submittal.

l. Transmittal number, numbered consecutively.

m. Submittal and transmittal distribution record.

n. Other necessary identification.

o. Remarks.

E. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.

2. Note date and content of revision in label or title block and clearly indicate extent of revision.

3. Resubmit submittals until they are marked with acceptance notation from Engineer's action stamp.

G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, and installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

H. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with acceptance notation from Engineer's action stamp.

1.5 CONSTRUCTION PHOTOGRAPHS:

A. The Contractor shall provide construction photographs in accordance with requirements specified in Section 01 32 33.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES:

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as .pdf electronic files.

a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.

B. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

C. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

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

E. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES:

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Engineer.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW:

A. Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents prior to submission to the Engineer. Mark with approval stamp before submitting to Engineer.

B. Contractor review shall verify the following:

1. Catalog numbers and similar data

2. Conformance with the Contract Documents

C. If a submittal shows any deviation from the requirements of the Contract Documents, the Contractor shall make specific mention of the deviations in the Transmittal Form furnished by the Engineer and provide a description of the deviations in a letter attached to the submittal.

D. The review and approval of submittals or product data by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will not have responsibility for any such errors and omissions.

E. No portion of the work requiring a submittal or product data shall be started nor shall any materials be installed prior to the approval or qualified approval of such item by the Engineer. Any materials purchased or on-site construction accomplished which does not conform to accepted submittals and data shall be at the Contractor's own risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity with the requirements of the Contract.

F. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION:

A. The Engineer's review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the Contract Documents or from departures therefrom. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for techniques of assembly, and for performing work in a safe manner.

B. Submittals will be reviewed for the Contractor's approval stamp. Submittals not stamped by the Contractor will be returned without any action.

C. The review of submittals and data will be general. They shall not be construed:

1. as permitting any departure from the Contract requirements;

2. as relieving the Contractor of responsibility for any errors or omissions, including details, dimensions, and materials;

3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.

D. If the submittals or data as submitted describe variations and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

E. Submittals will be returned to the Contractor under one of the action codes indicated below and defined on the transmittal form furnished by the Engineer.

1. Marking: No Exception Taken.

   a. When submittals are marked as "No Exception Taken," Work covered by submittal may proceed provided it complies with Contract Documents. Acceptance of Work depends on that compliance.

2. Marking: Make Corrections Noted.

   a. When submittals are marked as "Make Corrections Noted," Work covered by submittal may proceed provided it complies with Engineer's notations or corrections on submittal and with Contract Documents. Acceptance of Work depends on that compliance. Resubmittal not required.

3. Marking: Amend and Resubmit.

   a. When submittals are marked as "Amend and Resubmit," do not proceed with Work covered by submittal. Do not permit Work covered by submittals to be used at Project site or elsewhere where Work is in progress.

   b. Revise submittal or prepare new submittal in accordance with Engineer's notations in accordance with resubmittal requirements of this section. Resubmit without delay. Repeat if required to obtain different action marking.

4. Marking: Rejected; See Remarks.

   a. When submittals are marked as "Rejected; See Remarks," do not proceed with Work covered by submittal. Work covered by submittal does not comply with Contract Documents.

b. Prepare new submittal for different material or equipment supplier or different product line or material of same supplier complying with Contract Documents.

5. Marking: For Information Only.

a. When submittals are marked as "For Information Only," the Engineer will review the submittal but take no action.

b. It will be recorded as "For Information Only". Work covered by this submittal may proceed provided it complies with the Contract Documents.

6. Marking: Not Required for Review.

a. When submittals are marked as "Not Required for Review," the Engineer has not reviewed the submittal and it is being returned.

b. Work covered by this submittal may proceed provided it complies with the Contract Documents.

F. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any Work done in relation to revisions which are not specifically pointed out to the Engineer which are deemed, by the Engineer, not to be in accordance with the Contract Documents.

G. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor, and will be considered "Rejected" until resubmitted. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

H. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer. The submittal and the product data sheet reviews do not authorize changes in Contract Price or Contract Time. Changes involving Contract Price or Contract Time are authorized only by a signed Change Order, in accordance with the General Conditions.

I. When the submittals have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

J. Material and equipment delivered to the Site will not be paid for until the pertinent submittals have been reviewed and accepted by the Engineer.

3.3 CERTIFICATE OF DESIGN:

A. If specifically specified in other Sections of these Specifications, the Contractor shall submit the applicable Certificate of Design for each item required, Form 01 33 00-1, completely filled in and signed and sealed by a registered professional engineer.

3.4 CERTIFICATES OF COMPLIANCE:

A. Certificates of Compliance as specified in the specifications shall include and mean certificates, manufacturer's certificates, certifications, certified copies, and letters of certification and certificate of materials.

B. The Contractor shall be responsible for providing Certificates of Compliance as specified in the technical specifications. Certificates are required for demonstrating proof of compliance with specification requirements and shall be executed in six copies unless otherwise specified. Each certificate shall be signed by an official authorized to certify on behalf of the manufacturing company and shall contain the name and address of the Supplier, the project name and location, and the quantity and date or dates of shipment or delivery to which the certificates apply. Copies of laboratory test reports submitted with certificates shall contain the name and address of the testing laboratory and the date or dates of the tests to which the report applies. Certification shall not be construed as relieving the Supplier from furnishing satisfactory material, if after tests are performed on selected samples, the material is found not to meet the specific requirements.

3.5 SCHEDULES:

A. Provide all schedules specified in Articles 2.05B, 2.07, 14.01 and elsewhere in the General Conditions.

B. Article 14.02 of the General Conditions, Progress Payments, shall be subject to meeting the Schedule Requirements of Section 01 33 00, Table 01 33 00-1. No progress payment identified in Section 01 33 00, Table 01 33 00-1over the limits identified will be made until the milestones set in this table are satisfied.

Table 01 33 00-1

Section	Submittal	Payment Milestone
01 32 17	Project schedule is submitted and reaches no exceptions taken status.	Prior to 5% payment
01 33 00	Shop drawings are submitted and reach no exceptions taken status.	Prior to 25% payment.
01 77 00	Record documentation is submitted and reaches no exceptions taken status.	Prior to 95% payment.
01 77 00	Punch list is completed and corrected.	Prior to 95% payment.

END OF SECTION

Form 01 33 00-1

CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of Michigan and that he/she has been employed by (Name of Contractor) _____ to design

_____in accordance with Specifications Section for the (Name of Project) _____ The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the_____; that said design is in conformance with all applicable local, state, and federal codes, rules, and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance with limits of $1,000,000.00 and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the Town/City of _ or Owner's representative within seven (7) days following written request therefore by the Owner.

_____	_____
P.E. Name	Contractor's Name
_____	_____
Signature	Signature
_____	_____
Title	Title
_____	_____
Address	Address

SECTION 01 35 43

PROTECTION OF ENVIRONMENT

PART 1 - GENERAL

1.1 SUMMARY:

A. Contractor, in executing Work, shall maintain Work areas on- and off-site free from environmental pollution that would be in violation of federal, state or local regulations.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.

C. Any contamination shall be reported by the Contractor to the Owner, the Engineer and the Michigan Department of Environmental Quality (DEQ) and cleaned up as per DEQ requirements.

D. The Contractor shall be responsible for the protection of the natural environment of the Site and surrounding areas, both land and water. Protection of the environment must start with avoidance and prevention, and then control/mitigation, compensation, or enhancement (in order of descending preference).

E. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as sedimentation or filtration systems, hay bales, seeding, mulching, or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, storm sewers, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.

F. Ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

G. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.

H. Payment:

1. Consider Work specified in this section incidental and include payment as part of appropriate lump sum or unit prices specified in Bid Form.

1.2 REFERENCES:

A. United States Environmental Protection Agency (USEPA):

1. EPA-72-015: Guidelines for Erosion and Sedimentation Control Planning and Implementation

2. EPA 43019-73-007: Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity

B. Federal Environmental Protection Act and applicable regulations.

C. Michigan Department of Environmental Quality.

1.3 SUBMITTALS

A. Submit shop drawings in accordance with the requirements of Section 01 33 00 "Submittals".

B. Prior to commencing any Work on this Contract and not later than fifteen (15) Working Days following receipt of the Notice to Proceed, the Contractor shall submit Environmental Protection shop drawings for the Engineer's review and approval. Submit shop drawings for the following:

1. Plans and sketches showing areas proposed to be used for construction storage, the Contractor's Site office, vehicle cleaning, equipment fueling and associated access routes.

2. Surface drainage and storm sewer control plan.

3. Erosion and sediment control plan

4. Waterways control plan.

5. Tree protection plan.

6. Mud and dust control plan.

7. Noise control plan.

8. Fuels and lubricants storage and dispensing control plan.

9. Construction Equipment Cleaning control plan.

10. Spills response and spills reporting plan.

11. Excavation spoils disposal plan

12. Historical resources contingency plan.

13. Fuel spills contingency plan

1.4 PROTECTION OF STORM SEWERS:

A. Prevent construction material (including volatile liquid wastes such as oil, chemicals, and paints), pavement, concrete, earth or other debris from entering existing storm sewer or sewer structure.

1.5 PROTECTION OF WATERWAYS:

A. Observe rules and regulations of the State of Michigan and U.S. Federal agencies prohibiting pollution of lakes, streams, rivers or wetlands by dumping of refuse, rubbish, dredge material or debris.

1. Permits shall be obtained by Contractor at Contractor's cost.

B. The Contractor shall not cause or permit action to occur which would cause an overflow to existing waterways. Provide holding ponds or accepted method which will divert flows, including storm flows and flows created by construction activity, to prevent excessive silting of waterways or flooding damage to property.

C. Comply with procedures outlined in U.S. EPA manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning and Implementation", Manual EPA-72-015 and "Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity", Manual EPA 43019-73-007.

1.6 PROTECTION OF TREES:

A. No trees are to be cut down unless shown on the Contract Drawings or designated by the Engineer.

B. The Contractor shall take precautions to prevent damage to existing trees and shrubs, protect branches and foliage, protect trunks and stems, and prevent machinery from travelling over roots within the 'drip-line' of the trees by placing and maintaining snow fencing around each tree outside of the 'drip-line'. The Contractor shall not pile excavated material within the 'drip-line of existing trees.

C. Where damage does occur, it must be reported by the Contractor to the Engineer and repaired or replaced by a qualified person as directed by the Engineer. In the event of damage to bark, trunks, limbs, or roots of plants that are not designated for removal, the Contractor shall treat damage by corrective pruning, bark tracing, application of a heavy coating of tree paint, and other accepted horticultural and tree surgery practices.

1.7 DISPOSAL OF EXCESS EXCAVATED AND OTHER WASTE MATERIALS:

A. Excess excavated material not required or not suitable for backfill and other waste material shall be disposed of in accordance with local regulatory requirements. No spoils materials shall be stored on site or at a location without written approval from the designated storage location.

B. Provide watertight conveyance for liquid, semi-liquid or saturated solids which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal. Fluid materials hauled for disposal must be specifically acceptable at selected disposal site.

1.8 PROTECTION OF AIR QUALITY:

A. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use.

B. Do not burn trash on or adjacent to construction site.

C. If temporary heating devices are necessary for protection of Work, they shall not cause air pollution.

D. The Contractor shall conduct operations of dumping rock and of carrying rock away in trucks in such a way as to minimize dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water them to prevent dust. Strictly adhere to all applicable environmental regulations for dust prevention.

1.9 THAWING OF FROZEN GROUND:

A. Contractor is not authorized to utilize fires as a means to thaw frozen ground.

1.10 USE OF CHEMICALS:

A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall be approved by U.S. EPA or U.S. Department of Agriculture and any other applicable regulatory agency.

B. Use and disposal of chemicals and residues shall comply with manufacturer's instructions.

1.11 NOISE CONTROL:

A. Conduct operations to cause least annoyance to residents in vicinity of Work, and comply with applicable local ordinances.

B. Equip compressors, hoists, and other apparatus with mechanical devices necessary to minimize noise and dust. Equip compressors with silencers on intake lines.

C. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.

D. Line storage bins and hoppers with material that will deaden sounds.

E. Conduct operation of dumping rock and of carrying rock away in trucks so as to cause minimum of noise and dust.

F. Route vehicles carrying rock, concrete or other material over such streets as will cause least annoyance to public and do not operate on public streets between hours of 5:00 PM and 7:00 AM, or on Saturdays, Sundays or legal holidays unless accepted by Engineer.

G. No excessive idling of motorized equipment is permitted.

H. Where necessary, the Contractor shall place noise attenuation devices (barriers) around the Contractor's construction equipment.

I. Submit a plan to mitigate construction noise and to comply with noise control ordinances, including methods of construction, equipment to be used, and acoustical treatments.

1.12 MUD AND DUST CONTROL:

A. Due to close geographic location of Project to residential homes, take special care in providing and maintaining temporary site roadways, Owner's existing roads, and public roads used during construction operations in clean, dust free condition.

B. Comply with local environmental regulations for dust control. If Contractor's dust control measures are considered inadequate by Engineer, Engineer may require Contractor to take additional dust control measures.

C. The Contractor shall employ only wet type equipment for saw cutting and concrete grinding to control dust nuisance. There shall be no cutting prior to the Engineer's and Owner's approval.

D. The Contractor shall obtain the Engineer's acceptance before chemicals for dust control are used. Sodium chloride is not permitted for dust control.

E. All trenches and disturbed areas created during the execution of the Work that will produce dust shall be maintained dust free by an application of calcium chloride at the Engineer's direction.

F. The Contractor shall not use calcium chloride on access roads.

G. The Contractor shall transport dusty materials in covered haulage vehicles.

H. The Contractor shall be responsible for a prompt and complete cleanup of all dirt and mud deposited on the public and/or private property as a consequence of the execution of the Work. In the event that the Contractor fails to comply with this obligation the Owner may proceed with the necessary clean up and charge all the costs for the cleanup to the Contractor.

I. The Contractor shall wash mud from construction vehicles before leaving the construction Site.

J. The Contractor shall wash and clean the following roads at the end of each work day during the Contract:

1. Major traffic routes and City streets impacted by construction activities.

1.13 CLEANING OF EQUIPMENT

A. The Contractor shall keep construction equipment clean so that no debris is deposited on any public roadway. The Contractor shall identify a designated vehicle cleaning area within the working limits of the Contract. The Contractor shall contain all construction debris in this designated area only. The Contractor shall dispose of debris off Site at an approved facility.

B. The Contractor shall ensure that debris cleaned from equipment cannot gain access to storm sewers and watercourses.

1.14 FUELS AND LUBRICANTS:

A. Comply with local, state and federal regulations concerning transportation and storage of fuels and lubricants.

B. The Contractor shall designate an area within the working limits to be used exclusively for fueling of construction equipment. The Contractor shall carry out all refueling in this area only. Refueling of backhoes or shovels will be allowed at locations other than the accepted refueling areas, but not closer than 30 feet from any watercourse or storm sewer inlet.

C. Fuel storage area and fuel equipment shall be approved by Owner prior to installation. Submit containment provisions to Engineer for approval.

D. The Contractor shall submit to the Engineer for review prior to starting the Work, procedures for the interception and rapid clean-up and disposal of fuel spillages which may occur. The Contractor shall ensure that the materials required for the clean-up of fuel spillages are readily accessible on Site at all times.

E. The cleaning of equipment in streams and lakes and the emptying of fuel, lubricants and pesticides into watercourses or storm sewers is prohibited. The Contractor shall contain fuel, lubricants, pesticides and construction debris and dispose of it off Site in approved locations.

F. Report spills or leaks from fueling equipment or construction equipment to Engineer and cleanup as required by local, state or federal regulations.

G. Owner may require Contractor to remove damaged or leaking equipment from Project site.

1.15 CONTINGENCY AND EMERGENCY RESPONSE PLANS:

A. General

1. The Contractor shall adopt a pollution preventative strategy to fulfill its commitment to protecting public and worker health and safety, and the environment. Through this strategy, the potential issues and emergency events that can be anticipated shall be identified by the Contractor and procedures put in place by the Contractor to minimize their potential occurrence.

2. To address any unanticipated events, the Contractor shall develop Contingency and Emergency Response Plans and implement these plans during the performance of the Work.

B. Spills Response and Spills Reporting:

1. Prior to commencing construction, the Contractor shall be responsible for preparing a Spills Response Plan. The Spills Response Plan must address the response, containment, and cleanup of an accidental spill. It must take care of the specific roles and responsibilities of construction staff, accountability, reporting and documentation. Specifically, the plan must include:

   a. the names and the telephone numbers of the persons in the local municipalities to be notified forthwith of a spill

   b. the names and the telephone numbers of the representatives of the fire, the police and the health departments of the local municipalities who are responsible to respond to emergency situations

   c. the names and the telephone numbers of the companies experienced in the control and clean-up of hazardous materials that would be called upon in an emergency involving a spill

   d. the Contractor's proposal for the immediate containment and control of the spill, the clean-up procedures to be initiated immediately and any other action to be taken to mitigate the potential environmental damage while awaiting additional assistance, and,

   e. the name and the telephone number of the Contractor's representative responsible for preparing, implementing, directing and supervising the contingency plan

2. The Contractor shall submit for the Engineer's review, a copy of the Spills Response plan and shall make the appropriate changes to it based upon the comments received.

3. In the event of a spill or other emission of a pollutant caused by the execution of the Work into the natural environment, the Contractor shall immediately notify the

following of the spill, of the circumstances thereof, and of the action taken or intended to be taken with respect thereto:

a. The Michigan Department of Environmental Quality

b. The Owner

c. The owner of the pollutant, if known,

d. The person having control of the pollutant, if known,

e. The Engineer

4. The Contractor shall make the necessary allowances to ensure the immediate availability of the products with which to effect temporary repair to broken pipelines and other services so the spill or other emission of a pollutant is immediately controlled and stopped and to mitigate the damages. The Contractor shall do everything practicable to restore the natural environment.

5. The Contractor shall prepare a written report of the spill, and the spill event is to be recorded in the Contractor's log book. The report must contain the following information, at a minimum:

a. Date and time spill occurred.

b. Estimated volume of spill.

c. Duration of the spill.

d. Cause and discovery of the spill.

e. Cleanup and recovery measures taken.

f. Name of hauler or outside contractors called in to assist with cleanup and recovery measures.

g. Personnel on the scene.

h. Names of parties and agencies notified and the date and time of notification of each.

i. Steps to be taken to prevent a reoccurrence of the spill.

C. Fire Contingency Plan

1. The Contractor shall develop and submit a Fire Contingency Plan to ensure a rapid response to a fire thereby minimizing the threat to worker and public safety, and the environment.

2. The plan must include, but is not limited to an explanation of the purpose of the plan and when the plan is triggered, an explanation of relevant roles and responsibilities, and accountability for implementing the plan, and provision of fire prevention training and equipment for implementing the plan.

1.16 NOTIFICATIONS:

A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.17 IMPLEMENTATION:

A. Prior to commencement of the work, meet with the Engineer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.

B. Remove temporary environmental control features, when accepted by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

C. Implementation of the Contingency and Emergency Response Plans

1. The responsibility for implementing the Contingency and Emergency Response Plans shall lie with the Contractor. Specific responsibilities include:

a. Reviewing the Contingency Plans and Emergency Response Plans and identifying any issues / concerns and providing suggested changes / updates;

b. Ensuring that all construction staff are trained in Contingency Plan Implementation and Emergency Response Techniques and that they have the appropriate equipment on hand;

c. Providing advice to construction staff on proper emergency response procedures;

d. Auditing the Contractor's response to events resulting in the activation of its Contingency Plans and Emergency Response Plans;

e. Initiating actions to correct any response deficiencies identified through the audit process and reporting it;

f. Maintaining emergency response records for review by the Engineer and the appropriate regulatory agencies.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 42 13

DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

B. General: Basic Contract definitions are included in the General Conditions.

C. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.

D. "Directed": A command or instruction by Engineer. Other terms including "requested," "ordered," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

G. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

H. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

I. "Provide": Furnish and install, complete and ready for the intended use.

J. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

K. "Elevation": The figures given on the Drawings or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the datum adopted by the Engineer.

L. "Rock": The word "rock," wherever used as the name of an excavated material or material to be excavated, shall mean only boulders and pieces of concrete or masonry exceeding 1 cubic yard in volume, or solid ledge rock which, in the opinion of the Engineer, requires, for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock which can be removed with a hand pick or power-operated excavator or shovel, no loose, shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed as "rock."

M. "Earth": The word "earth", wherever used as the name of an excavated material or material to be excavated, shall mean all kinds of material other than rock as above defined.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 43 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section covers Quality Assurance and Quality Control requirements for this contract.

B. The Contractor is responsible for controlling the quality of work, including work of its subcontractors, and suppliers and for assuring the quality specified in the Technical Specifications is achieved.

C. Refer to the General Conditions Article 6 - Contractor's Responsibilities.

1.2 SUMMARY:

A. Section includes administrative and procedural requirements for quality assurance and quality control.

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

1. Specific quality-assurance and quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.

2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.

3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Requirements:

1.3 REFERENCES:

A. American Society for Testing and Materials (ASTM):

1. E329: Standard Specification for Agencies Engaged in Construction Inspection and/or Testing

1.4 DEFINITIONS:

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Engineer.

C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

D. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

E. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

F. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

G. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

H. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.5 CONFLICTING REQUIREMENTS:

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum

within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.6 SUBMITTALS:

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN:

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Engineer. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

C. Monitoring and Documentation: Maintain testing and inspection reports including log of accepted and rejected results. Include work Engineer has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS:

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections.

B. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.9 QUALITY ASSURANCE:

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.

D. Codes and Standards: Refer to General Conditions Article 3 - Contract Documents: Intent, Amending, Reuse of the General Conditions.

E. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the Contractor for superintendence and quality control of the work, the Contractor shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the Contractor's personnel, subcontractors, and Engineer.

F. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. The Contractor shall not use material and equipment for any purpose other than that intended or specified unless the Engineer authorizes such use.

G. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the referenced standard.

1.10 MATERIALS AND EQUIPMENT:

A. The Contractor shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.

B. The Contractor shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer's printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless accepted otherwise by the Engineer.

1.11 QUALITY CONTROL:

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

3. Comply with manufacturers' instructions, including each step in sequence.

4. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

5. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

6. Perform Work by persons qualified to produce required and specified quality.

7. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

8. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

9. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

10. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

11. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

C. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 QUALITY CONTROL:

A. Quality control is the responsibility of the Contractor, and the Contractor shall maintain control over construction and installation processes to assure compliance with specified requirements.

B. Certifications for personnel, procedures, and equipment associated with special processes shall be maintained by the Contractor, available for inspection by the Engineer. Copies shall be made available to the Engineer upon request.

C. Means and methods of construction and installation processes are the responsibility of the Contractor, and at no time is it the intent of the Engineer to supersede or void that responsibility.

3.2 REPAIR AND PROTECTION:

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 SCOPE OF WORK:

A. The Contractor shall provide all temporary facilities for the proper completion of the work, as required and as specified.

1.2 USE CHARGES:

A. General: Costs for installation, removal and use of temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Engineer and subcontractors, Owner, testing agencies, and authorities having jurisdiction.

B. Sanitary Service:

1. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required by pertinent health and safety regulations.

2. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

a. The Contractor shall not use the Owner's sanitary facilities.

C. Water Service from Existing System:

1. Contractor shall coordinate with, and receive written approval from the Owner or owner of the existing water distribution system before utilizing any private or public water sources.

2. Contractor is required to complete all permitting and pay all fees associated with the use of water from public or private sources.

3. Upon approval, the owner of the water system shall provide reasonable quantities of water at the then existing pressure from a mutually convenient hydrant of the water distribution system. The Contractor shall furnish all necessary pipe or hose extensions to conduct the water to the points of use and shall exercise due care not

to waste water. The Contractor shall not contaminate the water supply and shall comply with all applicable regulations and code requirements.

4. The Owner reserves the right to limit, suspend, or terminate the supply of water as set forth above should it consider such action to be necessary on account of damage to the distribution system, the necessity of conserving water, or other emergency. In this event, the Contractor shall obtain water from some other approved source, at his own expense.

1.3 TRAFFIC REGULATION:

A. Signs, Signals, And Devices:

1. Post mounted traffic control and informational signs as necessary to direct traffic around construction areas.

2. Maintain traffic cones, drums, and other static barricades as necessary to direct traffic around construction areas.

3. Flag person Equipment: As required by local jurisdictions.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares and Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Haul Routes:

1. Confine construction traffic to designated haul routes.

2. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.

E. Traffic Signs and Signals:

1. Provide signs approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

2. Provide, operate, and maintain traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.

3. Relocate as Work progresses, to maintain effective traffic control.

F. Removal:

1. Remove equipment and devices when no longer required.

2. Repair damage caused by installation.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES:

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. The Contractor may maintain a temporary field office near the work for his own use during the period of construction at which readily accessible copies of all contract documents shall be kept. The office shall be located where it will not interfere with the progress of the work. In charge of this office there shall be a competent superintendent of the Contractor as specified under "Supervision of Work" in the AGREEMENT.

C. Temporary Storage Yards: The Contractor shall construct temporary storage yards for storage of Products that are not subject to damage by weather conditions. Contractor shall not use any areas, including local streets, parking lots, or abandoned properties for storage without receiving written authorization and consent from the City or property owner. Contractor is responsible for completing all applications, associated administrative tasks, and payment of all fees, including permits and insurance, required to obtain access and utilize the storage area.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL:

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION:

A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

B. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

C. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

D. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

3.3 SUPPORT FACILITIES INSTALLATION:

A. Permanent Roads and Paved Areas: Maintain roads and paved areas adequate for construction operations and local vehicular traffic.

1. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust. Do not use chemical means of dust control without prior written approval from the Engineer. The use of petroleum products will not be allowed at any time.

2. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course as specified.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.

2. Maintain access for fire-fighting equipment and access to fire hydrants.

3. Unless described and approved under a Traffic Control Plan (TCP), conduct operations on the site so that the use of any roads by vehicles employed under this Contract will not restrict pedestrian and vehicular traffic thereon nor hinder the use of such facilities.

4. All roads within the work area may be used simultaneously by vehicles and pedestrians. The speed limit of 15 mph applies throughout the work areas, including the access roads and parking lots. Failure to comply with speed limit or to operate vehicles safely will result in possible removal of the staff from the plant.

C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.

2. Remove snow and ice as required to minimize accumulations.

D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION:

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to local properties.

D. Storm water Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.

E. Tree and Plant Protection: Protect trees and vegetation from damage during construction operations. Protect tree root systems from damage, flooding, and erosion.

F. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

3.5 OPERATION, TERMINATION, AND REMOVAL:

A. Maintenance: Maintain facilities in good operating condition until removal.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION

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SECTION 01 57 13

EROSION CONTROL, SEDIMENTATION AND CONTAINMENT OF CONSTRUCTION MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide all work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area as to prevent damage to any stream or wetlands.

1.2 REFERENCES:

A. United Stated Environmental Protection Agency (USEPA):

1. Guidelines for Erosion and Sediment Control, Planning and Implementation.

2. Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity.

1.3 SUBMITTALS:

A. Provide submittals in accordance with Section 01 33 00.

B. Two weeks prior to the start of the work, submit to Engineer, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

1.4 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Use acceptable procedures, including use of sediment barriers and inlet sediment traps.

C. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.

D. Engineer has authority to limit surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and fill operations and to direct immediate permanent or temporary pollution control measures to prevent contamination of any stream or wetlands, including construction of temporary berms, dikes, dams, sediment basins, sediment traps, slope drains, and use of temporary mulches, mats, or other control devices or methods to control erosion.

PART 2 - PRODUCTS

2.1 BALES:

A. Hay or straw or other suitable material acceptable to Engineer.

PART 3 - EXECUTION

3.1 GENERAL:

A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water, storm sewers, or into natural or man-made channels.

B. Design erosion and sediment controls to handle peak runoff resulting from storm events.

C. The Contractor shall be responsible for inspecting and maintaining these control measures to ensure their proper function and adequate sediment storage at all times. The Contractor shall remove sediment once it reaches 50 percent of the capacity of the structure. Sediment collected shall be disposed of offsite at the Contractor's cost.

3.2 INSTALLATION:

A. Install baled hay or straw erosion checks in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.

B. Construct diversions to intercept and divert runoff water from critical areas.

C. Discharge silt-laden water from excavations onto filter fabric mat and/or baled hay or straw sediment traps to ensure that only sediment-free water is returned to watercourses.

D. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.

E. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.

F. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, storm sewers, or natural or man-made channels leading thereto.

G. Prevent damage to vegetation adjacent to or outside of construction area limits.

H. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, wash water from concrete trucks or hydro seeders, or any other pollutant in streams, wet-lands, surface waters, storm sewers, or natural or man-made channels leading thereto, or unspecified locations.

I. Do not alter flow line of any stream unless indicated or specified.

END OF SECTION

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SECTION 01 61 00

CONTROL OF MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION:

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

1.2 DEFINITIONS:

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and accepted through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.3 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.4 DELIVERY STORAGE AND HANDLING:

A. Contractor shall arrange deliveries of materials and equipment in accordance with construction Progress Schedule, coordinate to avoid conflict with Work and conditions at site.

B. Comply with the requirements of Section 01 66 10.

C. Provide equipment and personnel to handle materials and equipment by methods recommended by manufacturer to prevent soiling or damage to materials or equipment, or their packaging.

D. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

E. Owner assumes no responsibility for damage or loss due to storage of materials and equipment.

F. Interior Storage:

1. Store with seals and labels intact and legible.

2. Store materials and equipment subject to damage by elements in weather tight enclosures.

3. Maintain temperature and humidity within ranges required by manufacturer's instructions.

G. Exterior Storage:

1. Store fabricated materials and equipment above ground, on blocking or skids, to prevent soiling or staining. Cover materials and equipment subject to deterioration with impervious sheet coverings. Provide ventilation to avoid condensation.

2. Store loose granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.

3. Store materials such as pipe, reinforcing steel, structural steel, and equipment on pallets or racks, off ground.

H. Inspection and Maintenance:

1. Arrange storage to provide easy access for inspection, maintenance, and inventory.

2. Make periodic inspections of stored materials and equipment to ensure materials and equipment maintained under specified conditions are free from damage or deterioration, and coverings are in-place and in condition to provide required protection.

I. Contractor shall assume responsibility for protection of completed construction and repair and restore damage to completed Work equal to original condition.

1.5 WARRANTY:

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and

limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

1.6 PRODUCTS:

A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.

1.7 ACCEPTANCE OF MATERIALS:

A. Unless otherwise specified, only new materials shall be incorporated in the work. All materials furnished by the Contractor shall be subject to the inspection and acceptance of the Engineer. No material shall be delivered to the work without prior acceptance of the Engineer.

B. As specified in Section 01 33 00, the Contractor shall submit to the Engineer data relating to materials he proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications.

C. Any delay of acceptance resulting from the Contractor's failure to submit data promptly shall not be used as a basis of a claim against the Owner or the Engineer.

D. The materials used on the work shall correspond to the accepted submittals.

1.8 REUSE OF EXISTING MATERIAL:

A. Except as specifically indicated or specified, do not reuse existing materials in new Work.

1.9 MANUFACTURER'S INSTRUCTIONS:

A. Installation of equipment and materials shall comply with manufacturer's instructions.

B. Handle, store, install, connect, and adjust materials in accordance with manufacturer's written instructions and in conformance with Specifications.

1. If Site conditions or specified requirements conflict with manufacturer's instructions, consult Engineer for further instructions. Do not proceed with Work without written instructions.

1.10 GENERAL MATERIAL AND EQUIPMENT REQUIREMENTS:

A. The requirements of this Paragraph shall constitute the standards for the material and equipment specified herein. Should these requirements conflict with the Supplier's

recommendations or in any way be less stringent than the Supplier's requirements, they shall be superseded by the Supplier's requirements.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

A. Material and Equipment Incorporated into Work:

1. Conform to applicable specifications and standards.

2. Comply with size, make, type, and quality specified or as accepted by Submittal.

B. Do not use material or equipment for purpose other than for which it is designed or specified.

PART 3 - EXECUTION

3.1 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

SECTION 01 66 10

DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.1 GENERAL:

A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

1.2 TRANSPORTATION AND DELIVERY:

A. Transport and handle items in accordance with manufacturer's printed instructions.

B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment or materials be delivered to the site more than one month prior to installation without written authorization from the Engineer.

C. Carefully pack and crate equipment and materials for shipment.

D. Identify each component with durable identifying labels or tags securely attached to each piece of equipment, crate or container.

E. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.

F. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.

G. Assume responsibility for equipment material and spare parts just before unloading from carrier at site.

H. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

I. Provide equipment and personnel to unload all items delivered to the site.

J. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by Owner, perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

K. Pay all demurrage charges if failed to promptly unload items.

1.3 STORAGE AND PROTECTION:

A. Store and protect products and equipment in accordance with the manufacturer's instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer. Instructions shall be carefully followed and a written record of this kept by the Contractor for each product.

B. Arrange storage of products and equipment to permit access for inspection. Periodically inspect to make sure products and equipment are undamaged and are maintained under specified conditions.

C. Provide protective maintenance during storage consisting of manually exercising equipment, inspecting mechanical surfaces for signs or corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer necessary for its protection and all other precautions to assure proper protection of all materials and equipment stored and for compliance with manufacturers' requirements related to warranties.

D. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.

E. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

(Not Used)

END OF SECTION

SECTION 01 74 23

CLEANING UP

PART 1 - GENERAL

1.1 SUMMARY:

A. Execute cleaning during progress of Work and at completion of Work.

B. Refer to specification sections for specific cleaning for Products or Work.

1.2 DISPOSAL REQUIREMENTS:

A. Conduct cleaning and disposal operations to comply with local codes, ordinances, regulations, and anti-pollution laws. Do not burn or bury rubbish or waste materials on Project site. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains. Do not dispose of wastes into streams or waterways.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 CLEANING DURING CONSTRUCTION:

A. During execution of work, clean site, adjacent properties, and public access roads and dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish. Unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.

B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.

C. Cover or wet excavated material leaving and arriving at the site to prevent blowing dust. Clean the public access roads to the site of any material falling from the haul trucks.

D. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.

E. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

F. Provide on-site containers for collection and removal of waste materials, debris, and rubbish in accordance with applicable regulations.

3.2 FINAL CLEANING:

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.

b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.

c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.

e. Leave Project area clean and ready for occupancy.

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY:

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.

2. Final completion procedures.

3. Final cleaning.

4. Repair of the Work.

1.3 SUBSTANTIAL COMPLETION PROCEDURES:

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

2. Submit closeout submittals specified in Contract Documents, including project record documents, final completion construction photographic documentation, damage or settlement surveys, and similar final record information.

3. Submit closeout submittals specified in Contract Document Sections, including specific warranties, workmanship bonds, and similar documents.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Terminate and remove temporary facilities from Project site, along with construction tools, equipment and materials.

2. Complete final cleaning and restoration requirements.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items that must be completed or corrected before certificate will be issued.

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

2. Results of completed inspection will form the basis of requirements for final completion.

1.4 PROJECT RECORDS DOCUMENTS

A. The Contractor shall record any actual revisions to the Work and maintain one set of the following Project Record Documents on Site:

1. Contract Drawings, Specifications, and Addenda.

2. Change Orders, Field Orders, and other written notices.

3. Shop drawings, Product data, and samples.

4. Project Record Drawings.

B. The Contractor shall record information on the Project Record Documents concurrent with construction progress and store these documents separately from the documents used for construction.

1. The Owner will supply a set of Contract Drawings. The Contractor shall mark thereon all revisions as the Work progresses in order to produce a set of as-built drawings.

2. The Contractor shall note any changes made during construction by any of the Contractor's forces or those of any Subcontractors.

3. The Contractor shall dimension the locations of buried or concealed Work, especially piping, valves and fittings, with reference to exposed structures.

4. Certificates of Substantial Completion shall not be issued until as-built drawings are complete and submitted.

5. Measured locations of internal utilities and appurtenances which are concealed in construction, referenced to visible and accessible features of the Work.

6. Changes in the Work caused by Site conditions, or originated by the Owner, the Engineer, the Contractor, or Subcontractors and by addenda, supplemental drawings, Site instructions, supplementary instructions, change orders, correspondence, and directions of any regulatory authorities.

1.5 FINAL COMPLETION PROCEDURES:

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

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

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST):

A. Engineer will provide a punch list of outstanding work items to be addressed by Contractor prior to final payment and issuance of a Notice of Substantial Completion. The punch list will identify each area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 REPAIR OF THE WORK:

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction, including replacement of defective materials. Restore areas damaged during construction.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide site clearing as indicated and in compliance with Contract Documents.

B. Section Includes:

1. Clearing and grubbing.

2. Tree and shrub protection and removal.

3. Removal of debris related to clearing operations.

1.2 DEFINITIONS:

A. Caliper: Instrument used to measure tree diameter.

B. Clearing: Removal and disposal of above-ground items defined herein.

C. Grubbing: Removal and disposal of below-ground items defined herein.

1.3 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Permits:

1. Obtain Land Disturbance Permit from an accepted Erosion and Sediment Control Plan. See General Conditions for additional requirements. Submit copy of permit to Engineer.

C. All tree pruning, tree repair, and tree removal shall be performed by competent workers.

1.4 DELIVERY STORAGE AND HANDLING:

A. Comply with the requirements specified in Section 01 66 10.

PART 2 - PRODUCTS

2.1 ACCESSORIES:

A. Tree Wound Paint: Bituminous based paint formulated for tree wounds.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify temporary erosion and sediment control measures are installed before commencing with any other work at the site.

B. Verify location and existence of all underground utilities and structures by contacting utility owners. Go to "Call Before You Dig" to receive state-specific information. Access this information by dialing 811 or going to http://call811.com/state-specific.aspx.

C. Provide 72-hour notice to existing utility owners, prior to beginning construction.

D. Contact utility companies and authorities to make arrangements for handling and disposal of utilities encountered during construction.

3.2 PREPARATION:

A. Protect trees and vegetation. Do not cut or injure trees and vegetation outside of immediate work area.

B. Protect all underground utilities and structures. If damage occurs, immediately notify the utility owner immediately.

C. Protect site features to remain from damage by construction equipment and vehicular traffic.

D. Identify waste disposal area(s) for disposal of removed materials. Contractor should provide written authorization form disposal site(s) acknowledging the use of the facility to dispose of removed materials.

3.3 RESTORATION:

A. Existing surfaces, features, utilities, or structures that are to remain but are damaged during construction shall be restored to at least the condition in which they were found immediately before work began, unless noted otherwise.

B. Restore damaged utilities to the satisfaction of the utility owner.

C. Restore damaged private property to the satisfaction of the property owner.

3.4 CLEARING:

A. Remove and dispose of off site:

1. Trees, snags, brush, shrubs, downed timber, decayed wood, and other vegetative growth.

2. Rocks, tiles, lumps of concrete, trash piles, debris, refuse and rubbish. Remove all evidence of their presence from the work area.

B. Clear ground within limits of work, unless otherwise noted.

C. Manual cutting of trees, stumps, and stubs during clearing shall be as close to ground surface as practicable but no higher than 6 inches above ground for small trees (8 inches or less), and not higher than 12 inches above ground for larger trees (greater than 8 inches).

D. Obey all federal, state and local regulations and guidance regarding the cutting and disposal of diseased trees and vegetation.

3.5 GRUBBING:

A. Remove and dispose of all stumps, buried logs, matted roots, roots larger than 2 inches and organic materials off site at an approved facility.

B. Roots larger than 2 inches in diameter shall be removed to a depth of 12 inches and roots larger than 1/2-inches in diameter to a depth of 6 inches.

C. Areas designated to receive pavement or structures shall be grubbed a depth of 18 inches. Measure depths of cut from existing ground surface or proposed finished grade, whichever is lower.

D. Depressions made by grubbing shall be filled with suitable material and compacted to conform to original adjacent grade.

E. Do not grub areas within drip line of trees to remain to avoid damage to roots.

3.6 TREE AND SHRUB REMOVAL:

A. Remove trees and shrubs within work area by felling or cutting individual vegetation and grubbing only as directed by Engineer and authorized by property owner.

B. Remove root and stump as described under Paragraph 3.05 above.

3.7 PRUNING:

A. Trim dead branches 1-1/2-inches or more in diameter and branches to heights and in a manner as indicated. Neatly cut limbs and branches close to the bole of the tree or main branches. Paint cuts more than 1-1/4-inches in diameter tree wound paint.

3.8 BURNING:

A. Burning is not permitted on site.

3.9 CLEANING:

A. Promptly dispose of excess and unsuitable material off site at an approved facility.

B. Remove debris, junk, and trash from site.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris before entering public or private property, adjacent to site.

3.10 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 70 00.

END OF SECTION

SECTION 31 23 19

DEWATERING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide dewatering as indicated and in compliance with Contract Documents.

B. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:

1. Lower the groundwater level.

2. Lower hydrostatic pressure.

3. Prevent surface water from entering the excavation during construction.

4. Implement erosion control measures for disposing of discharge water.

C. Groundwater within the excavation area shall be lowered to at least 2 feet below the lowest excavation levels as specified and as indicated.

D. Common dewatering methods include, but are not limited to, sump pumping, deep wells, well points, vacuum well points or combinations thereof.

E. The Contractor shall obtain the required permits for discharge from the Contractor's dewatering systems in accordance with 40 CFR Part 122. The discharge location shall be in accordance with permit requirements.

1.2 REFERENCES:

A. Code of Federal Regulations, Title 40 – Protection of Environment (CFR):

1. 40 CFR Part 122: EPA Administered Permit Programs: The National Pollutant Discharge Elimination System.

1.3 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00.

1. Qualification of the Contractor's dewatering specialist's or firm's qualifications a minimum of 4 weeks prior to dewatering work. The submittal shall include, but not be limited to:

a. Qualifications of specialist's or firm's Registered Professional Engineer.

b. Qualifications of specialist's or firm's field representative who will oversee the installation, operation and maintenance of the dewatering system.

2. Submit a dewatering plan at least 2 weeks prior to start of dewatering work. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:

a. Dewatering plan and details stamped and signed by a Registered Professional Engineer registered in the state where the project resides.

b. Certificate of Design: Refer to Section 01 33 00.

c. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.

d. Detailed description of dewatering, maintenance, and system removal procedures.

e. Erosion and sedimentation control measures, and methods for disposal of pumped water.

f. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.

g. List of assumptions mode for design of dewatering systems, including but not limited to groundwater levels, soil profile, permeabilities, and duration of pumping.

3. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines or softening of the ground.

1.4 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Employ the services of a dewatering specialist or firm having the following qualifications:

1. Have completed at least 5 successful dewatering projects of equal size and complexity and with equal systems within the last 5 years.

C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified.

D. Notify the Engineer immediately if settlement or movement is detected on structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within 24 hours. Implement the modified plan and repair damage incurred to adjacent structures.

E. Immediately notify the Engineer if oil or other hazardous materials are encountered after dewatering begins.

1.5 DELIVERY STORAGE AND HANDLING:

A. Comply with the requirements specified in Section 01 66 10.

1.6 SITE CONDITIONS:

A. Subsurface Conditions: Refer to Division 00.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.

B. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.

C. Provide auxiliary dewatering equipment in the event of breakdown. Equipment shall consist of pumps and hoses and be stored on site. Provide at least 1 pump for every 5 pumps used.

D. Provide and maintain erosion and sedimentation control devices as indicated or specified and in accordance with the dewatering plan.

E. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.

F. Provide cement grout having a water cement ratio of 1 to 1 by volume.

3.1 INSTALLATION:

A. Execution of earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all

Engineer's comments satisfactorily addressed and the geotechnical instrumentation has been installed.

B. Provide and maintain dewatering system in accordance with the dewatering plan.

C. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.

D. Do not excavate until the dewatering system is operational.

E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.

F. Discontinue open pumping from sumps and ditches when such pumping results in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan and submit revised plan to the Engineer for acceptance.

G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 31 23 33.

H. Dewatering Discharge:

1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.

2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.

3. Provide separately controllable pumping lines.

4. The Engineer reserves the right to sample discharge water at any time.

5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.

I. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.

J. Removal:

1. Do not remove dewatering system without written acceptance from the Engineer.

2. Backfill and compact sumps or ditches with screened gravel or crushed stone wrapped with geotextile fabric in accordance with Section 31 23 33.

3. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

3.2 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

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SECTION 31 23 33

TRENCHING AND BACKFILL

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide trenching and backfill as indicated and in compliance with Contract Documents.

B. Section includes:

1. Trench excavation width and safety.

2. Backfill materials and placement.

3. Utility identification using marking tape and trace wire

4. Soil and aggregate materials.

5. Compaction and testing.

1.2 REFERENCES:

A. American Association of State and Highway Transportation Officials (AASHTO) Publications:

1. M147: Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.

B. ASTM International (ASTM):

1. C33: Specification for Concrete Aggregates.

2. C150: Standard Specification for Portland Cement.

3. C618: Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.

4. D75: Standard Practice for Sampling Aggregates.

5. D421: Practice for Dry Preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants.

6. D422: Test Method for Particle-Size Analysis of Soils.

7. D698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3).

8. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft3).

9. D2321. Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

10. D2419: Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.

11. D2434: Standard Test Method for Permeability of Granular Soils (Constant Head).

12. D2487: Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).

13. D2488: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

14. D2940/D2940M: Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.

15. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

16. D4832: Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

17. D6938: Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

C. Occupational Safety and Health Administration (OSHA) Standards and Regulations:

1. 29 CFR 1926, Subpart P: Safety and Health Regulations for Construction, Excavations.

D. Measurement and Payment: Section 01 29 01

1.3 CLASSIFICATION OF EXCAVATION:

A. Excavation is considered incidental to other work for the entire project and is not classified. Excavation is not classified, except where rock excavation is authorized outside specified or indicated limits of excavation.

1.4 DEFINITIONS:

A. Percent Compaction or Compaction Density: The field dry density of compacted material, expressed as a percentage of the maximum dry density.

B. Field Dry Density or Field Density: In-place density as determined by ASTM D6938 (Nuclear Method).

C. Maximum Dry Density: Laboratory density as determined by ASTM D698 (Standard Proctor) or ASTM D1557 (Modified Proctor) and occurring at the optimum moisture content of the soil being tested.

D. Pipe Embedment: Comprised of the following or combination thereof:

1. Foundation: Required only when the native trench bottom does not provide a firm working platform or the necessary uniform and stable support for the install pipe.

2. Bedding: Placed directly underneath the pipe and brings the trench bottom to grade. Provides a firm, stable, and uniform support of the pipe.

3. Haunching: From bottom of pipe to springline.

4. Initial Backfill: From top of bedding or foundation to 6 inches above top of pipe, unless noted otherwise.

5. Final Backfill: Above the initial backfill to the original or finish grade or to a level below that required for the trench restoration area.]

6. Backfill: Includes initial and final backfill.

1.5 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00.

1. Temporary excavation and shoring drawings for worker protection in accordance with the Contract Documents.

2. Gradation analysis.

3. Dewatering plan including disposition of groundwater.

4. Materials Sources: Name of source, location, date of sample, sieve analysis, and laboratory compaction characteristics.

5. Test and Evaluation Reports:

a. Field density testing reports: Provide results from field density testing of prepared subgrade and compacted fill.

b. Grain-size analysis.

c. Laboratory compaction characteristics of soils.

d. Water content.

6. Compaction method and removal sequence of shoring.

7. Mix design and test results for controlled low-strength material (CLSM).

1.6 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Sample backfill materials in accordance with ASTM D75.

C. Provide testing in accordance with Part 3 of this section.

1. Employ an independent testing laboratory accredited by the American Associates of State Highway and Transportation Officials (AASHTO) Accreditation Program.

2. Minimum of three years experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations. Minimum of three references from previous work.

D. Protect excavations by shoring, bracing, sheet piling, underpinning or other methods required to prevent cave-in of loose soil. Protection shall be in accordance with OSHA 29 CFR 1926, Subpart.

1.7 DELIVERY STORAGE AND HANDLING:

A. Comply with the requirements specified in Section 01 66 10.

B. Provide geotextile fabric in rolls wrapped with protective covering to protect geotextile fabric from mud, dirt, dust, and debris. Label each roll of geotextile fabric with number or symbol to identify production run.

C. Protect geotextile fabric from sunlight during transportation and storage. Do not leave geotextile fabric exposed to sunlight for more than two weeks during installation operations.

PART 2 - PRODUCTS

2.1 BACKFILL MATERIALS:

A. Suitable Material: Material from on-site excavation or permitted off-site sources that meets all of the specified requirements for its intended use and is not unsuitable. Wet subgrade material which meets other requirements for suitable material is suitable.

B. Unsuitable Material: Material that fails to meet requirements for suitable materials; or contains any of the following:

1. Organic clay, organic silt, or peat; as defined in ASTM D2487 and visually determined in ASTM D2488.

2. Vegetation, wood, roots, leaves, and organic, degradable material.

3. Stones or rock fragments over 6 inches in any dimension.

4. Porous biodegradable matter, excavated pavement, construction debris, rubbish, or refuse.

5. Ice, snow, frost, or frozen soil particles.

C. Foundation Material: Native material if solid foundation. MDOT 34R-34G if soft foundation or water present. CLSM if stable foundation cannot be achieved with stone.

D. Granular Fill: MDOT 23A crushed limestone.

E. Sand:

1. MDOT Class II granular material free from clay balls, organic matter, and other deleterious substances.

F. Select Borrow:

1. Well-graded, coarse-grained soil; classified in accordance with ASTM D2487.

2. Soil particles: ASTM C33, physical property requirements.

3. Gradation: Table 31 23 33-1.

Table 31 23 33-1

Sieve Designation (Square Mesh)	Percentage Passing (By Weight)
3 inches (75 mm)	100
1-1/2 inches (37.5 mm)	70-100
3/4 inches (19.0 mm)	50-85
No. 4 (4.75 mm)	30-60
No. 50 (300 micrometers)	10-25
No. 200 (75 micrometers)	0-5

G. Controlled Low-Strength Material (LSM):

1. CLSM shall consist of a mixture of portland cement, aggregate, fly ash, water, and admixtures conforming to the following:

a. Portland Cement: ASTM C150.

b. Aggregate: ASTM C33

c. The soluble sulfate content shall not exceed 0.3 percent by dry weight.

d. Water: Potable quality.

e. Water-Cement Ratio: 3.5:1, maximum.

f. Fly Ash: ASTM C618.

g. The minus No. 200 (75 micrometer) sieve fraction shall be non-plastic.

2. Proportion the CLSM to achieve a flowable, non-segregating, self-consolidating non-shrink slurry. The water content shall not exceed that required to provide a mix that will flow, can be pumped, and will maintain the soil in suspension without segregation of the aggregate while being placed. Proportion the aggregate, cement, and water either by weight or by volume. Use as little cement for each cubic yard of material produced as necessary to make the CLSM flowable.

3. The unconfined compressive strength at seven days shall be minimum of 50 psi and a maximum of 100 psi per ASTM D4832.

4. The temperature of the CLSM discharged into the trench shall be below 90 degrees F.

5. Prior to construction, perform trial mixes of the CLSM to verify placing and strength characteristics. Determine compressive strength per ASTM D4832. Notify Engineer at least one week prior to trial mix preparation. Submit mix and test results to Engineer.

2.2 EQUIPMENT:

A. Compaction equipment shall be capable of consistently achieving the specified compaction requirements.

2.3 UTILITY IDENTIFICATION:

A. Marking Tape: Use type specifically manufactured for marking and locating underground utilities. Acid- and alkali-resistant polyethylene film, 6 inches wide with minimum thickness of 0.004 inch, minimum strength of 1,750 psi lengthwise and 1,500 psi crosswise. Provide tape manufactured with foil core at least 0.35-mil thick to enable detection by metal detection when tape is buried up to 3 feet deep. Tape shall bear continuous printed inscription describing specific utility. Tape color shall follow APWA ColorCodes and shall be as follows, Blue, Potable water systems.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify that dewatering support systems are in place before commencing with excavation.

B. Verify that excavation safety and support systems meeting the requirements of OSHA 29 CFR 1926, Subpart P are in place before commencing with excavation.

1. Minimum slopes for laying back excavations or materials are contained in OSHA 29 CFR 1926, Subpart P; Appendices A and B.

2. Minimum requirements for shoring and bracing are contained in OSHA 29 CFR 1926, Subpart P; Appendix C.

C. Verify that fill materials submittals have been accepted by Engineer before commencing with work requiring the use of these materials.

D. Verify that erosion and sediment control measures are in place and functioning properly.

E. Immediately notify the Engineer if unexpected subsurface facilities or suspected hazardous materials are encountered during excavation. Discontinue affected work in area until notified to resume work.

3.2 PREPARATION:

A. Contact 811, Michigan No Dig for utility markouts prior to the start of work.

B. Underpin adjacent structures that could be damaged by excavation work.

C. Cut pavement with saw or pneumatic tools to prevent damage to remaining pavement. Dispose of large pieces of demolished pavement before proceeding with excavation.

3.3 PROTECTION OF IN-PLACE CONDITIONS:

A. Comply with the requirements specified in Section 01 14 14.

B. Support and protect from damage – existing pipes, poles, wires, fences, curbs, property line markers, and other features or structures which must be preserved in place to avoid being temporarily or permanently relocated.

C. Excavation Near Existing Structures:

1. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.

2. Excavate test pits near, or at intersection with, existing utilities or underground structures to determine the exact location of existing features.

D. Excavation Near Private Property:

1. Record existing condition of features on adjacent property by means of dated photographs or cameras. Provide construction photographs according to Section 01 32 33.

2. Enclose uncut tree trunks adjacent to work in wooden boxes of such height necessary to protect tree from injury due to piled material, equipment, or operations. Operate excavating machinery and cranes so as to prevent injury to overhanging branches and limbs.

3. Protect cultivated hedges, shrubs, and plants which would otherwise be damaged by the work.

4. Where protection of vegetation is not possible, dig up, temporarily transplant, and maintain. After active construction operations in the area have ceased, transplant vegetation to the original positions and provide water and nursery care until growth is re-established.

5. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces. Provide protection on pavement or tracks if construction traffic is unavoidable.

3.4 RESTORATION:

A. Restore private property and structures promptly. Begin restoration work within 24 hours of when damage occurred.

B. Existing surfaces, features, or utilities that are to remain but are damaged during construction shall be repaired or replaced to at least the condition in which they were found immediately before work began, unless noted otherwise.

C. Damaged Trees To Remain: Cut all damaged branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint. Replace damaged trees which subsequently die or continue to show lack of growth due to damage, one year after substantial completion.

D. Cultivated Vegetation: Includes, but is not limited to: hedges, shrubs, and plants. Vegetation that is damaged shall be replaced with equal kind and of at least the quality before work began.

3.5 TRENCH EXCAVATION:

A. Provide dewatering system to allow for working conditions in dry, stable soil. Properly dispose of water to avoid damage to property and in accordance with laws and regulations. Lower groundwater table prior to excavation and keep a minimum of 24 inches below lowest excavation subgrade until structure has sufficient strength to withstand soil and water pressures.

B. Sheet and brace trenches, excavations, and adjacent structures to comply with laws and regulations and to provide protection of life, property, and the Work. Where close sheeting is necessary, drive to prevent adjacent soil from entering excavation. Remove close sheeting only when removal would not damage property or the Work. Sheeting left in place shall be cut off 18 inches below ground surface.

C. Preserve material below and beyond the lines of excavations.

D. Locate stockpiled excavated material at least 3 feet from edge of excavations to prevent cave-ins or bank slides.

E. Open excavations overnight ae not permitted unless otherwise authorized by the Owner or Engineer. Steel plating shall not be used to protect any open excavations authorized by the Owner or Engineer. Plating shall be a minimum of ¾" thick and be of adequate size to support all legal axle loads. Plating shall overlap existing pavement by at least two feet on all sides of the edge of the excavation.

3.6 AUTHORIZED OVER-EXCAVATION:

A. Remove rock for a depth of 6 inches and backfill with bedding material.

3.7 UNAUTHORIZED EXCAVATION:

A. Contractor is responsible for backfilling unauthorized excavations with bedding material.

3.8 BACKFILL:

A. Fill to lines and grades necessary to provide finish grades.

B. Use a placement method that does not disturb or damage other work or existing features.

C. Maintain fill materials within 3 percent of optimum moisture, to attain required compaction density.

D. Place and compact material in equal continuous layers.

E. Maximum compacted depth is 6 inches for aggregate materials and 8 inches for soil materials, unless noted otherwise.

3.9 CLSM PLACEMENT:

A. Provide batching equipment to obtain the proper weights of soil, cement, water, and admixtures. Measuring devices shall be sensitive to a 2 percent variation above or below the actual weights required. Volumetric batching may be used, provided the same accuracy required for weight batching is maintained.

B. Design and operate the mixers used for mixing the CLSM so that the CLSM, as discharged from the mixer, is uniform in composition and consistency throughout each batch.

C. Place the CLSM so that it flows easily into all openings in the excavated trench. In some cases, such as trenches on a slope, a stiffer mix may be required to prevent it from flowing down the trench. In this case, use vibration to ensure that the CLSM completely fills all spaces.

D. Do not place backfill above the pipe until the CLSM has reached the initial set. Place and maintain a 6-inch cover of moist backfill cover until additional backfill is placed. If the ambient temperature is 50 degrees F or less, place an additional 6-inch cover of backfill over the moist backfill cover prior to the end of the working day.

E. Whenever freezing temperatures are imminent, maintain the CLSM at a temperature of not less than 50 degrees F for 24 hours after placement. The temperature of the mix shall be 50 degrees F or greater at the time of placement. Monitor the temperature by placing a thermometer in the CLSM immediately after sampling at the placement site. When freezing weather appears imminent, make ready at the placement site materials that may be required for protection of the CLSM. Delay placement of CLSM until adequate provisions for protection against weather are made. Do not place CLSM bedding in pipe trenches when the trench bottom or walls are frozen or contain frozen material. Backfill placed as cover over the CLSM is prohibited from containing any frozen material.

3.10 COMPACTION:

A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified, or if not specified - at a level slightly lower than optimum.

B. Compaction Density: Provide trench backfill densities according to Table 31 23 33-2. The values listed are minimum percentages, unless noted otherwise.

Table 31 23 33-2	
Area	Percentage of Maximum Dry Density as defined by ASTM D1557 (Modified Proctor)
Trench Backfill, under pavement, slabs	95
Trench Backfill, under structures or within 25 feet of structures	95
Trench Backfill, through embankment	98
Trench Backfill, under exterior concrete slab and sidewalks	95
Trench Backfill, open or grassed areas	95

3.11 UTILITY IDENTIFICATION:

A. Install marking tape over all site utilities, 12 inches below finish grade.

3.12 FIELD QUALITY CONTROL:

A. Compaction shall be deemed to comply with the specifications when no more than 1 test of any 3 consecutive tests falls below the specified relative compaction. The one test shall be no more than 3 percentage points below the specified compaction. The Contractor shall pay the costs for any retesting or additional testing of work not conforming to the specifications.

B. Where compaction tests indicate a failure to meet the specified compaction, the Contractor will take additional tests every 50 in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

C. Perform particle size distribution and gradation analyses using ASTM D422 and following standard practices in ASTM D421. Perform one test for every source and submit results to Engineer for acceptance. Repeat the moisture density test for every 5,000 cubic yard of material used.

D. Perform field density testing in accordance with ASTM D1556, ASTM D2167, or ASTM D6938.

E. Evaluate field density test results in relation to maximum dry density as determined by testing material in accordance with ASTM D1557 (Modified Proctor).

F. Perform tests in accordance with ASTM D4318 to determine Liquid Limit, Plastic Limit and Plasticity Index and submit test results to Engineer for acceptance. Minimum of one test per 5,000 cubic yard of soil for use as fill material and whenever classification of material is in doubt as determined by the Engineer.

G. Location of field density tests shall be mutually acceptable to testing laboratory and the Engineer as recommended by the Engineer.

H. Frequency of field density tests:

Table 31 23 33-3	
Area	Frequency
Trench (Structural Areas)	1 per lift for every 1,000 linear feet of trench
Trench (Non-Structural Areas)	1 per alternate lift for every 1,000 linear feet of trench
Regardless of the minimum testing frequency specified, field density tests shall be performed by the Contractor in sufficient number for the Contractor's quality control purposes to ensure that specified density is obtained.	

I. Owner may retain the services of an independent testing laboratory to conduct confirmatory testing and inspection.

3.13 ADJUSTING:

A. Shrinkage:

1. Backfill to a height above finished grade which will allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.

2. Supply specified materials and build up low places, without additional cost if embankment or backfilling settles so as to be below the indicated level for proposed finished surface at any time before final acceptance of the work.

3.14 PROTECTION:

A. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.

3.15 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

SECTION 31 50 00

EXCAVATION SUPPORT SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide excavation support systems as indicated and in compliance with Contract Documents.

B. Design, furnish and install excavation support systems to maintain lateral support, prevent loss of ground, limit soil movements to acceptable limits and protect from damage existing and proposed improvements including pipelines, utilities, structures, roadways, railroads and other facilities.

C. The requirement of specified excavation support systems does not relieve the Contractor from the responsibility of furnishing and installing proper temporary excavation support systems in other areas where required.

D. Common types of excavation support system include, but are not limited to; singular or multiple stages comprised of cantilevered or internally braced soldier piles and lagging, steel sheetpile wall, timber sheetpile wall, trench box, or combinations thereof. Trench box temporary excavation support system is only acceptable for pipe or utility trench excavations approved by the Engineer. Temporary unsupported open cut excavation with stable sloping sides is allowed in accordance with OSHA requirements.

E. Extraction of steel sheetpile wall, timber sheetpile wall, or solider piles are not permitted unless otherwise indicated, specified or approved by the Engineer.

F. Wherever the word "sheeting" is used in this section or on the contract documents, it shall be in reference to any type of excavation support system specified except trench box.

G. Construction of the excavation support systems shall not disturb the existing infrastructure or the completed proposed infrastructure. Damage to such infrastructure shall be repaired at Contractor's expense.

H. Adjacent structures are those that are bear upon soils above the proposed excavation depth and within a distance equal to twice the total depth of the excavation away from the closest edge of the excavation. Monitor and protect adjacent structures as specified and indicated.

I. Bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the excavation support systems. Pay for all claims, costs and damages that arise as a result of the Work performed at Contractor's expense.

1.2 REFERENCES:

A. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29: Subpart P - Excavations, Trenching and Shoring.

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01 33 00.

1. Submit the following qualifications four (4) weeks prior to the construction:

a. Qualifications of Contractor's excavation support system designer as specified in Paragraph 1.04.C.

b. Qualifications of Contractor's excavation support system installer as specified in Paragraph 1.04.D.

c. Qualifications of Contractor's excavation support system installation supervisor as specified in Paragraph 1.04.E.

2. Submit an excavation support plan stamped and signed by a Registered Professional Engineer at least two weeks prior to start of the construction. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor remains responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:

a. Proposed excavation support system(s), details, location, layout, depths, extent of different types of support relative to existing features and the permanent structures to be constructed, and methods and sequence of installation and removal.

b. Certificate of Design: Refer to Section 01 33 00.

c. A list of all design assumptions, including safety factors used for the excavation support system(s) and all lateral pressures used for each system.

d. Requirements of dewatering during the construction.

e. Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.

f. List of equipment used for installing the excavation support systems.

3. Submit a Construction Contingency Plan specifying the methods and procedures to maintain excavation support system stability if the allowable movement of the adjacent ground and adjacent structures is exceeded.

4. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:

   a. Survey locations of the excavation support systems, including coordinates of the ends and points of change in direction.

   b. Type of the excavation support system.

   c. Elevations of top and bottom of the excavation support systems left in place.

1.4 QUALITY ASSURANCE:

A. Provide in accordance with Section 01 43 00.

B. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P - Excavation, Trenching, and Shoring".

C. Prepare design, including calculations and drawings, under the direction of a Professional Engineer registered in the State of Michigan where the project is located and having the following qualifications:

   1. Not less than ten (10) years experience in the design of specific excavation support systems to be used.

   2. Completed not less than five (5) successful excavation support system projects of equal type, size, and complexity within the last five (5) years.

D. Excavation Support System Installer's Qualifications:

   1. Not less than three (3) year experience in the installation of similar types and equal complexity as the proposed system.

   2. Completed not less than three (3) successful excavation support systems of similar type and equal complexity as the proposed system.

E. Install all excavation support systems under the supervision of a supervisor having the following qualifications:

   1. Not less than five (5) years experience in installation of systems of similar type and equal complexity as the proposed system.

   2. Completed at least five (5) successful excavation support systems of similar type and equal complexity as the proposed system.

F. All welding shall be performed in accordance with AWS D1.1.

1.5 DESIGN CRITERIA:

A. Design of excavation support systems shall meet the following minimum requirements:

1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, temporary stockpiles, construction loads, roadways, railroads, and other surcharge loads.

2. Design a bracing system to provide sufficient reaction to maintain stability.

3. Limit movement of ground adjacent to the excavation support system to be within the allowable ground deformation as specified.

4. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of braced temporary excavation support systems shall not be less than 5 feet below the bottom of the excavation.

5. Design excavation support systems to withstand an additional 2 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.

6. The design location of the excavation support wall shall be determined such that the installed wall and bracing system components are all located outside the limits of the permanent infrastructure. Construction tolerances shall be considered in determining the plan location.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Provide in accordance with Sections 01 66 10 and as specified.

B. Store sheeting and bracing materials to prevent sagging which would produce permanent deformation. Keep concentrated loads which occur during stacking or lifting below the level which would produce permanent deformation of the material.

1.7 PROJECT CONDITIONS:

A. Subsurface Conditions: Refer to Section 00 21 13.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Structural Steel: All soldier piles, wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36.

B. Steel Sheet Piling: ASTM A572, continuous interlocking type.

C. Timber Lagging Left in Place: Pressured treated per AWPA standards.

D. Concrete: Section 03 30 00.

E. Tamping tools adapted for backfilling voids after removal of the excavation support system.

F. Provide specific trench box sizes for each pipe and utility excavation with structural capacity of retaining soil types as described in OSHA's 29 CFR Part 1926 Subpart P.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Installation of the excavation support systems shall not commence until the related earth excavation and dewatering submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed.

B. Install excavation support systems in accordance with the excavation support plan.

C. Do not drive sheeting within 100 feet of concrete less than seven (7) days old.

D. Carry out program of excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures of Work ongoing or previously completed.

E. Bottom of the trench box excavation support system shall be above the pipe invert prior to installing the pipe.

F. Notify utility owners if existing utilities interfere with the excavation support system. Modify the existing utility with the utility owner's permission or have the utility owner make the modifications at Contractor's expense.

3.2 REMOVAL OF EXCAVATION SUPPORT SYSTEMS:

A. Sheeting shall be left in place unless otherwise indicated.

B. When indicated, remove the excavation support system without endangering the constructed or adjacent structures, utilities, or property. Immediately backfill all voids left or caused by withdrawal of excavation support systems with bank-run gravel, screened gravel or select borrow by tamping with tools specifically adapted for that purpose.

C. The excavation support system left-in-place shall be cut-off a minimum of 2 feet below the bottom of the next higher foundation level or a minimum of 5 feet below finished grade.

D. Conduct survey of the locations and final cut-off elevations of the excavation support systems left in place.

3.3 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

SECTION 33 05 12

HORIZONTAL DIRECTIONAL DRILLING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This Specification covers the installation of water service pipe by horizontal directional drilling (HDD) for residential connections and local road crossings. Horizontal directional drilling is a trenchless excavation method which is accomplished in two phases. The first phase consists of drilling a pilot hole along a designed directional path. The second phase consists of pulling the pipe into the pilot hole. Horizontal directional drilling is accomplished using a specialized horizontal drilling rig with ancillary tools and equipment.

B. The proposed HDD installations will be part of a lead or galvanized steel pipe replacement program. Addresses of houses where pipes are to be replaced will be provided to the Contractor prior to the start of work and as work progresses.

1.2 SCOPE OF WORK:

A. The work shall be performed in accordance with the Contract Documents and shall include all labor, equipment, and materials necessary to accomplish, but not limited to, the following tasks:

1. Transportation of all equipment, labor, and material to and from each property.

2. Setup of horizontal drilling rig or rod pusher, and other ancillary equipment at each property.

3. Drilling the pilot hole along the alignment as defined for the replacement. Using a downhole guidance system, maintain survey control along the entire alignment to ensure compliance with specified tolerances. Survey control shall be by inclination and azimuth of drill bit. In addition, a separate surface tracking system shall be constantly monitoring the depth, location, pitch and roll of the drill bit throughout the full depth and length of the alignment.

4. Reaming the pilot hole, if needed, to a diameter suitable for installation of the fabricated carrier pipe pull section(s).

5. Installation of the pipe section(s) including any necessary joining and capping for the final connections. Final connections of pipeline installations will be done by the Contractor.

6. Transportation and proper offsite disposal of all excess drilling fluid and cuttings.

7. Clean-up and restoration of all work areas.

1.3 REFERENCES:

A. American Petroleum Institute (API): RP 13B-1, 1990. Standard Procedure for Field Testing Water-Based Drilling Fluids, First Edition, Dallas, Texas

B. American Society of Civil Engineers (ASCE):

1. ASCE Manuals and Reports on Engineering Practice No. 108, Pipeline Design for Installation by Horizontal Directional Drilling, Second Edition (2014)

2. Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, ASCE/CI 38-02

C. American Society for Testing and Materials (ASTM): ASTM F2620 – Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

D. Common Ground Alliance (CGA): CGA Best Practices - Version 14.0 "The Definitive Guide for Underground Safety and Damage Prevention"

E. HDD Consortium: Horizontal Directional Drilling Good Practices Guidelines, 3rd Edition

1.4 TEMPORARY WORKSPACE AND ACCESS:

A. Workspace and access are defined by the Engineer.

1.5 QUALITY ASSURANCE:

A. HDD Firm shall have been performing this specialty work for a minimum of 2 years and completed 5 projects of similar complexity successfully within that period.

B. HDD operations shall be performed under the full-time supervision of a drill rig superintendent having the following minimum requirements:

1. Not less than five (5) years experience in HDD projects of similar type and equal complexity as the proposed HDD project.

2. Successfully installed a minimum of 500 water service lines ranging from ¾" to 2" in diameter.

3. Trained and certified at a minimum in the following:

a. OSHA 10-Hour Construction Industry

b. First Aid and CPR

c. Traffic Protection

d. Electrical Awareness

e. Equipotential Bonding and Grounding

C. Horizontal directional drilling shall be conducted in accordance with these specifications and the standards of care for the industry. Refer to the Horizontal Directional Drilling Good Practice Guidelines and the CGA Best Practices.

1.6 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00:

1. The following information shall be submitted:

a. Qualifications of the HDD Firm.

b. Qualifications of the HDD Firm's proposed drill rig superintendent.

c. Qualifications of the HDD rig operator.

d. Safety plan including company safety manual and emergency procedures.

2. All procedures, descriptions, and shop drawings shall be submitted not less than 2 weeks prior to commencing any horizontal directional drilling activities at each site. These include but are not limited to:

a. A detailed schedule and description of procedures for pipe delivery, pilot hole drilling, reaming, testing and pull back.

b. Traffic control plan.

c. Cut sheet of pilot hole location instrumentation/guidance systems.

d. Cut sheet of the drill rig or rod pusher and its pullback and torque capacities.

e. Method of collection, permits required, and location for disposal of all drilled spoils and excess drilling mud.

f. Layout drawings showing: placement of pipe adjacent to streets; locations of topside equipment within the rig side and pipe side workspace.

3. During the HDD operations the Contractor shall submit daily progress reports to the Engineer. The report shall include the work performed, potential conflicts with other aspects of the project, and the progress at the end of each day.

4. Construction Contingency Plan specifying the methods and procedures to overcome construction hazards, such as, but not limited to: damage to all adjacent

utilities (i.e., water, drainage); encountering subsurface obstructions during pilot hole drilling and pipeline pull-back; pipeline misalignment (horizontal/vertical); drilling mud loss, hole collapse, pipe collapse, sinkholes in the overburden soils.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Provide ¾" to 2-inch Type K copper pipe as required or as directed by the Engineer.

B. All other materials required for construction shall also be supplied by Contractor.

2.2 WATER:

A. The Contractor shall be responsible for obtaining any water required. Provide documentation from the water supplier authorizing use or withdrawal of the water. Contractor is responsible for any payments required for the use and withdrawal of water.

2.3 INSTRUMENTATION:

A. Contractor shall at all times provide and maintain a tracking system which will accurately locate the pilot hole, measure drill string axial and torsional loads, and measure drilling fluid discharge rate and pressure. The Engineer shall have access to these instruments and their readings at all times.

PART 3 - EXECUTION

3.1 PROTECTION OF UNDERGROUND UTILITIES:

A. Contractor shall undertake the following steps prior to commencing drilling operations in a location which may contain underground facilities.

1. Contact 811, Michigan No Dig for utility markouts prior to the start of work.

2. Positively locate and stake all existing lines, cables, or other underground utilities including exposing any facilities which are located within 10 feet of the designed drilled path.

3. Modify drilling practices and downhole assemblies to prevent damage to existing utilities. Where in doubt as to locations of buried structures, conduct additional potholing as required to identify the location of existing infrastructure.

B. The Contractor shall, at no additional cost to the Owner, be responsible for repairing any utility or structure which is damaged during construction activities.

3.2 PILOT HOLE:

A. Conduct drilling operations using materials and equipment in accordance with HDD Consortium, Horizontal Directional Drilling Good Practices Guidelines. Operator's log book shall include as a minimum:

1. Pipe installation number or street address.

2. Depth of bore path start, midway, and finish.

3. Pitch and steering commands required.

4. Notes including obstructions or other performance observations.

B. Record Drawing: Contractor shall provide a drawing and a tabulation of coordinates, referenced to the drilled entry point, which accurately describes and documents the location and type size of each pipeline installed by HDD methods.

3.3 PULL BACK:

A. Pull Back: The pipe shall be pulled back in a continuous non-stop operation in order to prevent the pipe from seizing.

B. Pulling Loads: The maximum allowable tensile load imposed on the pipe pull section shall be equal to 50 percent of the specified minimum yield strength of the pipe.

C. Torsional Stress: A swivel shall be used to connect the pull section(s) to the reaming assembly to minimize torsional stress imposed on the section(s).

D. Pull Section Support: The pull section(s) shall be supported throughout the entire pull back procedure so that the pull section(s) move freely above and below ground such that the pipe is not damaged.

E. External Collapse Pressure: The pull section shall be installed in the reamed hole in such a manner that external pressures are minimized. Any damage to the pipe resulting from external pressure during installation shall be the responsibility of Contractor.

3.4 DRILLING FLUID CONTROLS:

A. Composition: The composition of all drilling fluids proposed for use shall be in accordance with API Specification 13A; API Recommended Practice 13B; and API Bulletin 13D and submitted. No fluid shall be utilized that does not comply with permit requirements and environmental regulations.

B. Recirculation: May be used at the Contractor's discretion, but is not required.

C. Disposal: Disposal of excess drilling fluids shall be the responsibility of Contractor and shall be conducted in compliance with all environmental regulations, right-of-way and

workspace agreements, and permit requirements. Procedures for the disposal of drilling fluids shall be submitted to the Engineer for review.

D. Inadvertent Returns: Contractor shall employ his best efforts to maintain full annular circulation of drilling fluids. Drilling fluid returns at locations other than the entry and exit points shall be minimized. In the event that annular circulation is lost, Contractor shall take steps to restore circulation. Inadvertent surface returns of drilling fluids shall be immediately contained with hand placed barriers (i.e. hay bales, sands bags, silt fences, etc.) and collected using pumps as practical. If the amount of the surface return is not great enough to allow practical collection, the affected area shall be diluted with fresh water and the fluid will be allowed to dry and dissipate naturally.

E. Small collection sumps less than 5 cubic yards may be used if the amount of surface return exceeds that which can be contained with hand placed barriers. If the amount of surface return exceeds that which may be contained and collected using small sumps, drilling operations shall be suspended until surface return volumes are controlled.

F. Inadvertent Depressions, Sinkholes, Loss of Ground or Support for Adjacent Utilities: Contractor shall be responsible for backfilling all lost ground and adjacent streets such that emergency vehicle access is maintained 24-hours a day. Utilities shall be supported to maintain their function.

3.5 JOINING PIPE SECTIONS

A. Contractor will not be permitted to use multiple segments of pipe to complete the new service line installation. Contractor shall use a single continuous segment of copper piping to complete all water service line replacements.

3.6 FIELD TESTING:

A. Keep detailed records where provided by independent testing agency; otherwise, all testing shall be done in the presence of the Engineer.

B. Drilling mud testing shall be in general accordance with the equipment and procedures identified in API RP13B.

3.7 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

SECTION 33 10 00

WATER UTILITIES AND SERVICE CONNECTIONS

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Pipe and fittings for water distribution piping including municipal distribution piping and residential service lines, accessories and appurtenances.

1.2 REFERENCES:

A. American National Standards Institute (ANSI)

1. NSF Standard 61: Drinking Water System Components – Health Effects

B. American Society of Mechanical Engineers (ASME):

1. B16.1: Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.

2. B16.18: Cast Copper Alloy Solder Joint Pressure Fittings.

3. B16.22: Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.

C. ASTM International (ASTM):

1. A53: Standard Specifications for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

2. A126: Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

3. A307: Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

4. A536: Standard Specification for Ductile Iron Castings.

5. A743: Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.

6. B88: Standard Specification for Seamless Copper Water Tube.

D. American Water Works Association (AWWA):

1. C104/A21.4: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

2. C105/A21.5: Polyethylene Encasement for Ductile-Iron Pipe Systems.

3. C110/A21.10: Ductile Iron and gray Iron Fittings, 3 Inch Through 48 Inch for Water and Other Liquids.

4. C111/A21.11: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

5. C116/A21.16: Protective Fusion Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile Iron and Gray Iron fittings for Water Supply Service.

6. C150/A21.50: Thickness Design of Ductile Iron Pipe.

7. C151/A21.51: Ductile-Iron Pipe, Centrifugally Cast, for Water.

8. C153/A21.53: Ductile Iron Compact Fittings, 3-Inch through 24-Inch and 54-Inch Through 64-Inch for Water Service.

9. C500: Metal-Seated Gate Valves for Water Supply Service.

10. C509: Resilient-Seated Gate Valves for Water Supply Service.

11. C550: Protective Interior Coatings for Valves and Hydrants.

12. C600: Installation of Ductile-Iron Water Mains and Their Appurtenances.

13. C602: Cement-Mortar Lining of Water Pipelines in Place - 4 in. and Larger

14. C651: Disinfecting Water Mains

15. C800: Underground Service Line Valves and Fittings.

16. C810-17: Replacement and Flushing of Lead Service Lines

E. United States Environmental Protection Agency (EPA)

1. EPA Guidance: Steps to Lead Safe Renovation, Repair and Painting

F. Factory Mutual (FM):

1. FM Approved: Factory Mutual Approval Guide.

G. NSF International (NSF):

1. 61: Drinking water system components Health effects

1.3 DEFINITIONS:

A. Appurtenances: Additional piping items as required to provide a complete piping system suitable to convey water as specified and intended. These items may or may not be specified, but are necessary to complete the piping system.

1.4 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00.

1. Pipe materials.

2. Pipe fittings.

3. Pipe couplings.

4. Pipe thrust restraint.

5. Valves.

6. Accessories.

7. Appurtenances.

8. Water purity test results indicating chlorine residual.

B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

C. Instructions: Provide manufacturer's installation instructions for pipe, valves, curb stops and boxes, corporation stops, and copper water service piping.

D. Field Test Reports: Provide results for hydrostatic and bacteriological tests.

E. Project Record Documents: Provide actual locations of piping mains, valves, connections, curb boxes, corporation stops, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

F. Health and Safety Plan for all work occurring on site. Plan should include information related to site safety protocols, confined space entry, emergency conditions, and general conformance with OSHA and MiOSHA requirements.

1.5 SPARE PARTS:

A. Comply with the requirements specified in Section 01 61 00.

1.6 QUALITY ASSURANCE:

A. Comply with the requirements specified in Section 01 43 00.

B. Perform Work in accordance with Owner standards.

C. Contractor shall perform all service line replacement work in accordance with AWWA C810-17: Replacement and Flushing of Lead Service Lines.

D. Valves: Manufacturer's name, UL/FM and pressure rating marked on valve body.

E. Materials used shall comply with American Iron and Steel (AIS). Materials specified that do not comply with AIS shall not be used.

1.7 DELIVERY STORAGE AND HANDLING:

A. Comply with the requirements specified in Section 01 66 10.

B. During loading, transportation and unloading, prevent damage to pipes and fittings. Load and unload each pipe under control at all times. Under no circumstances will a dropped pipe be used unless inspected and accepted by Engineer. Place skids or blocks under each pipe in the shop and securely wedge pipe during transportation.

C. Deliver and store valves in shipping containers with labeling in place.

1.8 WARRANTY:

A. Provide standard product warranties for piping materials and as required by Owner.

PART 2 - PRODUCTS

2.1 WATER PIPE:

A. General:

1. Fittings: Suitable for and compatible with pipe material and class with which they are used.

2. All material for watermains shall be NSF/ANSI 61 compliant.

B. Ductile Iron Pipe and Fittings:

1. Manufacturers: U.S. Pipe, Clow, American, or acceptable equivalent product.

2. Thickness design conforming to AWWA C150 / A21.50.

3. Pipe: AWWA C151 / 21.51, Pressure Class 350 for mechanical and push on joints in buried service. Minimum thickness Class 52.

4. Fittings: Ductile iron, AWWA C110 / A21.10 or C153 / 21.53, match wall thickness of adjacent pipe.

5. Joints: AWWA C111 / A21.11, rubber gasketed for push-on or mechanical joint.

6. Lining: Double thickness cement mortar conforming to AWWA C104 / 21.4.

7. Exterior Coating: Asphaltic coating, AWWA C151 / A21.51, for buried pipe and fittings.

8. Jackets: AWWA C105 / A21.5 polyethylene jacket.

9. Bolts and Nuts:

   a. Tee head bolts and hexagonal nuts: AWWA C111 / A21.11.

   b. Number, size, and length: AWWA C111 / A21.11.

   c. Material: Type 316 stainless steel.

C. Copper Tubing

1. ASTM B 88, Type K, annealed, supplied in a continuous coil with no joints if possible, and complete with, if joints are required, compression type flared joint couplings.

2. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper.

3. Joints: Compression connection or AWS A5.8, BCuP silver braze.

4. Only lead-free solder shall be used.

5. Working Pressure: Minimum of 100 psi.

2.2 VALVES:

A. Gate Valves:

1. Manufacturers: Mueller or East Jordan Iron Works.

2. Valves to conform to NSF Standard 61.

3. AWWA C509 or C515, iron body, bronze trim, non-rising stem with square nut and right-hand open direction.

4. Single wedge meeting ASTM A536 with resilient seat.

5. Mechanical joint ends.

6. Conventional packing or double O rings. Valves capable of being repacked or O-rings replaced while under pressure.

7. Type 316 stainless steel bolts and bronze nuts for stuffing box follower.

8. Internal and external wetted parts to be coated with a fusion bonded epoxy in accordance with AWWA C550.

9. Provide one operating wrench of length to operate deepest valve.

B. Ball Valves:

1. Manufacturers: Nibco, NCI, or acceptable equivalent product.

2. Class 600, 1,000 psi WOG rated full port ball type valves, each complete with a forged brass or bronze body with compression inlet and outlet ends, forged brass cap and blowout-proof stem, solid forged brass Teflon coated ball, rubber seats and stem seals, and a removable lever handle.

3. Valves shall be up to 2 inches. Ball valves greater than 2 inches are unacceptable.

2.3 MANUAL OPERATORS:

A. Operator force not to exceed 40 lbf under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 40 lbf.

B. Operator to be self-locking type or be equipped with self-locking device.

C. Worm and gear operators to be one-piece design worm-gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators to have threaded steel reach rods with internally threaded bronze or ductile iron nut.

D. Buried service operators on valves shall have a 2-inch AWWA operating nut. Enclose moving parts of valve and operator in housing to prevent contact with the soil.

E. Buried valves shall have extension stems, bonnets, and valve boxes.

2.4 VALVE BOXES:

A. Manufacturers: Tyler Pipe or acceptable equivalent product.

B. Provide cast-iron valve boxes, rated for vehicular traffic.

C. Extension type with slide-type adjustment, flared base and 3/16-inch minimum thickness of metal.

D. Cast the word "WATER" in cover. Adapt box length, without full extension, to depth of cover required over pipe at valve location.

2.5 BEDDING AND COVER MATERIALS:

A. As specified in Section 31 23 33.

2.6 THRUST RESTRAINT:

A. Mechanical Joint Restraint

1. Manufacturers: Ebba Iron Megalug or acceptable equivalent product.

2. Restraint devices for pipe consisting of multiple gripping wedges incorporated into a follower gland meeting requirements of AWWA A21.10.

   a. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, retaining full mechanical joint deflection during assembly and allowing joint deflection after assembly.

   b. Provide actuation of the gripping wedges ensured with torque limiting twist off nuts.

   c. Provide restraint devices listed by UL, 3 inch through 24 inch size and designed by Factory Mutual, 3 inch through 12 inch size.

3. 350 psi working pressure rating with 2 to 1 minimum safety factor

4. Gland body, wedges and wedge actuating components: Grade 65-45-12 ductile iron in accordance with ASTM A536.

5. Mechanical joint restraint incorporated into the design of the follower gland.

B. Push-On Restrained Joint Pipe: Provide joint restraint and conforming joint to AWWA C111/21.11, fabricated to be easily disassembled. Provide assembly and disassembly kits.

2.7 MECHANICAL COUPLINGS:

A. Manufacturer: Smith-Blair or acceptable equivalent product.

B. Dresser Style 38, long sleeve unless otherwise shown or specified. Pressure rating at least equal to that of associated pipeline.

2.8 ACCESSORIES:

A. Tapping Sleeves: Ductile- or cast-iron, split-sleeve type with flanged or grooved outlet, and with bolts, follower rings and gaskets on each end of sleeve suitable for maximum working pressure of 150 psi. Bolts shall be Type 304 stainless steel with square heads and hexagonal nuts. Longitudinal gaskets and mechanical joints with gaskets shall be as recommended by manufacturer of sleeve. Comply with AWWA C223

B. Tapping Valves: Provide tapping valves that conform to gate valves, specified herein. Provide tapping valves suitable for installation with tapping sleeves and pipe used, designed for minimum water working pressure of 150 psi, and have clear waterway equal to full nominal diameter of valve. Ends to comply with ANSI B16.1, Class 125.

C. Tapping saddles shall have ASTM A395 ductile iron body and Type 316 stainless steel straps and hardware.

D. All new fittings and accessories shall be 100% lead-free.

E. Corporation Stops

1. Manufacturers: Ford Meter.

2. Standard corporation stop thread conforming to AWWA C800 on the inlet end, with compression pattern flared tube coupling.

F. Service (Curb) Stops

1. Manufacturers: Ford Meter.

2. Water-works inverted-ground-key type, oval or round flow way, tee handle, without drain.

G. Tapping Saddles

1. For 4" diameter and smaller water mains.

2. Manufacturers: Smith-Blair or approve equal.

3. Saddle will comply with AWWA C800 and NSF61. Body shall be ductile iron meeting ASTM A536. Outlet to be threaded NPT and gasket shall be Buna-N conforming to NSF 61.

4. Single mounting straps shall be at least 2" while. Multiple straps shall each be 1-½" wide.

5. Bolts, nuts and washers shall be Type 304 stainless steel coated to protect from galvanic corrosion

6. Pressure rating of saddle shall meet or exceed rating of existing or new piping.

H. Parts shall be bronze with female compression-pattern flared tube coupling design for hydrostatic test pressure at least 200 psi.

I. Service Boxes: Cast iron box by Tyler Pipe. Service boxes shall be extension type of length required for depth of line, with either screw or slide-type adjustment. Boxes shall have housings of sufficient size to completely cover service stop or valve and shall be complete with the word "WATER" cast into the cover.

2.9 DISINFECTION CHEMICALS:

A. Refer to Section 33 13 00.

2.10 APPURTENANCES:

A. Provide appurtenances for a complete piping system suitable for operation, and in conformance with Project Documents.

2.11 SHOP PAINTING/COATINGS:

A. Unless noted otherwise, provide standard manufacturer paint and coatings for piping, valves, and accessories to prevent corrosion for the life of the component.

2.12 SHOP TESTING:

A. Test pipes, valves, and applicable accessories per manufacturer requirements, and as required by referenced Standards.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify existing conditions.

B. Mark pipe and fittings "Rejected" and remove from site when cracked or has received a severe blow.

3.2 PREPARATION:

A. Contact 811, Michigan No Dig for utility markouts prior to the start of work.

B. Ream pipe and tube ends and remove burrs.

C. Remove scale and dirt, on inside and outside, before assembly.

D. Prepare pipe connections to equipment with flanges or unions.

E. Machine cut with milling type cutters, knives, or saws. Chamfer cut ends of cut segments. Cutting by means of snap cutters, torch, or hammer and chisel is not allowed. Examine for possible cracks after cutting. Reject cracked sections of pipe.

F. Excavate pipe trench in accordance with Section 31 23 33 for work of this Section. Hand trim excavation for accurate placement of pipe and to remove soil from other nearby utilities.

3.3 WATER PIPE INSTALLATION:

A. Maintain separation of water main from sewer as follows:

1. Parallel Installation

a. Under normal conditions water mains shall be laid at least 10 feet horizontally from a sewer or sewer manhole. The distance shall be measured edge-to-edge.

b. Under unusual conditions when local conditions prevent a horizontal separation of 10 feet the water main may be laid closer to a sewer or sewer manhole provided that the bottom (invert) of the water main shall be at least 18 inches above the top (crown) of the sewer;

c. Where this vertical separation cannot be obtained, the sewer shall be constructed of AWWA approved water pipe, pressure tested in place without leakage prior to backfilling; and

d. The sewer manhole shall be of watertight construction and tested in place.

2. Crossing

a. Under normal conditions water lines crossing sewers shall be laid to provide a separation of at least 18 inches between the bottom of the water line and the top of the sewer whenever possible

b. Under unusual conditions when local conditions prevent a vertical separation described, the following construction shall be used:

(1) Sewers passing over or under water mains shall be constructed of AWWA approved water pipe, pressure tested in place without leakage prior to backfilling;

(2) Water lines passing under sewers shall, in addition, be protected by providing:

(a) A vertical separation of at least 18 inches between the bottom of the sewer and the top of the water line;

(b) Adequate structural support for the sewers to prevent excessive deflection of the joints and the settling on and breaking of the waterline; and

(c) That the length of the water line be centered at the point of the crossing so that joints shall equidistant and as far as possible from the sewer.

c. No water pipes shall pass through or come in contact with any part of a sewer manhole.

B. Before assembly, remove dirt and chips from inside pipe and fittings.

C. Install ductile iron piping and fittings to AWWA C600.

D. Joints and Couplings

1. Push-on Joints

a. Insert gasket into groove bell. Apply thin film of nontoxic gasket lubricant over inner surface of gasket in contact with spigot end.

b. Insert chamfered end into gasket. Force pipe past it until it seats against socket bottom.

2. Mechanical Joints

a. Wire brush surfaces in contact with gasket and clean gasket.

b. Lubricate gasket, bell, and spigot with soapy water.

c. Slip gland and gasket over spigot, and insert spigot into bell until seated.

d. Seat gasket and press gland firmly against gasket.

e. After bolts inserted and nuts made finger-tight, tighten diametrically opposite nuts progressively and uniformly around joint by torque wrench.

E. Form and place concrete for thrust blocks at each fitting or change of direction of pipe main.

F. Establish elevations of buried piping to ensure not less than 4-feet of cover.

G. When pipe laying not in progress, close open ends of pipe with temporary watertight plugs. If water in trench, do not remove plug until danger of water entering pipe passed.

H. Backfill trench in accordance with Section 31 23 33

3.4 VALVE INSTALLATION:

A. Set valves on solid bearing.

B. Center and plumb valve box over valve. Set box cover flush with finished grade.

C. Install tapping sleeves and tapping valves in accordance with manufacturer's recommendations.

D. Install valves according to applicable AWWA Standards.

E. Set box so top is flush with finished surface and so box does not bear on valve, or pipe.

3.5 SEWER LATERAL INSPECTION

A. Contractor shall be required to video document the condition of each residential sewer lateral prior to the start of any service line replacement or related work.

B. Documentation may be made from the house to the connection at the municipal sewer using a lateral push camera or the inspection may be made from the municipal sewer to the house using a lateral camera launched from a CCTV inspection camera located within the municipal sewer. Inspections starting at the house will be completed from a cleanout outside of the house. The inspection will be completed from the municipal sewer to the house if no external cleanout exists.

C. The camera equipment will be provided with a suitable distance-reading device to measure the location of the camera in the lateral, to an accuracy of ±0.5% of the length of the inspection.

D. Inspection video shall be a high-definition, color inspection MPEG for verification of existing internal sewer line conditions. The camera shall be provided with a light to adequately illuminate the interior of the pipeline during inspection.

E. The Contractor shall utilize a camera that has sufficient cable to provide a complete and continuous inspection in a single direction. No breaks, stops or pauses of the video during recording will be permitted.

F. If the inspection cannot be completed in a single direction due to an existing defect in the pipeline or because of bends or changes in direction that do not allow the camera to pass, a reversal inspection from the opposite end of the sewer lateral will be attempted.

G. Contractor will only be required to video document the condition of the sewer lateral. Defect coding of observations made during the documentation process are not required.

H. Contractor shall direct the camera through the lateral at a rate that will permit the condition within the lateral to be fully observed. Rate of inspection shall not exceed 0.50 ft / sec (30 ft / min).

I. The Contractor will notify the Engineer immediately when emergency condition such as a collapsed, surcharged or blocked sewer is observed.

J. Removal of Equipment that Becomes Stuck in the Sewer

1. Contractor is fully responsible for the inspection of the lateral. The Contractor should terminate the inspection if, in the Contractor's opinion, the camera may become lodged in the pipe due to a defect, change in direction, or other reason. The Contractor will be responsible to remove equipment stuck in the lateral at no additional cost to the Owner.

2. Notify the Engineer immediately if equipment becomes lodged within the sewer lateral.

3. Contractor shall initially attempt to remove such equipment for at least 1 hour. Following this initial attempt, advise the Engineer if the equipment cannot be freed and mark the position on the surface over the sewer where the equipment is lodged.

4. The Engineer will communicate to the property owner and the Owner, that the equipment cannot be freed and the need to arrange to have an excavation made to remove the equipment. The Contractor will be responsible for coordinating recovery efforts with the property owner and the Engineer. The Contractor will arrange to have an excavation made to remove the equipment within 1 hour after ending an initial attempt at removing the equipment without using excavation methods.

5. Refer to "Sewer Lateral Repair" below for additional information.

6. Upon removing the equipment and if necessary, repairing the lateral, Contractor shall repeat inspection of the lateral in accordance with the Contract Documents. No additional compensation will be made for reinspection of the sewer line as a result of the Contractor's equipment becoming stuck, and subsequently being removed, from the sewer lateral.

7. The Contractor shall not receive any additional compensation for equipment recovery and / or replacement costs, equipment and labor downtime, other incidental costs, work delays, re-mobilization, or re-scheduling of work should the equipment become stuck.

K. Submit video documentation in an MPEG format on a weekly basis and within 10 working days of inspection. Failure to submit video documentation will result in payment for this work item being withheld from the Contractor's payment application with no additional compensation being made by the City for withholding payments to the Contractor. Submission of poor quality documentation that does not allow for reasonable viewing, in the opinion of the Engineer, of the conditions within the sewer will be rejected. The Contractor will be required to re-televise and document the condition of the sewer lateral with no additional compensation being made for this rework.

L. Video files shall be submitted to the Engineer on an external hard drive or data stick. Inspection video will be saved with the file name of "XXX_YYYY.Z" where:

1. XXX represents the house number

2. YYYY represents the street name. Use only a 2-letter acronym to designate the word "Street", "Avenue", "Road", etc. No space(s) will be placed in the street name.

   a. St – Street

   b. Av – Avenue

c. Rd – Road

d. Bd – Boulevard

e. Ay – Alley

f. Wy - Way

3. Z represents the video number. Use "1" for the initial inspection effort and "2" for the subsequent reversal inspection, if necessary.

4. Example: Complete video inspection of the sewer lateral at 123 Main Street. File name will be "123_MainSt.1".

   Example: Partial video inspection of the sewer lateral at 123 Main Street where the initial inspection was abandoned because of a defect in the line. File name will be "123_MainSt.1" for the initial inspection video file and "123_MainSt.2" for the subsequent reversal inspection video file.

3.6 SEWER LATERAL REPAIR

A. Damaged segments of the residential sewer lateral will be replaced as exposed during the service line replacement work.

B. The lateral will be repaired using SDR 26 PVC pipe and a flexible Fernco coupling to connect the new piping to existing.

C. New piping will be of the same nominal diameter as existing.

D. Prior to final connection, Contractor will flush the sewer line to remove backfill and debris that may have entered the sewer during repair of the sewer.

E. Repair, backfill, and surface restoration will be completed in the same day.

F. The Contractor will not receive compensation for repair of sewer lateral piping observed during the lateral inspection to be in a structurally competent condition that is damaged by the Contractor during the replacement of water service lines.

3.7 WATER SERVICE LINE CONNECTIONS AND REPLACEMENT:

A. Residential Notifications

1. The Engineer will coordinate the initial notification to homeowners whose service line were determined to be lead, galvanized or other non-copper material and will need to be partially or completely replaced. This initial notification will request permission to replace the service line.

2. Up to two subsequent follow-up notification efforts will be made by the Engineer, as necessary, in an attempt to obtain authorization to replace the service line. The Engineer will document the efforts to obtain the authorization.

3. The Contractor is required to provide support to the Engineer, as necessary, to obtain authorization to replace the service line.

B. The Contractor shall coordinate work with the Engineer and local residents in order to minimize disruptions to residents and provide as much advance notice as possible with regard to upcoming work.

C. The Contractor will be responsible to document pre-construction conditions at each work site.

D. Service Line Replacement – General

1. Definitions

a. Complete replacement: Replacement of the entire service line, including curb stop and box, from the corporation stop at the municipal water main to the existing curb stop and from the existing curb stop to the water meter inside the residence.

b. Partial replacement, public side: Replacement of the entire service line, including curb stop and box, from the corporation stop at the municipal water main to the existing curb stop.

c. Partial replacement, private side: Replacement of the entire service line, including curb stop and box, from the existing curb stop to the water meter inside the residence.

2. The Engineer will provide the Contractor with a database of information collected during the Phase V. This database will provide guidance to the Contractor regarding the extent, full or partial replacement, of the service line replacement work to be completed.

3. Prior to starting the replacement work, the water supply to the service line and the residence shall be shut off to avoid release of particulate lead into the house caused by vibration of the service during any excavation. The service line to be removed shall be isolated by shutting off appropriate valves at each end of the area to be removed.

4. Saw cut square and remove existing concrete or bituminous material as necessary or directed by the Engineer to facilitate service line replacement. Sidewalks and driveways, as applicable, will be cut at the nearest construction or control joint.

5. Contractor shall utilize appropriate trench and excavation shoring.

6. Contractor shall protect existing utilities and sewer lateral during the work. The Contractor will be responsible to repair any utilities damaged or disrupted during the work at no additional cost to the Owner.

7. Contractor is required to remove any fully exposed lead, galvanized or other non-copper service line material and associated fittings that are not scheduled to be used as part of the active service line. Existing service line material and associated fittings not exposed during the service line replacement work may be abandoned in place. Waste material shall not be buried on-site. Contractor is required to remove, transport and properly dispose of all waste materials at an off-site facility. Contractor is responsible for all permits and fees associated with the removal and disposal of waste material.

8. New service line pipe shall be measured and placed with enough material to replace existing service line piping with a single continuous piece of pipe. Contractor shall not use couplings to connect multiple pieces of pipe to form a single run of pipe.

9. Provide water service components, including corporation stop, Type K copper pipe, curb stop, curb box, and required fittings and couplings.

10. New corporation stops, curb stops and curb boxes will be installed. Existing curb stops and boxes will be removed and disposed of by Contractor. Existing corporation stops will be closed and abandoned in place.

11. New water service piping shall be installed from curb box to the house using horizontal directional drilling (HDD) methods. Work from the municipal water main to the curb box shall be completed using open cut and HDD methods as site conditions dictate.

    a. Contractor may need to use an intermediate HDD launching / receiving pit in the event of an extremely long service line or the presence of existing utilities.

12. New water service piping shall be installed with a minimum of four feet of cover.

13. Contractor shall provide and install fittings as required to make connections between new and existing infrastructure.

14. Contractor shall place a common masonry brick under the new curb stop such that the curb stop rests on top of the brick and is provided with a stable foundation.

15. In order to reduce the amount of material displacement and lead particulate, Contractor shall use a pipe cutter or similar shearing device to cut lead and galvanized service lines as opposed to a tool that would use a sawing or other abrasive action.

16. Contractor shall be equipped with appropriate safety equipment when working with lead and galvanized piping.

17. Wall Penetration

    a. Contractor will penetrate the wall of the house from the inside to the outside in order to install new service line.

    b. Upon installation of new service line, contractor will seal the wall penetration with a non-shrink grout to ensure that no groundwater is able to pass through the opening made for the service line. The penetration will be sealed on both the inside and outside of the wall.

18. Install a sampling port upstream of the meter that will allow a water sample to be collected. The port will consist of a tee fitting with a ball valve on the downstream (between the tee and the meter) run side of the tee and another ball valve along the branch side of the tee. Install short segments of copper piping as required to facilitate construction of the sampling port and installation of the ball valves.

19. After all required piping has been replaced and connections have been completed, flush the water from an outside connection (such as hose-bib or hose leading from the house side of the meter installation) to remove any particles in the service line and near point-of-entry. The flushing is best done, if possible and practical, before the meter is connected in the service using a "jumper" or straight pipe in place of the meter. The straight pipe will allow for a higher velocity flush and protects the meter from potential damage from lead pipe and other construction-related fragments. Flush at full velocity for at least 10 minutes.

20. Restoration

    a. Temporary restoration is completed by contractor(s) when lead, galvanized, or other non-copper material was observed at the curb stop or confirmed inside the home. This observance dictates that the service line be replaced. Areas of temporary restoration will be disturbed only to the extent necessary to complete the work.

    b. Restoration will not occur until the service line is either partially or completely replaced. Restoration of disturbed areas will be the responsibility of the service line Contractor.

c. Upon completion of the service line replacement, restoration will consist of crushed stone in areas where roadway, sidewalk and driveway were removed and full depth sand backfill of excavations in grassed areas. Similar materials will be used by the service line Contractor to maintain these areas until final restoration is completed.

d. Final restoration of pavement, concrete or grassed areas will be completed under a separate contract. The service line contractor will be responsible to maintain site restoration until the restoration contract is awarded to a new contractor.

21. The Contractor shall not backfill the excavation until the Engineer has recorded a photograph of the service line replacement work and the installation has been approved by the Owner.

E. Permits

1. The Contractor will be required to obtain, pay for, and maintain all permits as required by local, state and federal rules, regulations and laws. The City of Flint will not charge a fee for permits. The following permits are either anticipated or may need to be acquired to complete the work.

a. Traffic Control: Maintenance and rerouting of traffic and closing streets in order to maintain a safe and efficient work area. Contractor will be required to coordinate detours and road closures with the Owner and local emergency services dispatcher on a weekly basis.

b. Plumbing: Moving the residential water meter more than two feet in any direction inside the home after replacing the private side of the service line.

c. Excavation / Street Cut: Excavation and street cut work is conducted in a City of Flint street.

d. Water Services

e. Disposal: Disposal of waste material.

f. SHPO: Work occurring in the SHPO Zone of the City. An archaeologist will be on site to inspect excavations in this area. No backfill of the excavation will be completed without the archaeologist's approval. Contractor should plan and price the work in this area accordingly

3.8 LEAD PAINT PROTECTION:

A. Contractors are required to use lead safe work practices when working in homes constructed before 1978.

B. All power tools used must be equipped with a high-efficiency particulate air (HEPA) exhaust control to collect dust generated during the completion of the work.

C. Contractor shall contain the work area to prevent the escape of dust and debris.

1. The work area is the area that may become contaminated during the work. The size of the work area may vary depending on the method used to disturb lead-based paint and the amount of dust and debris that is generated as a result. The work area must be protected by plastic sheeting applied to the floor, ground or other applicable surfaces to prevent contamination of the home or exterior, from dust generated by the work.

2. The EPA's Renovation, Repair and Painting Rule requires that the work area be protected by plastic sheeting that extends a minimum of 6 feet for interior projects and 10 feet for exterior projects in all directions from the location where paint will be disturbed. For exterior renovations within 10 feet of the property line, vertical containment or equivalent extra precautions are required. The Rule further requires that protective plastic sheeting extend far enough from the location of paint disturbance so that all dust or debris generated by the work remains within the area protected by the plastic. The entire portion of the home or exterior that is protected by plastic sheeting, however large, is the work area.

3. Clearly post warning signs and establish barriers (tape, fencing, etc.) to prevent unauthorized persons and pets from entering the work area. Signs should be in the primary language of the occupants and contain the text "Warning – Lead Work Area" and "Poison, No Smoking or Eating".

D. Work Inside the House

1. Remove all objects from the work area, including furniture, rugs, and window coverings, or cover them with plastic sheeting with all seams and edges taped or otherwise sealed.

2. Cover the floor, including carpet, with taped-down plastic sheeting in the work area 6 feet from the area of paint disturbance or a sufficient distance to contain the dust, whichever is greater. If a vertical containment system is employed, floor covering may stop at the vertical barrier, providing it is impermeable, extends from floor to ceiling, and is tightly sealed at floors, ceilings, and walls.

3. Close windows and doors in the work area. Doors must be covered in plastic sheeting. When the work area boundary includes a door used to access the work area it must be covered in a way that allows workers to pass, but also confines dust

and debris to the work area. Cover the door with two layers of protective sheeting as described herein:

a. Cut and secure one layer of sheeting to the perimeter of the door frame. Do not pull the sheeting taut. Rather, leave slack at the top and bottom of the door before taping or stapling.

b. Cut a vertical slit in the middle of the sheeting leaving 6" uncut at the top and bottom. Reinforce with tape.

c. Cut and secure a second layer of sheeting to the top of the door.

4. Close and cover all open ducts in the work area with taped-down plastic sheeting.

5. All dust and debris generated during the work should be completely cleaned and removed from the property.

6. Ensure that all personnel, tools, materials, and other items, including the exteriors of containers of waste, are free of dust and debris before leaving the work area.

E. Work Outside the House

1. Cover the ground with plastic sheeting or other disposable impermeable material extending 10 feet beyond the perimeter of surfaces where the work will occur or a sufficient distance to collect falling paint debris, whichever is greater. If the work will affect surfaces within 10 feet of the property line, then vertical containment or equivalent extra precautions must be erected to prevent contamination of adjacent buildings and property.

2. Close all doors and windows within 20 feet of the work. On multi-story buildings, close all doors and windows within 20 feet of the work on the same floor as the work, and close all doors and windows on all floors below that are the same horizontal distance from the work.

3. Ensure that doors within the work area that will be used while the job is being performed are covered with plastic sheeting or other impermeable material in a manner that allows workers to pass through while confining dust and debris to the work area.

4. Contractor must take additional precautions as necessary in containing the work area to ensure that dust and debris from the work does not contaminate other buildings or other areas of the property or migrate to adjacent properties.

F. Contractor Protection

1. Contractor to comply with EPA, OSHA and Michigan guidelines regarding the protection of employees.

2. At a minimum, Contractor shall wear disposable protective clothing, disposable shoe covers to prevent tracking of dust from the work area, and headgear to protect the head from dust and debris.

3. Contractor shall utilize N-100 respiratory protection at a minimum when work will produce dust or paint chips.

4. Contractor is prohibited from smoking, drinking or eating in the work area.

G. Prohibited Practices

1. Use of open-flame burning or torching of painted surfaces.

2. Use of machines designed to remove paint or other surface coatings using high speed operation such as sanding, grinding, power planing, needle gun, abrasive blasting, or sandblasting, on painted surfaces is prohibited unless such machines have shrouds or containment systems and are equipped with a HEPA vacuum attachment to collect dust and debris at the point of generation. Machines must be operated so that no visible dust or release of air occurs outside the shroud or containment system.

3. Operating a heat gun on painted surfaces at temperatures greater than 1,100°F.

H. The work area should be cleaned thoroughly and left clean at the end of every day. The work area must be completely free of dust and debris.

1. Remind residents to stay out of the work area until the work is complete.

2. Vacuum the work area with a HEPA vacuum cleaner frequently.

3. Clean tools at the end of the day.

4. Collect all paint chips and debris and seal in a heavy-duty bag.

5. Remove the protective sheeting. Mist the sheeting before folding it dirty side inward, and either tape shut or seal in heavy-duty bags. Sheeting used to isolate contaminated rooms from non-contaminated rooms must remain in place until after the cleaning and removal of other sheeting. Dispose of the sheeting as waste.

6. The Contractor must clean all objects and surfaces in the work area and within 2 feet of the work area, cleaning from higher to lower:

a. Clean walls with a HEPA vacuum or wiping with a damp cloth.

b. Thoroughly vacuum all remaining surfaces and objects in the work area, including furniture and fixtures, with a HEPA vacuum. The HEPA vacuum must be equipped with a beater bar when vacuuming carpets and rugs.

c. Wipe all remaining surfaces and objects in the work area, except carpet or upholstery, with a damp cloth. Mop uncarpeted floors thoroughly.

d. Return items moved to complete the work to their original locations.

I. Containment of Waste

1. Collect and control all waste generated. This includes dust, debris, paint chips, protective sheeting, HEPA filters, dirty water, cloths, mop heads, wipes, protective clothing, respirators, gloves, architectural components and other waste.

2. Use heavy plastic sheeting or bags to collect waste. Seal the bag securely with duct tape. Consider double bagging waste to prevent tears. Large components must be wrapped in protective sheeting and sealed with tape.

3. Bag and seal all waste before removing it from the work area.

4. Waste that has been collected from work activities must be stored to prevent access to and the release of dust and debris. Waste transported from renovation activities must be contained to prevent release of dust and debris.

5. All waste should be disposed of according to EPA, OSHA and state requirements. Contractor is responsible for the removal, transport and legal disposal, including permits and fees, of all waste generated.

3.9 REPAIR:

A. Repair any existing utilities, structures, or features damaged during installation of water utilities to property owner's satisfaction, and at no cost to property owner.

3.10 FIELD TESTING:

A. Hydrostatically test newly laid pipeline and valved section thereof in accordance with AWWA C600.

B. Perform system flushing and disinfection per Section 33 13 00 Disinfecting of Water Utility Distribution.

3.11 FIELD PAINTING/COATINGS:

A. Repair any shop painting/coatings damaged during storage or installation to property owner's satisfaction.

3.12 ADJUSTING:

A. Coordinate with Engineer and Owner for any field adjustments. The Engineer and Owner reserve the right to reject any field adjustments.

3.13 PROTECTION:

A. Protect installed water utilities from damage throughout storage, installation, testing, and final approval.

3.14 CLOSEOUT ACTIVITIES:

A. Provide in accordance with Section 01 77 00.

END OF SECTION

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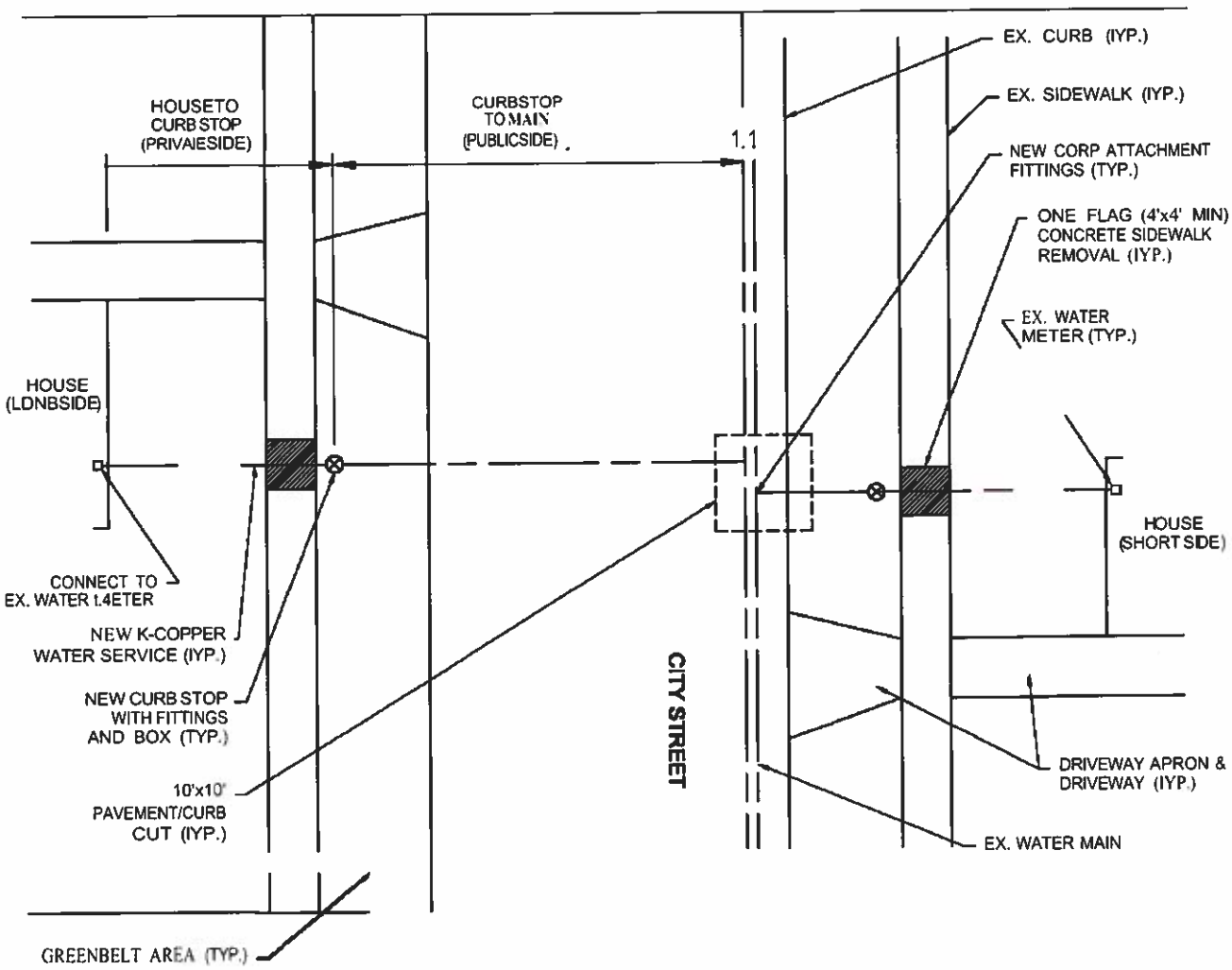
City of Flint
Phase VI Service Line Replacement (SLR)

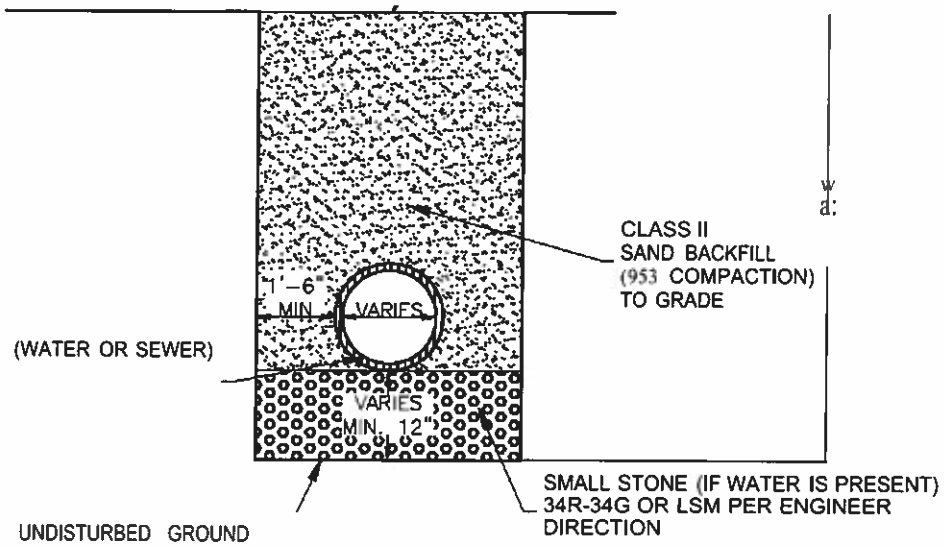


NOTES

1. ONLY REMOVE SIDEWALK TO THE EXTENTS NECESSARY TO COMPLETE SERVICE LINE INSTALLATION
2. SIZE OF NEW COPPER SERVICE LINE TO MATCH EXISTING
3. NEW CURB STOPS AND BOXES SHOULD BE LOCATED IN THE GREENBELT AREA UNLESS OTHERWISE DIRECTED BY THE ENGINEER
4. SERVICE LINE REPLACEMENT WORK OUTSIDE OF THE TYPICAL 10'X10' PAVEMENT CUT OR EXCAVATION AT THE CURB BOX SHALL BE COMPLETED USING HDD METHODS.

SERVICE LINE REPLACEMENT DETAIL

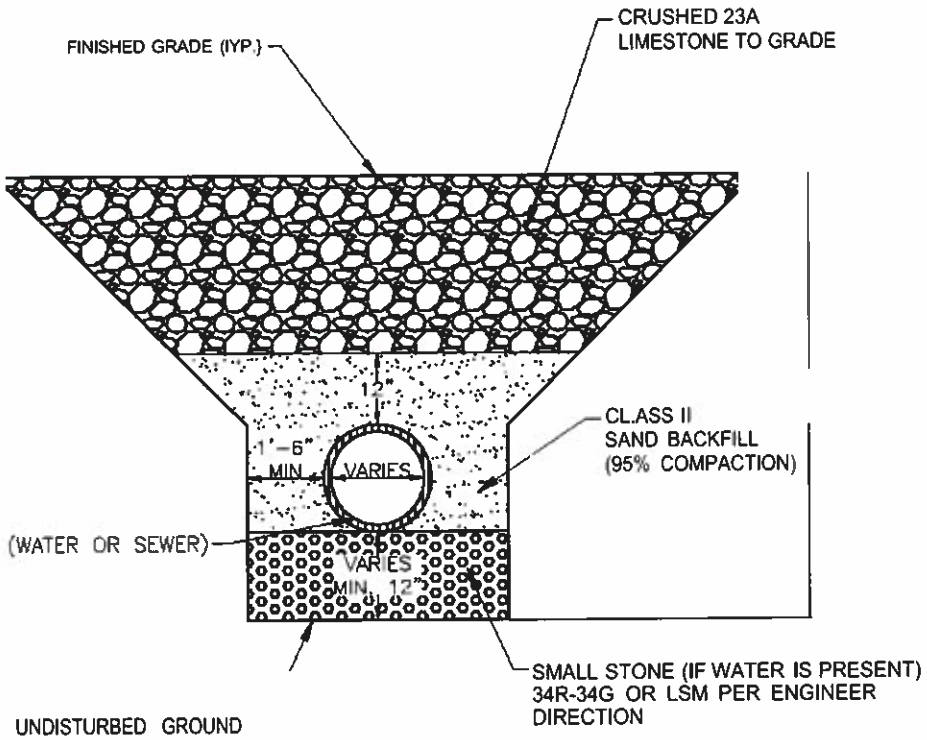
FAST START LEAD SERVICE LINE REPLACEMENT
19-XXX: 2019 PHASE VI SERVICE LINE
REPLACEMENT CITY OF FLINT, MI



NOTES

1. TRENCH SHALL BE FULLY SUPPORTED BY TRENCH BOXES OR OTHER SHORING METHODS AS PER OSHA STANDARDS.
2. ANY SOFT OR UNSUITABLE SOIL AT THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. IF DIRECTED BY ENGINEER, SOFT OR UNSTABLE SOIL SHALL BE REMOVED AND REPLACED WITH COMPACTED CRUSHED LIMESTONE OR LSM IF A STABLE TRENCH FOUNDATION CANNOT BE ACHIEVED USING CRUSHED STONE.
3. BACKFILL MATERIAL TO BE PLACED IN 12" LIFTS AND COMPACTED TO 95% DENSITY.

TRENCH DETAL, LANDSCAPE AREA



NOTES

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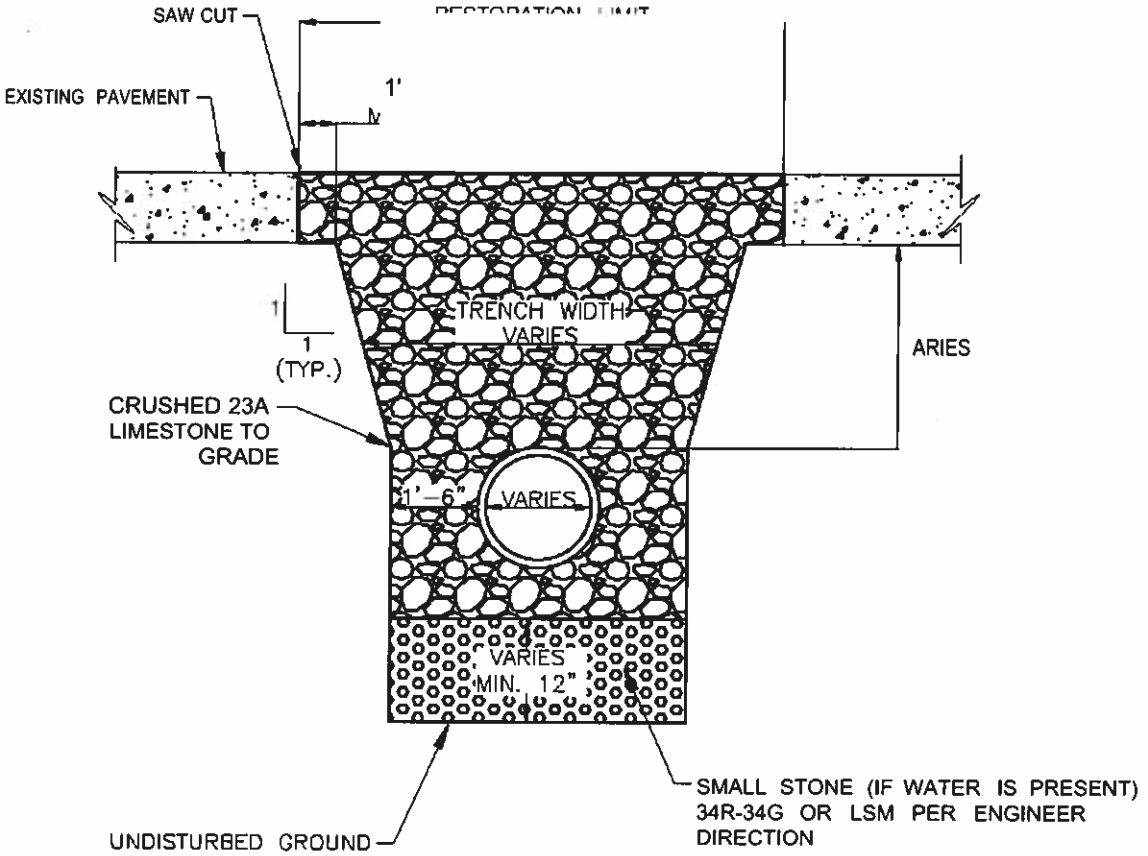
2. ANY SOFT OR UNSUITABLE SOIL AT niE BOTTOM OF niE TRENCH SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. IF DIRECTED BY ENGINEER, SOFT OR UNSTABLE SOIL SHALL BE REMOVED AND REPLACED WITH COMPACTED CRUSHED LIMESTONE OR LSM IF A STABLE TRENCH FOUNDATION CANNOT BE ACHIEVED USING CRUSHED STONE.
3. BACKFILL MATERIAL TO BE PLACED IN 12" LIFTS AND COMPACTED TO 95% DENSITY.

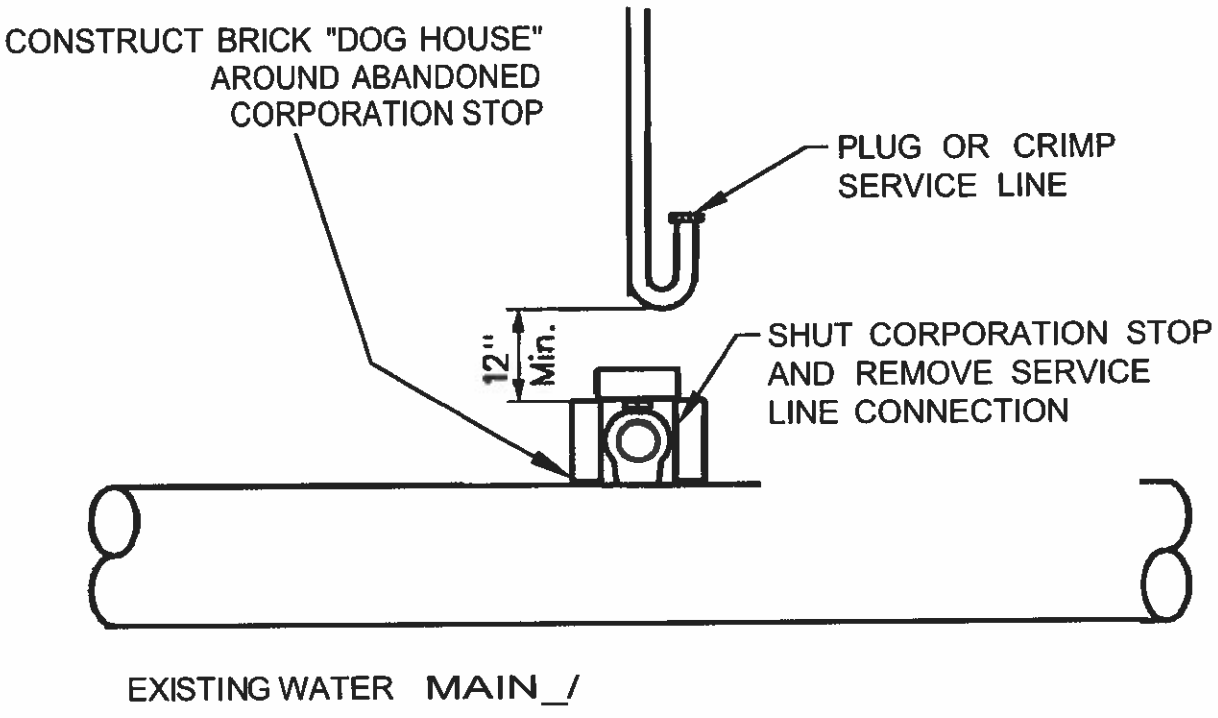
TRENCH DETAL, SIDEWALK AND DRIVEWAY AREAS



NOTES

1. TRENCH SHALL BE FULLY SUPPORTED BY TRENCH BOXES OR OTHER SHORING METHODS AS PER OSHA STANDARDS.
2. ANY SOFT OR UNSUITABLE SOIL AT THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. IF DIRECTED BY ENGINEER, SOFT OR UNSTABLE SOIL SHALL BE REMOVED AND REPLACED WITH COMPACTED CRUSHED LIMESTONE OR LSM IF A STABLE TRENCH FOUNDATION CANNOT BE ACHIEVED USING CRUSHED STONE.
3. BACKFILL MATERIAL TO BE PLACED IN 12" LIFTS AND COMPACTED TO 95% DENSITY.

TRENCH DETAIL, STREET AREAS



ABANDONED HOUSE SERVICE, CUT AND CAP

THE CITY OF FLINT, MI

MATERIAL DISPOSAL PLAN (MDP)

This form is to be submitted when removal and off-site disposal of excavation spoils, demolished material or other debris is required from a City of Flint project.

All excavated and demolished material from a construction site that is not to be reused must be properly removed and disposed at an approved facility. If the material is to be disposed of in the City of Flint, a permit or written authorization must be obtained from the City. If it is to be disposed of outside the City limits, documentation must be provided that the Contractor has complied with all the rules and regulations of the local community and that the disposal facility or property owner has given their approval to accept the material. One copy of this form must be completed for each disposal / stockpile site if the Contractor plans to use more than one site. A copy of this plan must be on file with the City and Engineer before initialing construction.

General Project Information and Certification

Date Submitted: _____ City of Flint Project No: _____

Contractor: _____ Project Name: _____

In submitting this Material Disposal Plan (MDP), the above named contractor expressly certifies that all material to be removed from the construction site will be hauled in accordance with all applicable federal, state, and local highway and traffic rules, regulations and laws, and that the Material Disposal Plan meets all federal, state, and local rules and regulations with regard to the removal and disposal of this material.

Contractor Contact: _____ Title: _____

Signature: _____ Date _____

Disposal of Material within the City of Flint

Is the material to be disposed of within the City of Flint? Yes[1] _____ No _____

[1] Attach a copy of the disposal permit if the above answer is "Yes".

Disposal of Material outside of the City of Flint

Is the material to be disposed of outside of the City of Flint? Yes[2] _____ No _____

[2] Provide the following information if material is to be removed from the site and disposed outside the City of Flint.

Disposal Site: _____ Site Address: _____

Municipality: _____ _____

Is a permit for the above municipality required? Yes[3] _____ No _____

[3] Attach a copy of the municipal permit

Directions to Site _____

_____

Disposal Facility / Property Owner Acknowledgement

I hereby acknowledge that i have agreed to accept material from_____, to be disposed of at our facility / property as described above and that it is my understanding that the above named contractor will meet all federal, state, and local rules and regulations with regard to the removal and transport of this material.

Facility Owner:: _____ Title: _____

Signature: _____ Date _____

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APPENDIX D

ANSI/AWWA C810-17

(First Edition)

American Water Works Association

Dedicated to the World's Most Important® Resource

Replacement and Flushing of Lead Service Lines

Effective date: Nov. 1, 2017.
First edition approved by AWWA Board of Directors June 11, 2017. This edition approved by AWWA Board of Directors June 11, 2017. Approved by American National Standards Institute Sept. 1, 2017.

STANDARD
American Water Works Association | Since 1881

Approved American National Standard
ANSI

AWWA Standard

This document is an American Water Works Association (AWWA) standard. It is not a specification. AWWA standards describe minimum requirements and do not contain all of the engineering and administrative information normally contained in specifications. The AWWA standards usually contain options that must be evaluated by the user of the standard. Until each optional feature is specified by the user, the product or service is not fully defined. AWWA publication of a standard does not constitute endorsement of any product or product type, nor does AWWA test, certify, or approve any product. The use of AWWA standards is entirely voluntary. This standard does not supersede or take precedence over or displace any applicable law, regulation, or code of any governmental authority. AWWA standards are intended to represent a consensus of the water industry that the product described will provide satisfactory service. When AWWA revises or withdraws this standard, an official notice of action will be placed on the first page of the Official Notice section of *Journal – American Water Works Association*. The action becomes effective on the first day of the month following the month of *Journal – American Water Works Association* publication of the official notice.

American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether that person has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review, and users are cautioned to obtain the latest editions. Producers of goods made in conformity with an American National Standard are encouraged to state on their own responsibility in advertising and promotional materials or on tags or labels that the goods are produced in conformity with particular American National Standards.

Caution notice: The American National Standards Institute (ANSI) approval date on the front cover of this standard indicates completion of the ANSI approval process. This American National Standard may be revised or withdrawn at any time. ANSI procedures require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036; 212.642.4900; or emailing info@ansi.org.

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DOI:http://dx.doi.org/10.12999/AWWA.C810.17

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The AWWA Standards Subcommittee on Lead Service Lines, which developed this standard, had the following personnel at the time of approval:

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M.K. Schmelling, DC Water, Washington, D.C. (AWWA)
R. Slabaugh, Arcadis, Indianapolis, Ind. (AWWA)
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The AWWA Standards Committee on Distribution System Operations and Management, which reviewed and approved this standard, had the following personnel at the time of approval:

Kanwal Oberoi, *Chair*

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* Liaison, nonvoting

Contents

All AWWA standards follow the general format indicated subsequently. Some variations from this format may be found in a particular standard.

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C810.*

I. Introduction.

I.A. *Background.* Replacement of lead service lines and subsequent flushing are important processes for ensuring the delivery of safe drinking water. The AWWA Policy Statement on Lead Service Line Management supports protecting public health through the reduction of exposure to lead in drinking water and encourages communities to develop a lead reduction strategy that includes identifying and removing all lead service lines over time. This standard is intended to describe essential procedures for the replacement of lead service lines, including the following elements: appropriate tools and techniques; flushing a service line after replacement; factors to consider in optimizing flushing; instructions to inform customers affected by the replacement, including additional risk reduction measures; and verification of lead level management prior to return to service. Although partial replacements should be discouraged, this standard also describes procedures for partial replacement and repair situations where full service line replacement is not possible or practical.

This is the first edition of this standard and will likely result in valuable feedback from first users of the standard. As such, it is anticipated that a second edition with additional information and guidance will be necessary and issued well before AWWA's regular five-year revision schedule for standards.

I.B. *History.* Development of this standard was authorized by the AWWA Standards Council in 2015 and was assigned to the AWWA Standards Committee on Distribution Systems Operations and Management. A Subcommittee on Lead Service Lines was formed to draft the standard. This first edition of the standard was approved by the AWWA Board of Directors on June 11, 2017.

I.C. *Acceptance.* In May 1985, the US Environmental Protection Agency (USEPA) entered into a cooperative agreement with a consortium led by NSF International (NSF) to develop voluntary third-party consensus standards and a certification program for direct and indirect drinking water additives. Other members of the original consortium included the Water Research Foundation (formerly AwwaRF) and the Conference of State Health and Environmental Managers (COSHEM). The

*American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

American Water Works Association (AWWA) and the Association of State Drinking Water Administrators (ASDWA) joined later.

In the United States, authority to regulate products for use in, or in contact with, drinking water rests with individual states.* Local agencies may choose to impose requirements more stringent than those required by the state. To evaluate the health effects of products and drinking water additives from such products, state and local agencies may use various references, including

1. Specific policies of the state or local agency.
2. Two standards developed under the direction of NSF†: NSF/ANSI 60, Drinking Water Treatment Chemicals—Health Effects, and NSF/ANSI 61, Drinking Water System Components—Health Effects.
3. Other references, including AWWA standards, *Food Chemicals Codex*, *Water Chemicals Codex*,‡ and other standards considered appropriate by the state or local agency.

Various certification organizations may be involved in certifying products in accordance with NSF/ANSI 60 and 61. Individual states or local agencies have authority to accept or accredit certification organizations within their jurisdictions. Accreditation of certification organizations may vary from jurisdiction to jurisdiction.

Annex A, "Toxicology Review and Evaluation Procedures," to NSF/ANSI 60 and 61 do not stipulate a maximum allowable level (MAL) of a contaminant for substances not regulated by a USEPA final maximum contaminant level (MCL). The MALs of an unspecified list of "unregulated contaminants" are based on toxicity testing guidelines (noncarcinogens) and risk characterization methodology (carcinogens). Use of Annex A procedures may not always be identical, depending on the certifier.

ANSI/AWWA C810 does not address additives requirements. Thus, users of this standard should consult the appropriate state or local agency having jurisdiction in order to

1. Determine additives requirements, including applicable standards.
2. Determine the status of certifications by parties offering to certify products for contact with, or treatment of, drinking water.
3. Determine current information on product certification.

---

* Persons outside the United States should contact the appropriate authority having jurisdiction.

† NSF International, 789 North Dixboro Road, Ann Arbor, MI 48105.

‡ Both publications available from National Academy of Sciences, 500 Fifth Street, NW, Washington, DC 20001.

II. Special Issues.

II.A. *Prioritizing Lead Service Line Replacement.* Suggested items to consider when prioritizing lead service line replacement follow (not in order of priority):

- Any lead service line that is physically disturbed by dig-ins, excavations, repairs, or similar activities.
- Existing partial lead service line replacements.
- Lead service lines supplying schools, day care centers, or other identified sensi- tive populations as defined by the USEPA.
- Lead service lines where sample results are more than 15 ppb or other estab- lished health levels.
- Lead service lines located in scheduled underground infrastructure work or street restoration work zones that could be replaced concurrently, minimizing any negative impact to customers.
- Multiple lead services within a compact area (cost containment).
- Length of lead pipe present in a particular service line.
- Consideration of presence of lead goosenecks and galvanized service lines.

II.B. *Optimizing Corrosion Control Treatment.* Corrosion of piping and solder can be a primary source of lead contamination in drinking water. Optimizing corrosion control treatment may help a utility to minimize this source of lead contamination. Utilities may consider appropriate corrosion control treatments that include pH adjustment, alkalinity adjustment, addition of corrosion inhibitors, and other corrosion control treatments. Additional guidance on applying corrosion control treatments can be found in the AWWA Manual of Water Supply Practice M58—*Internal Corrosion Control in Water Distribution Systems*, the AWWA "Optimized Corrosion Control Treatment Primer," and the 2015 *Journal - AWWA* article "Strategies for Assessing Optimized Corrosion Control Treatment of Lead and Copper" (these documents are available through the AWWA Lead Resource page: www.awwa.org/lead).

II.C. *Reuse or Replacement of Service Line Fittings, Valves, and Water Meters.* The scope of this standard covers replacement of lead service lines. Utilities may choose to reuse or replace the related fittings, valves (corporation stops and curb stops), and water meters, based on the site-specific age and condition of those components and based on the utility-specific replacement schedules and practices. The Reduction of Lead in Drinking Water Act requires that all newly installed pipes, fittings, and fixtures meet the current definition of "lead free." The reuse of existing fittings (that may or may not meet the current definition of "lead free") is allowed by the Reduction of Lead in Drinking Water Act if reused in their original locations.

II.D. *Utility Communication Planning for Lead in Drinking Water.* Water utilities are facing a new communications challenge related to lead in drinking water. Currently, utilities are required under the Safe Drinking Water Act to communicate lead risks when there is an exceedance of the lead action level as defined in the Lead and Copper Rule and annually as part of their consumer confidence reports. Utilities conducting mandatory lead service line replacements must meet specific outreach requirements targeting affected households. Beyond these requirements, many utilities also communicate lead exposure risks proactively in consumer confidence reports, on websites, and through other means.

Water utilities should be planning to communicate lead exposure risks in a proac- tive and targeted manner not only when lead service lines are repaired or replaced but also when routine maintenance work on water mains may disturb lead service lines. This change may dramatically alter the frequency of direct-to-customer lead communications and requires a new level of planning by utility managers and communicators. Although the water utility and public health communities have made significant strides in reducing lead exposure, public health advocates and regulatory agencies are looking closely at the contribution of lead at the tap from lead service lines particularly lead service lines that have been disturbed. Three typical scenarios raise concerns about elevated lead levels: lead service line replacement when required by the Lead and Copper Rule or proactively performed by the utility; infrastructure replacement when full or partial lead service line replacement occurs when other utility work is under way, such as during water main rehabilitation; and repairs to lead service lines.

Water providers should consider building on current communication plans to provide additional information to customers regarding lead and lead service line replacement. AWWA has assembled *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement* as a tool for preparing and expanding these communications (http://www.awwa.org/Portals/0/files/resources/publicaffairs/pdfs/FINALeadServiceLineCommGuide.pdf).

This guide is designed to help water utilities build on current communication strategies to address these new areas of concern and manage the increased frequency of communication with customers. It provides utilities with customizable messages and templates to communicate with customers in a variety of ways to better protect public health. For brevity, the content of the guide will not be repeated here.

Additional guidance on utility communications can be found on the Lead Service Line Replacement Collaborative website: http://www.lslr-collaborative.org/.

II.E. *Grounding of Electrical Circuits on Piping.* If the lead service line is replaced with a nonmetallic pipe or if a nonconductive plastic coupling (dielectric coupling) is used within a few feet of the home, the home owner may need to take additional measures to ensure the structure has sufficient grounding. Historically, connection to the home piping system was used for grounding the home's electrical system. By removing the underground metal piping, an alternative grounding strategy may be needed.

All metal water systems should be "bonded." Failure to adequately bond the potable water piping systems to the electrical system increases the potential for both fire and electrocution should the piping system become energized (see National Electric Code).

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products and/or processes described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* This standard is written as though the replacement and flushing work will be performed by the purchaser's (generally the utility's) personnel. Where the work is to be performed using a separate contract or as part of a contract for replacing service lines,* appropriate provisions should be included in the purchase documents to ensure the constructor is specifically instructed as to its responsibilities. The following information should be provided by the purchaser:

1. Standard used—that is, ANSI/AWWA C810, Replacement and Flushing of Lead Service Lines, of latest revision.
2. Whether compliance with NSF/ANSI 61, Drinking Water System Components—Health Effects, is required.
3. Details of other federal, state or provincial, and local requirements (Section 4).
4. Method of replacement to be used—open cut, trenchless on new route, or trenchless using existing route (Sec. 4.1).

III.B. *Modification to Standard.* Any modification of the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. This is the first edition of this standard.

V. Comments. If you have any comments or questions about this standard, please call the AWWA Engineering and Technical Services at 303.794.7711; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

*Refer to other AWWA standards and manuals for design criteria for various service line materials.

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ANSI/AWWA C810-17
(First Edition)

American Water Works Association
Dedicated to the World's Most Important Resource®

AWWA Standard

Replacement and Flushing of Lead Service Lines

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard describes essential procedures for the replacement of lead water service lines and flushing following replacement. Essential procedures include the following: appropriate tools and techniques; flushing a service line after replacement; factors to consider in optimizing flushing; and instructions to provide customers affected by the replacement, including additional risk reduction measures. This standard also describes procedures for partial replacement and repair situations where complete lead service line replacement is not possible or practical.

Sec. 1.2 Purpose

The purpose of this standard is to define the minimum process requirements for the replacement of lead service lines and for flushing following replacement.

Sec. 1.3 Application

This standard can be referenced in the purchase documents for the replacement of lead service lines and can be used as a guide for the appropriate replacement tools and techniques, flushing practices and procedures, communications with customers, and verification of successful completion. The stipulations of this standard apply when this document has been referenced and only to the extent referenced.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within the standard. In any case of conflict, the requirements of this standard shall prevail.

AWWA — *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement.*

Safe Drinking Water Act (SDWA), 42 USC* 300. USEPA†—Lead and Copper Rule (LCR), 40 CFR 141.

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Constructor:* The party who provides the work and materials for placement or installation.

2. *Corporation stop:* A valve attached to the water main to which a service line is connected. It is used to interrupt flow during installation or maintenance of the service line (see Figure 1).

3. *Curb stop:* A valve installed in the service line, generally at the property line, and accessible for operation from the surface of the ground for routinely interrupting flow through the service line (see Figure 1).

4. *Customer:* The person, company, or organization receiving potable water service from the utility to a specific premise.

5. *Gooseneck:* A sweeping bend in a service line where it connects to the water main, resembling the shape of a goose's neck that will allow soil movement without damaging the service line (see Figure 1).

6. *Manufacturer:* The party that manufactures, fabricates, or produces materials or products.

7. *Potable water:* Water that is safe and satisfactory for drinking and cooking.

8. *Purchaser:* The person, company, or organization that purchases any materials or work to be performed.

* United States Code, 732 North Capitol Street, NW, Washington, DC 20401-0001.

† US Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC 20460.

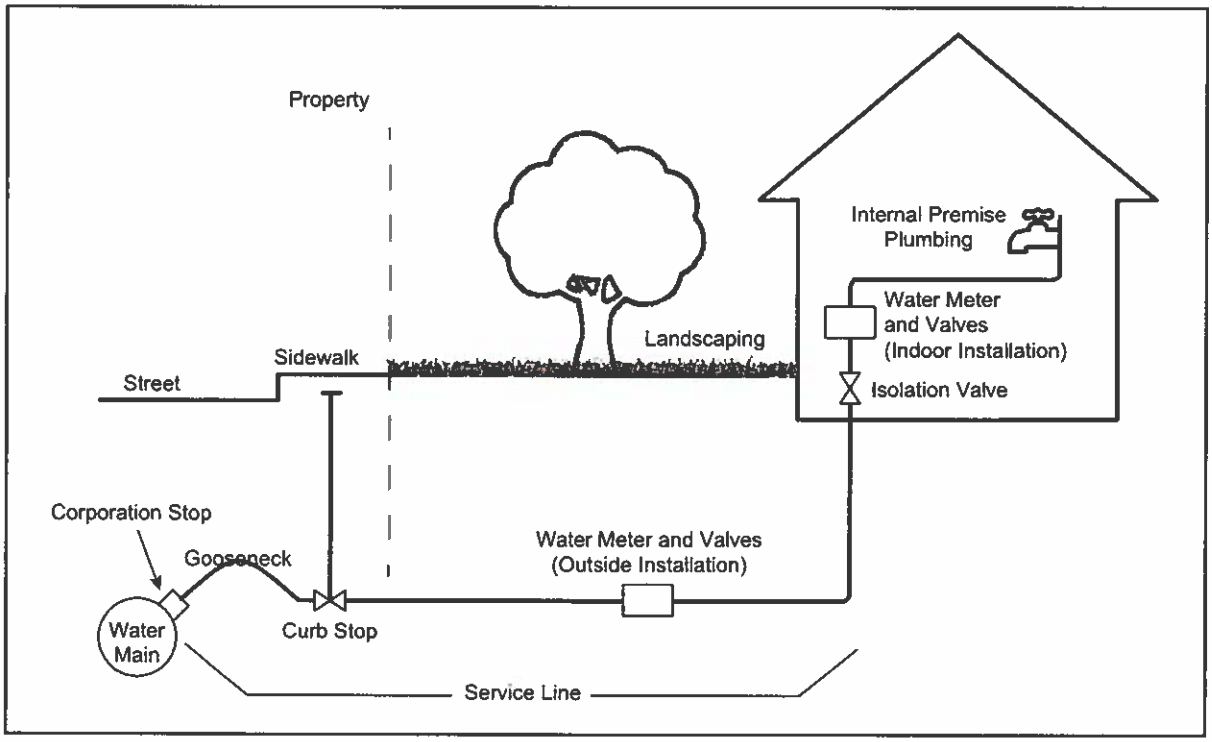

Figure 1 Typical water service line components

9. *Service line:* The pipe that runs between the utility's water main and the specific premises' plumbing, including both the portion owned by the utility, if any, and the private service line owned by the property owner (see Figure 1).

10. *Utility:* The organization or entity with the primary purpose of pro- viding a designated area with potable water service.

11. *Water main:* The water pipe from which the domestic water supply is delivered by the utility to the service pipe leading to specific premises (see Figure 1).

12. *Water meter:* An instrument used for recording the quantity of water passing through the service line to specific premises. Water meters are typically installed with valves on inlet and outlet sides of the meter (see Figure 1).

SECTION 4: REQUIREMENTS

Materials shall comply with the requirements of the Safe Drinking Water Act and other federal regulations for potable water systems as applicable.

Water can be naturally corrosive and often dissolves lead as a result of water's contact with the service line as well as other plumbing components. A number of sampling and analytical techniques are available for customers to determine the

level of lead in their drinking water. Some of these tests are collected and/or analyzed by the local water provider. Other tests may be conducted by the customers themselves but should be in compliance with sampling and analytical techniques accepted by the local utility. The data captured from the various tests can be used to assist the utility in adjusting the water chemistry by modifying the application of corrosion control chemicals.

Utility personnel should consider that the level of dissolved and particulate lead within the homes and/or businesses of their customers may be greater than the levels within their system based on the potential leaching from service lines and internal premise plumbing components. Lead service lines potentially represent the largest mass of lead in regular contact with potable water, hence the interest in removing lead service lines in their entirety. Utilities should also consider that lead levels may vary based on chemical and physical conditions, level of disturbance to the piping, sampling technique, and other factors when determining the number of samples to be collected. A single sample may not be adequate in determining how much lead is being released.

For planned lead service line replacements, the utility shall establish replacement agreements to be reviewed with and accepted by the customer before any work being accomplished. These agreements should detail the responsibilities of the customer as well as those of the utility and should be intended to reduce any ambiguity about what is to be accomplished and by whom. Any financial requirements essential to the completion of the project should also be identified.

Sec. 4.1 Location and Replacement of Lead Service Lines

The replacement of lead service lines can be generally accomplished by one of the following ways:

- Open cut full replacement—traditional technology with excavation on the full length of service line to be replaced.
- Trenchless replacement on new routes—methods such as directional drilling or pneumatic or hydraulic ramming tools (boring tools) to pull in the new service line on a new route (cutting and leaving the existing lead service in place and replacing it using a new service line).
- Trenchless replacement on existing routes—methods such as pipe split- ting and/or pulling the existing lead service that is being replaced with a new pipe using the existing service line route (pipe splitting leaves the existing lead service in the ground, pulling removes the existing lead service line).

4.1.1 *Locating lead service lines.* In order to replace the existing lead service line, the line must be appropriately identified and located. Some agencies have a database detailing the locations of their lead service lines. Such a record simplifies that portion of the replacement process. Other water providers do not have accurate records reflecting the locations of the lead assets. In this case, other means of identification shall be employed. It is highly recommended that utilities use more than one method of confirming the actual locations of the lead service lines. Utilities should record the service line material when observed during repairs, inspections, or other quality reports. Utilities should be aware that it is at times difficult to verify that a service line contains no portions made of lead, and that some degree of uncertainty may exist in a utility's inventory of lead service lines.

4.1.1.1 Identifying lead service lines at the meter, corporation stop, curb stop, or service box. Lead service lines can sometimes be identified at the main, curb stop, or meter box outside the house or adjacent to the meter inside the house. Typically, lead service lines have a distinctive "bulb-looking" section near the end at a brass, galvanized, compression, or other fitting that connects the service. The absence of the "bulb" section does not confirm the absence of lead. The observation of lead pipe in one location does not confirm the entire service line is lead. It is possible a portion of the lead service was previously replaced during repair or maintenance activity.

4.1.1.2 Using the scrape test to confirm the lead service line. Lead is a gray, nonmagnetic (a magnet will not stick to lead pipe), and relatively soft material com- pared with other pipe products. A coin scraped along the exterior of a lead pipe will create an indent and reveal a shiny-silver color. Care must be taken not to go too deep to avoid puncturing the pipe. Workers should use appropriate personal protective equipment, such as gloves and eye protection, to prevent exposure to lead. The scrape test identifies solid lead service lines. It will not identify lead-lined iron pipe.

4.1.1.3 Identifying lead service lines by water quality sampling. The concentration of lead found in the water sample can indicate if a lead service line is likely. A sample of the water from the service line should be taken to determine the level of lead. The line should be allowed to sit with no flow for at least 6 hours before sampling. Whether the water meter is inside the building, outside the building, or in an area that is unmetered, it is critical to flush a specific amount of water and then take a sample to be tested. The amount flushed prior to sampling should flush at least the volume of premise plumbing between the service line and the sampling tap. A single test may not be the most effective indicator of the existence of a lead service. The

minimum lead concentration will be system specific, and multiple samples may be required to ensure the lead is not from lead solder or other internal plumbing sources. A low or nondetect lead sample cannot be used to verify the absence of a lead service line. Utilities should use care in interpreting water samples collected at one point in time because of the variability of lead occurrence in samples.

4.1.1.4 Utilizing hydro-excavation to determine the presence of lead. The hydro-excavation process creates a small boring hole to expose the service line at a depth at the water main, the curb box, and/or the meter box, allowing visual observation to identify whether the service line (or a portion) is lead or not. Care should be taken to minimize any physical disturbances to the pipe.

4.1.1.5 Full test-pit excavation. Dig or excavate a large pit down to the service line to expose the pipe. This method could physically disturb the pipe.

4.1.1.6 Other lead service identification techniques. A number of other techniques are used or offered for consideration to locate the presence of lead service lines. When considering other techniques, the utility should make sure such techniques minimize any physical disturbances to the pipe.

4.1.2 *Preparation.* Before the replacement of the lead service line, a number of related preparatory activities shall take place.

4.1.2.1 Customer notification. The impacted customers shall be notified to identify the process established for replacement, whether full or partial. Most agencies have agreements to be signed by both parties reflecting the responsibilities relative to the replacement effort. The type of replacement, the schedule, and other pertinent items shall be covered appropriately with the customer before the replacement activity. The customer notification should include any post-replacement responsibilities, such as flushing or the use of filters, and should include directions to the customer to make the workspace ready and safe prior to the replacement activity. Customers should also be made aware of the risks of a partial replacement, where applicable (see Sec. 4.2).

4.1.2.2 Underground utility locates. The location of other underground utilities shall be done prior to the work to avoid utility strikes and is critical to the success of the lead service line replacement. Locates shall be scheduled in a timely manner without disruption to the established work plan.

4.1.2.3 Lead service replacement plan. A replacement plan shall be established for the work crews to reflect the schedule of the effort, the typical amount of time the customers will be impacted, and so on. This information shall be used to inform the customer of the coming replacement activity and communicated to the customer in a timely manner.

4.1.2.4 Water shutoff and service line isolation. Prior to beginning the replacement work, the water supply to the service line and the customer shall be shut off to avoid release of particulate lead into the customer's premises caused by vibration of the service during any excavation. The service line to be removed shall be isolated by shutting off appropriate valves at each end of the area to be removed.

4.1.3 *Open-cut full replacement of lead service lines.* The open-cut full replacement approach to lead service line removal involves the extraction of all the surface treatment and earth material above the level of the pipe. Care must be taken because other underground utilities, including the water main, may have not been properly located.

4.1.3.1 Proper equipment and material usage for open-cut full replacement. The excavation equipment used for the open-cut full replacement approach shall be sized to accommodate the full depth of the hole. Safety precautions shall be taken in consideration of the customer's property as well as any local pedestrian and/or vehicular traffic.

4.1.3.2 Use of adequate trench safety. Based on the depth of the excavation, an adequate level of trench safety shall be used to guarantee compliance with applicable requirements.

4.1.3.3 Lead service line removal. Once properly exposed and identified, the existing lead service line shall be disconnected from the main as well as the customer's side of the connection. When a utility elects to remove the lead pipe from the ground, the discarded lead line shall be carefully cut or bent into manageable sections and taken for processing for ultimate disposal. The amount of lead removed and the location of the removal along with any other pertinent information shall be documented. If the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.3.4 Connecting the new service line. The new pipe shall be measured and placed with enough material to properly connect to the main as well as to the customer's side. The new pipe material shall comply with the requirements of the Safe Drinking Water Act and other federal regulations for potable water systems as applicable. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.3.5 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the course of the excavation.

4.1.4 *Trenchless replacement on new routes.* The directional drilling or pneumatic/hydraulic installation methods of replacing lead service lines make use of a pilot hole that is created by drilling or pneumatically or hydraulically pushing a rod into the soil from an open access pit at the main to an access pit at the meter box or at an area adjacent to the wall where the new service will be connected on the customer's side. In a number of these installation scenarios, the existing lead pipe is disconnected on either end and left in place. When the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.4.1 Required access pits. Based on the length of the service to be replaced, access pits shall be excavated down to the depth of the main on one side and to the depth of the service connection on the customer's side. As with any excavation, utility locates shall be requested and received prior to the work being performed, and all applicable trench safety devices shall be used. If the distance between the access pits is great or other underground utilities that are a cause for concern exist, an intermediate access pit may be required.

4.1.4.2 Proper use of boring tools. The boring tool shall be placed in the launching access pit level and pointed in the direction of the receiving pit. The horizontal and vertical directions of the tool shall be monitored until it reaches the receiving pit. Proper service line installation depth is critical and must be maintained in accordance with local requirements.

4.1.4.3 Connecting the new service line. Once the boring tool reaches the receiving pit, the new service line shall be connected to the boring tool and pulled through the bore hole with enough length of the new service pipe material to add fittings to connect to the main as well as on the customer's side. When dis- similar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.4.4 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in the access pits in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the extent of the excavation.

4.1.5 *Trenchless replacement on existing routes.* The pipe-splitting method employs the use of a tool pulled through the existing lead service line that splits the pipe. The existing lead service line remains in the ground and a new service line is pulled into place. Another related method is to disconnect the lead service on each end and to connect a fitting to one side with an extraction device and to connect

the new pipe material on the other end in order to pull the new service into place, while removing the existing lead service line.

4.1.5.1 Required pipe- splitting and -pulling access pits. As in the directional drilling and pneumatic/hydraulic installation approaches, access pits shall be excavated to the depth of the main on one side and to the depth of the service connection on the customer's side. Other underground utility locates shall be obtained prior to the work, and all applicable trench safety devices shall be used.

4.1.5.2 Use of the splitting tool. Care must be taken to disconnect the existing lead service line and to cut it in a manner that facilitates pushing a cable through it with the splitting tool attached. The splitting tool is then used to displace the existing lead pipe and draws the new pipe material through it to the other end of the project. When the existing lead pipe is left in the ground, the impacted customer(s) should be made aware of the abandoned pipe.

4.1.5.3 Connecting the new service line. Once the splitting tool reaches the receiving access pit, the new service line shall be pulled through to allow enough material to adequately connect to both sides. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion (see Sec. II.E regarding grounding of electrical circuits on piping).

4.1.5.4 Backfill and surface restoration. Select bedding and/or a specified fill material, in conjunction with the identified surface treatment, shall be placed in the access pits in a manner consistent with all applicable requirements to reduce or eliminate the possibility of settling beyond the allowable amount along the extent of the excavation.

Sec. 4.2 Partial Replacements

4.2.1 *General.* It may not always be practical or possible to replace all of a lead service line at the same time. Coordination among the utility, the property owner, and constructor could result in situations in which partial replacement may be unavoidable. Although every effort shall be made to avoid partial replacements, it may be necessary to accommodate partial replacement situations as an interim measure. Partial replacement is not desirable because of the potential for increased release of lead into the water. This section describes additional requirements and recommendations for partial lead service line replacements.

4.2.2 *Existing conditions.* For services where partial replacements have previously occurred and a portion of the service still contains lead pipe, it is recommended that these locations be identified and re-evaluated for removal of the remaining material. For example, some utilities, property owners, or constructors,

through the course of routine maintenance and repairs, may have replaced portions of lead services with alternative materials without having replaced the remainder of the service either to the main or into the property.

4.2.3 *Delayed replacement.* Situations will occur in which a lead service line might not be fully replaced and a portion is left for later replacement. Coordination among all stakeholders during a lead service line replacement is critical. When it is necessary to complete a total lead service line replacement where both the utility and the property owner are responsible for portions of the work (i.e., up to the property line and beyond the property line), all parties should perform the work in close succession to minimize the potential for utilization of the service before completion of the total replacement. However, there may be instances in which one party completes its portion of the work in advance of the other party being available or willing. The scope of replacement may be large for some communities, and thus the time required to complete all the work may be long. In either of the delay cases presented below, the utility shall record that all portions of the service have successfully been replaced after notification of successful completion of full replacement. Communications regarding the effect of partial service line replacement should occur as covered in Sec. 4.3.

4.2.3.1 Property owner delay. On completion of the utility-owned portion of a lead service line replacement, the property owner should complete replacement of their portion as well. However, given the logistics of this work and the likely need for the property owner to hire an independent contractor, there may be a period during which the old and new portions of the service will be connected to allow for the continued supply of water but the lead replacement is only partially complete. During the interim period, the property owner shall be provided clear guidance regarding the increased risk of lead entering the water associated with the partial-replacement condition. Refer to Sec. 4.3 with respect to communication during this period.

4.2.3.2 Utility delay. If a property owner replaces a portion or all of the service line from the home to the property line, the utility should make every effort to obtain documentation of the replacement for its inventory. In most cases the utility will learn of the work after it is completed. If the property owner notifies the utility in advance, the utility should try to schedule a mutually convenient time to perform its portion. When this is not achievable, the property owner shall be provided with clear guidance regarding the increased risk of lead entering the water associated with the partial-replacement condition. Refer to Sec. 4.3 with respect to communication during this period.

4.2.4 *Partial replacement.* It is possible that a portion of the service may contain lead, be out of the utility's responsibility, and subsequently not be replaced. This circumstance may exist for a variety of reasons including cost, miscommunication, misunderstanding of the issues, ambivalence, or social defiance.

4.2.4.1 Property owner refusal. Given the potentially high cost associated with service line replacement and the challenges that may arise with performing the work, it is conceivable to anticipate that some property owners may elect to do nothing. When this condition occurs, the utility shall follow the recommendations presented herein for dielectric connection of dissimilar metals, flushing, and testing. Documentation of the refusal, or at a minimum documentation that a portion of lead material remains (including its location and quantity), will be important for the utility to maintain complete records of the lead service line replacement progress/program. The customer should receive all necessary information regarding future risk.

4.2.4.2 Incentive program verification. If financing or incentive pro- grams are available to property owners, utilities will need to be cautious about validating that property owner portions of lead services have been replaced, in their entirety or at all. A method for verifying work performed and recording completed work will be necessary.

4.2.4.3 Cutting of lead service lines. After customer notifications and utility locates have been accomplished, the specific location of the lead pipe to be cut shall be identified. The proper cutting tools shall be identified to reduce the amount of lead displaced from the cut. A cutting tool such as a pipe cutter or pipe shearing device that reduces lead particles and disturbance is preferred to other tools that use a sawing or other abrasive action. The necessary safety equipment shall be used, including safety glasses and/or goggles and safety gloves. Care shall be taken while cutting the lead pipe to reduce the amount of lead shards from traveling and/or accumulating in the remaining service line sections. The lead service line sections remaining shall be connected and secured to reduce or eliminate the possibility of water leakage. When dissimilar metals are to be connected, a dielectric fitting shall be used to prevent galvanic corrosion. The discarded lead service line shall be carefully cut or bent into manageable sections for processing for ultimate disposal. The replacement section should be a pipe material in compliance with all federal, state, and local requirements. The amount removed as well as specific locations of the remaining sections should be documented. The replaced service line shall be turned on and checked for leaks

in a manner that does not expose the customer's side to potential lead fragments. Flushing shall be accomplished in a manner consistent with Sec. 4.4.

Sec. 4.3 Communications and Instructions to Customers

4.3.1 *General.* It is important to inform all customers that may be affected by lead service line activities. The utility shall provide communication to customers regarding the following items:

1. Advanced notice of planned lead service line replacement projects (45 days prior is recommended).
2. Informational point-of-contact for the project.
3. Additional notice prior to actual planned work affecting service line (day prior).
4. On-site utility point-of-contact during construction.
5. Post construction instructions regarding customer flushing, use of a point- of-use (POU) filter or bottled water, water sampling, and testing to be completed.
6. Clear guidance regarding the increased risk of lead entering the water associated with a partial lead service line replacement condition (if a full-service line replacement was not completed). Customers with partial replacements should avoid consuming their water unless they are using a filter certified for lead removal or they should consume bottled water until sample results show that their lead levels are less than the regulatory guideline.

In addition to water shutoff and service-line-isolation actions (Sec. 4.1.2.4), customers should be advised not to use water during excavation and construction activities.

Additional guidance to utilities for completing these customer communications is available in the foreword of this standard and in the AWWA document *Communicating About Lead Service Lines: A Guide for Water Systems Addressing Service Line Repair and Replacement.*

Sec. 4.4 Flushing Service Lines after Full or Partial Replacement

4.4.1 *Flushing by the utility immediately after lead service replacement.* After all connections have been completed, flush the water from an outside connection (such as hose-bib or hose leading from the house side of the meter installation) to remove any particles in the service line and near point-of-entry. The flushing is best done, if possible and practical, before the meter is connected in the service using a "jumper" or straight pipe in place of the meter. The straight pipe will allow for a higher velocity flush and protects the meter from potential damage from lead pipe and other construction-related fragments. Flush at full velocity for at least

10 minutes. If the meter was replaced with a "jumper," it may be reconnected in the service after utility flushing. Following completion of flushing by the utility, the customer shall flush the interior premise plumbing as described in Sec. 4.4.2.

In situations where flushing by the utility is not performed, the customer should be notified with instructions to flush before using any water.

4.4.2 *Flushing by the customer after lead service replacement.* The customer should flush all interior premise plumbing the same day or before next water use following the replacement. Subsequent flushing by the customer should be done once every two weeks for three months or at other intervals based on monitoring results if available. Utilities may want to encourage best times to flush based on water demand and operations (for example, when neighbors' water usage is low, e.g., midmorning to dinner time or late at night). Customers shall be advised to not use hot water in the premise plumbing until initial flushing is completed to prevent sedimentation of lead particles in premise hot water tanks.

4.4.2.1 Suggested instructions for customers.

1. Find all the faucets that will drain, including the basement and all floors in your house.
2. Remove aerators and screens whenever possible, including the shower heads, from all faucets you plan to flush.
3. Include the laundry tubs, hose-bibs, bathtubs, and showers as flushing points.
4. After all the aerators are off, open the faucets in the basement or lowest floor in the house. Leave all faucets running at highest rate possible, using cold water.
5. After the faucets are all open in lowest floor, open the faucets on next highest floor of the house. Continue until faucets are open on all floors.
6. After all faucets are opened, leave the water running for at least 30 minutes.
7. After 30 minutes, turn off the first faucet you opened and continue to turn off other faucets in the same order you turned them on.
8. Clean aerators/screens at each faucet. You may need to replace screens/ aerators if too old or worn.

Utilities and customers may consider an optional approach by coordinating a targeted flush of a few faucets at a time before opening all the faucets for the whole house flush. The targeted flush would start with a pattern of opening all faucets in a single area or single floor and then moving to the next to increase the flow velocities, followed by the whole house flush described above, with all faucets open.

4.4.2.2 Additional daily miniflush. As a precaution, the customer should do a miniflush of premise plumbing by running tap water each morning or when the water sits in the pipe for at least 6 hours. Flush for 5 minutes to displace water that has been sitting in the pipes inside the house and in the service line. This could include taking a shower, running the dishwasher, flushing a toilet, collecting water for plants/garden, or running the faucet. The customer should do this before using any water for drinking, cooking, infant formula, and so on. Daily miniflushes should continue for six months or until lead sample results show the lead level is below the regulatory guideline. The customer should clean debris from aerators and screens once a month for six months. After six months, clean debris twice a year.

4.4.2.3 Sampling. Water sampling and testing, following replacement and flushing, shall be conducted per Sec. 5.2.

SECTION 5: VERIFICATION

Sec. 5.1 Documentation of Construction Activities

Documentation of construction activities for each service line work activity may support verification that the lead service line has been fully or partially replaced. The following information shall be documented and recorded:

- Picture of home with house number
- Picture of test pits and meter pit showing new pipe or pipe ends and old lead pipe if in same location
- Length and material type of new pipe installed
- Type of pipe material the new pipe is connected to inside home
- Method of installation (trenchless, hand-excavation, etc.)
- Length and location of any abandoned lead service line pipe left in the ground

Flushing time and location(s) (for example, an outside hose-bib) shall be recorded. Some homes may not have an outside hose-bib turned on or other situations may arise that do not allow for postflushing by the utility. These situations shall be documented in field reports along with any communication attempted with the customer.

Sec. 5.2 Water Testing Following Replacement

Testing the water following the replacement shall be done to determine if appreciable lead is still present in the drinking water. Lead may still exist inside

home plumbing (lead solder, redeposited lead in scale of plumbing, and brass components) and could be disturbed during service line work. Therefore, lead present in the water following a full replacement does not mean the lead service has not been replaced. This condition should be explained to the customer. Flushing recommendations described in Sec. 4.4 can help remove released particles.

5.2.1 *Testing initiation.* Testing the water shall commence at least one month after the replacement to allow for sufficient in-house flushing and a period of normal use of water to occur. Utilities may consider initiating testing within the one- month period if supported by performance data. When only a partial replacement is completed and the lead service line replacement was mandatory as part of compliance with the Lead and Copper Rule (LCR), testing shall be conducted within 72 hours after the completion of the partial replacement of the service line per the requirements of the LCR.

5.2.2 *Test samples.* Testing shall include first-draw and second-draw samples. First-draw sample shall be the initial draw from the tap when it is turned on. Second-draw sample shall be collected with the objective of collecting water that stagnated in the service line, generally the fourth to seventh liter depending on site-specific conditions. Utilities may be able to omit the second draw sample if supported by documentation that the construction activities completely removed the lead service line and by acceptable first-draw lead data. Samples shall be collected from a frequently used tap inside the home, preferably the kitchen tap as the residents' consumption would likely be from the kitchen tap. Samples shall also be collected with the aerator on. Samples should be collected at the maximum flow rate of the tap and should be collected in wide-mouth bottles.

5.2.3 *Profile sampling.* Lead levels higher than expected from full lead replacements may occur and the utility or homeowner could investigate further with profile sampling. A profile is a series of bottles filled continuously following the stagnation period. The trend of lead concentrations coupled with measurements of the inside plumbing and service line will show which portion of plumbing or service contributes the highest lead by the liter number.

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Dedicated to the world's most important resource, AWWA sets the standard for water knowledge, management, and informed public policy. AWWA members provide solutions to improve public health, protect the environment, strengthen the economy, and enhance our quality of life.

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APPENDIX E

REQUIRED STANDARD CONTRACT LANGUAGE: CLEAN WATER STATE REVOLVING FUND AND DRINKING WATER REVOLVING FUND

- Davis-Bacon/Prevailing Federal Wages, Including Labor Standards Provisions
- Disadvantaged Business Enterprise (DBE) Requirements*
- Debarment/Suspension Certification*
- American and Iron Steel Act

* Bidders should note these sections contain instructions regarding forms/information that must be completed/included with any submitted bid.

Rev. 3-2015

Davis-Bacon/Prevailing Federal Wage Rates

P.L. 111-88 requires compliance with the Davis Bacon Act and adherence to the current U.S. Department of Labor Wage Decision. Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Contract Documents (see Wage Decision included herein) must be paid on this project. The Wage Decision, including modifications, must be posted by the Contractor on the job site. A copy of the Federal Labor Standards Provisions is included and is hereby a part of this contract.

General Decision Number: MI190057 02/08/2019 MI57

Superseded General Decision Number: MI20180057

State: Michigan

Construction Type: Heavy

County: Genesee County in Michigan.

Heavy, Includes Water, Sewer Lines and Excavation (Excludes Hazardous Waste Removal; Coal, Oil, Gas, Duct and other similar Pipeline Construction)

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/04/2019
1	02/08/2019

CARP0706-017 06/01/2018

	Rates	Fringes
CARPENTER, Includes Form Work	$ 26.51	20.94

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* ELEC0948-009 05/27/2018

	Rates	Fringes
ELECTRICIAN	$ 36.82	22.78

ENGI0325-019 09/01/2018

POWER EQUIPMENT OPERATORS: Underground Construction (Including Sewer)

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 32.53	23.85
GROUP 2	$ 27.80	23.85
GROUP 3	$ 27.07	23.85
GROUP 4	$ 26.50	23.85

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backhoe/ Excavator, Boring Machine, Bulldozer, Crane, Grader/ Blade, Loader, Roller, Scraper, Trencher (over 8 ft. digging capacity)

GROUP 2: Trencher (8-ft digging capacity and smaller)

GROUP 3: Boom Truck (non-swinging, non- powered type boom)

GROUP 4: Broom/ Sweeper, Fork Truck, Tractor, Bobcat/ Skid Steer /Skid Loader

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ENGI0326-011 06/01/2018

EXCLUDES UNDERGROUND CONSTRUCTION

	Rates	Fringes
OPERATOR: Power Equipment		
Group 1	$ 38.68	23.85
Group 2	$ 35.38	23.85
Group 3	$ 32.73	23.85
Group 4	$ 31.02	23.85
Group 5	$ 31.02	23.85
Group 6	$ 25.16	23.85

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: $1.50 per hour above the group 1 rate.
Crane operator with main boom and jib 400' or longer: $3.00 per hour above the group 1 rate.

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

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane operator with main boom and jib 400', 300', or 220' or longer.

GROUP 2: Crane operator with main boom and jib 140' or

longer, tower crane, gantry crane, whirley derrick

GROUP 3: Backhoe/Excavator; Boring Machine; Bulldozer; Crane; Grader/Blade; Loader; Roller; Scraper; Tractor; Trencher

GROUP 4: Bobcat/Skid Loader; Broom/Sweeper; Fork Truck (over 20' lift)

GROUP 5: Boom truck (non-swinging)

GROUP 6: Fork Truck (20' lift and under for masonry work)

IRON0025-006 06/17/2018

	Rates	Fringes
IRONWORKER		
Reinforcing	$ 29.48	27.74
Structural	$ 35.52	28.65

LABO0334-009 06/01/2018

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
Landscape Laborer		
GROUP 1	$ 20.52	6.90
GROUP 2	$ 18.52	6.90

LANDSCAPE LABORER CLASSIFICATIONS

GROUP 1: Landscape specialist, including air, gas and diesel equipment operator, lawn sprinkler installer and skidsteer (or equivalent)

GROUP 2: Landscape laborer: small power tool operator, material mover, truck driver and lawn sprinkler installer tender

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LABO0334-015 09/01/2018

SCOPE OF WORK:
OPEN CUT CONSTRUCTION: Excavation of earth and sewer, utilities, and improvements, including underground piping/conduit (including inspection, cleaning, restoration, and relining)

	Rates	Fringes
LABORER		
(1) Common or General	$ 21.94	12.85
(2) Mason Tender-Cement/Concrete	$ 22.08	12.85

(4) Grade Checker	$ 22.25	12.85
(5) Pipelayer	$ 22.39	12.85
(7) Landscape	$ 16.84	12.85

LABO1075-010 06/01/2018

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
LABORER		
Common or General; Grade Checker; Mason Tender - Cement/Concrete; Pipelayer	$ 22.82	13.51

PAIN1052-003 06/01/2018

	Rates	Fringes
PAINTER		
Brush & Roler	$ 24.40	12.95
Spray	$ 25.75	12.95

PLAS0016-016 04/01/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 25.58	12.88

PLUM0370-006 06/01/2018

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 37.81	20.60

TEAM0007-006 06/01/2018

	Rates	Fringes
TRUCK DRIVER		
Dump Truck under 8 cu. yds.; Tractor Haul Truck	$ 26.40	.50 + a+b
Dump Truck, 8 cu. yds. and over	$ 26.50	.50 + a+b
Lowboy/Semi-Trailer Truck	$ 26.65	.50 + a+b

FOOTNOTE:
a. $446.70 per week.
b. $67.00 daily.

SUMI2010-055 11/09/2010

	Rates	Fringes
TRUCK DRIVER: Off the Road Truck	$ 20.82	3.69

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

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

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

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

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

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

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

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END OF GENERAL DECISION

29 CFR Part 5 - Labor Standards Provisions for Federally Assisted Projects

§ 5.5 Contract provisions and related matters.

(a) The Agency head shall cause or require the contracting officer to insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in Sec. 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, *Provided,* That such modifications are first approved by the Department of Labor):

(1) *Minimum wages.* (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the

contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) *Withholding.* The (write in name of Federal Agency or the Joan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) *Payrolls and basic records.* (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate

federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5'.5(a)(3)(i), except that full social security numbers

and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee *(e.g.,* the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at *http:l lwww.dol.gov/whdlformslwh347.pdf* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the

"Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor. sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment advance, or guarantee of funds. Furthermore, failure to submit the 'required records upon request or to make such records · available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) *Apprentices and trainees--(i) Apprentices.* Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship p Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the jobsite in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits,

apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) *Trainees.* Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) *Equal employment opportunity.* The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) *Compliance with Copeland Act requirements.* The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write

in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) *Contract termination: debarment.* A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) *Compliance with Davis-Bacon and Related Act requirements.* All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) *Disputes concerning labor standards.* Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) *Certification of eligibility.* (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person
or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis- Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(b) *Contract Work Hours and Safety Standards Act.* The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part'4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times

the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible there for shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) *Withholding for unpaid wages and liquidated damages.* The (write in the name of the Federal agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b) (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b) (1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec. 5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such

representatives to interview employees during working hours on the job.

Disadvantaged Business Enterprises (DBE)

Prime contractors bidding on this project must follow, document, and maintain documentation of their Good Faith Efforts, as listed below, to ensure that Disadvantaged Business Enterprises (DBEs) have the opportunity to participate in the project by increasing DBE awareness of procurement efforts and outreach. Bidders must make the following Good Faith Efforts for any work that will be subcontracted.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. Place DBEs on solicitation lists and solicit DBEs whenever they are potential sources.

2. Make information on forthcoming opportunities available to DBEs. Arrange time- frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. Whenever possible, post solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date. The DBEs should be given a minimum of 5 days to respond to the posting.

3. Consider in the contracting process whether firms competing for large contracts can be subcontracted with DBEs. Divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

4. Encourage contracting with a consortium of DBEs when a contract is too large for one DBE firm to handle individually.

5. Use the services and assistance of the Small Business Administration and the Minority Business Development Agency of the U.S. Department of Commerce.

Subsequent to compliance with the Good Faith Efforts, the following conditions also apply under the DBE requirements. Completed Good Faith Efforts Worksheets (Attachment 1), along with the required supporting documentation outlined in the instructions, must be submitted with your bid proposal. EPA form 6100-2 must also be provided at the pre-bid meeting. A copy of this form is available on the Forms and Guidance page of the Revolving Loan website.

1. The prime contractor must pay its subcontractor for work that has been satisfactorily completed no more than 30 days from the prime contractor's receipt of payment from the owner.

2. The prime contractor must notify the owner in writing prior to the termination of any DBE subcontractor for convenience by the prime contractor and employ the Good Faith Efforts if soliciting a replacement contractor.

3. If a DBE contractor fails to complete work under the subcontract for any reason, the prime contractor must employ the Good Faith Efforts if soliciting a replacement contractor.

4. The prime contractor must employ the Good Faith Efforts.

Debarment Certification

The prime contractor must provide a completed Certification Regarding Debarment, Suspension, and Other Responsibility Matters Form with its bid or proposal package to the owner (Attachment 2).

Attachment 1

Disadvantaged Business Enterprise (DBE) Utilization

GOOD FAITH EFFORTS WORKSHEET

Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance- Revolving Loan Section
Disadvantaged Business Enterprise (DBE) Utilization
State Revolving Fund/Drinking Water Revolving Fund
GOOD FAITH EFFORTS WORKSHEET

Bidder:_____

Subcontract Area of Work (one per worksheet:_____

Outreach Goal: Solicit a minimum of three (3) DBEs via email/letter/fax. It is recommended that various sources be used to locate the minimum number of DBEs. The Michigan Department of Transportation (MDOT) website and www.sam.gov registries may be two resources used to find a minimum of three DBEs.

List the DBEs contacted for the above area of work and complete the following information for each DBE.

Company Name	Type of Contact	Date of Contact	Price Quote **Received**	Accepted/ Rejected	Please Explain if Rejected
				☐A ☐R	
				☐A ☐D	
				☐A ☐R	
				☐A ☐R	
				☐A ☐R	
				☐A ☐R	

Explanation for Not Achieving a Minimum of Three Contacts; you may include a printout of the MDOT and www.sam.gov search results (attach extra sheets if necessary):

MITA DBE Posting Date (if applicable):_____
(attach a copy of the DBE advertisement)

Other Efforts (attach extra sheets if necessary):

Please include the completed worksheet and supporting documentation with the bid proposal.

Michigan Department of Environmental Quality
Office of Drinking Water and Municipal Assistance- Revolving Loan Section
Disadvantaged Business Enterprise (DBE) Utilization
State Revolving Fund/Drinking Water Revolving Fund
GOOD FAITH EFFORTS WORKSHEET

Instructions to Bidders for the Completion of the Good Faith Efforts Worksheet

1. Separate worksheets must be provided for each area of work to be subcontracted out. This includes both major and minor subcontracts.

2. A minimum of three (3) DBEs must be contacted by a verifiable means of communication such as e-mail, letter, or fax for each area of work to be subcontracted out. Copies of the solicitation letters/e-mails and fax confirmation sheets must be provided with the worksheet.

3. If less than three (3) DBEs exist statewide for the area of work, then provide documentation that other DBE resources were consulted. This may include the MOOT and www.sam.gov registries and an advertisement is a publication. A printout of the website searched (conducted prior to the end of the bid period) must be submitted.

4. Posting solicitations for quotes/proposals from DBEs on the MITA website (www.mitadbe.com) is highly recommended to facilitate participation in the competitive process whenever possible. The solicitation needs to identify the project and the areas of work to be subcontracted out. A copy of the MITA DBE advertisement must be submitted with the Good Faith Efforts worksheet, if used, or a printout of the resulting quotes posted to the MITA website can be submitted with this form as supporting documentation.

5. If the area of work is so specialized that no DBEs exist, then an explanation is required to support that conclusion, including the documentation required in No. 3 above.

6. The date of the DBE contact must be identified, as it is important to document that the DBE solicitation was made during the bid period and that sufficient time was given for the DBE to return a quote.

7. Each DBE firm's price quote must be identified if one was received or N/A entered on the worksheet if a quote was not received. Copies of all quotes must be submitted with the worksheet.

8. If a quote was received, indicate if it was accepted or rejected. Justification for not accepting a quote and not using the DBE subcontractor must be provided.

9. Under Other Efforts, please indicate additional steps you have taken to obtain DBE contractors and provide the appropriate supporting documentation such as:
   - Follow-up e-mails, faxes, or letters.
   - Copies of announcements/postings in newspapers, trade publications, or minority media that target DBE firms.

Rev. 3-2015

Attachment 2

Certification Regarding

Debarment, Suspension, and Other Responsibility Matters

Certification Regarding

Debarment, Suspension, and Other Responsibility Matters

The prospective participant certifies, to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in transactions under federal non-procurement programs by any federal department or agency;

(2) Have not, within the three year period preceding the proposal, had one or more public transactions (federal, state, or local) terminated for cause or default; and

(3) Are not presently indicted or otherwise criminally or civilly charged by a government entity (federal, state, or local) and have not, within the three year period preceding the proposal, been convicted of or had a civil judgment rendered against it:

(a) For the commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public transaction (federal, state, or local) or a procurement contract under such a public transaction;

(b) For the violation of federal or state antitrust statutes, including those proscribing price fixing between competitors, the allocation of customers between competitors, or bid rigging; or

(c) For the commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

I understand that a false statement on this certification may be grounds for the rejection of this proposal or the termination of the award. In addition, under 18 U.S.C. §1001, a false statement may result in a fine of up to $10,000 or imprisonment for up to five years, or both.

_____

Name and Title of Authorized Representative

_____

Name of Participant Agency or Firm

_____

Signature of Authorized Representative Date

☐ I am unable to certify to the above statement. Attached is my explanation.

Attachment 3

Frequently Asked Questions about Disadvantaged Business Enterprise (DBE) Solicitation

Disadvantaged Business Enterprise (DBE) Requirements
Frequently Asked Questions Regarding Contractor Compliance

Q: What is the Good Faith Efforts Worksheet form and how is it to be completed?

A: This form captures efforts by the prime contractor to solicit DBEs for each area of work type that will be subcontracted out. A separate Good Faith Efforts Worksheet must be provided by the prime contractor for each area of work type to be subcontracted out. There are specific instructions that accompany this form that prescribe minimum efforts which bidders must make in order to be in compliance with the DBE requirements.

Q: Can non-certified DBEs be used?

A: While non-certified DBEs can be used, only DBEs, MBEs, and WBEs that are certified by EPA, SBA, or MOOT (or by tribal, state and local governments, as long as their standards for certification meet or exceed the standards in EPA policy) can be counted toward the fair share goal. Proof of certification by one of these recognized and approved agencies should be sought from each DBE.

Q: How does a DBE get certified?

A: Applications for certification under MOOT can be found at http://mdotjboss.state.mi.us/UCP/LearnHowServlet.

Applications for certification under EPA can be found on EPA's Small Business Programs website at http://www.epa.gov/osbp/dbe_firm.htm under Certification Forms.

Q: If a bidder follows the MOOT DBE requirements, will the bidder be in compliance with the SRF/DWRF DBE requirements?

A: No. Federally funded highway projects utilize DBE goals, which require that a certain percentage of work be performed by DBE subcontractors. For SRF/DWRF projects there is no financial goal. However, there is a solicitation effort goal. Bidders must use Good Faith Efforts for each and every area of work to be subcontracted out to obtain DBEs. The bidders are not required to use DBEs if the quotes are higher than non-DBE subcontractors. **There is no required DBE participation percentage contract goal for the SRF/DWRF.** However, if the SRF/DWRF project is part of a joint project with MOOT, the project can be excluded from SRF/DWRF DBE requirements (i.e., the Good Faith Efforts Worksheet is not required) as it would be difficult to comply with both programs' requirements.

Q. Must the Good Faith Efforts Worksheet and supporting documentation be turned in with the bid proposals?

A: Yes. This is a requirement to document that the contractor has complied with the DBE requirements and the Good Faith Efforts. These compliance efforts must be done during the bidding phase and not after-the-fact. It is highly recommended that the need for these efforts and the submittal of the forms with

the bid proposals be emphasized at the pre-bid meetings. Failure to show that the Good Faith Efforts were complied with during the bidding process can lead to a prime contractor being found non-responsive.

Q: Does EPA form 6100-2 need to be provided at the pre-bid meeting?

A: Yes. The form must be made available at the pre-bid meeting.

Q: What kinds of documentation should a contractor provide to document solicitation efforts?

A: Documentation can include fax confirmation sheets, copies of solicitation letters/e-mails, printouts of online solicitations, printouts of online search results, affidavits of publication in newspapers, etc.

Q: How much time will compliance with the Good Faith Efforts require in terms of structuring an adequate bidding period?

A: Due to the extent of the efforts required, a minimum of 30 calendar days is recommended between bid posting and bid opening to ensure adequate time for contractors to locate certified DBEs and solicit quotes.

Q: How does a contractor locate certified DBEs?

A: The Michigan Department of Transportation has a directory of all Michigan certified entities located at http://mdotjboss.state.mi.us/UCP/. Additionally, the federal System for Award Management (SAM) is another place to search and can be found at www.sam.gov. SAM contains information from the former Central Contractor Registration (CCR) database.

Q: If the bidder does not intend to subcontract any work, what forms, if any, must be provided with the bid proposal?

A: The bidder should complete the Good Faith Efforts Worksheet with a notation that no subcontracting will be done. However, if the bidder is awarded the contract and then decides to subcontract work at any point, then the Good Faith Efforts must be made to solicit DBEs.

Q: In the perfect world, the Good Faith Efforts Worksheet is required to be turned in with the proposal. What if no forms are turned in with the bid proposal or forms are blank or incomplete? Should this be cause to determine that the bidder is non-responsive?

A: While the Good Faith Efforts Worksheet is important, it is more critical to confirm that the contractor complied with the DBE requirements prior to bid opening. The owner should contact the bidder as soon as deficiencies are noted for a determination/documentation of efforts taken to comply with the DBE requirements. Immediate submittal of the completed forms will be acceptable provided the Good Faith Efforts were made and it is just a matter of transferring information to the forms.

Q: If the prime contractor is a DBE, does he have to solicit DBE subcontractors?

A: Yes, the DBE requirements still apply if the prime intends to subcontract work out. Good Faith Efforts must be used to solicit DBEs.

Q: If the area of work is one where there are less than three DBE contractors, how is the contractor to document this?

A: Copies of printouts from MOOT and SAM showing no DBEs and advertisements soliciting quotes for all subcontract areas, including the questionable areas, will be adequate if the dates on the printouts are prior to the bid or proposal closing date.

American Iron and Steel Contract Language

The Contractor acknowledges to and for the benefit of the City of Flint ("Purchaser") and the Michigan Department of Environmental Quality (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the State Revolving Fund and/or the Drinking Water Revolving Fund and such law contains provisions commonly known as "American Iron and Steel (AIS);" that requires all iron and steel products used in the project be produced in the United States ("AIS Requirements") including iron and steel provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the AIS Requirements, (b) all iron and steel used in the project will be and/or have been produced in the United States in a manner that complies with the AIS Requirements, unless a waiver of the requirements is approved or the State made the determination in writing that the AIS Requirements do not apply to the project, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the AIS requirements, as may be requested by the Purchaser. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

CITY OF FLINT
FINANCE DEPARTMENT - DIVISION OF PURCHASES AND SUPPLIES

City Hall
1101 S. Saginaw Street, M203 – Flint, Michigan 48502
(810) 766-7340 FAX (810) 766-7240 www.cityofflint.com TDD 766-7120

Dr. Karen W. Weaver
Mayor

Bryan Bond
Interim Purchasing Manager

March 1, 2019

TO: All Proposers

FROM: Bryan D. Bond, Interim Purchasing Manager
Finance Department - Division Dept. Purchases & Supplies

SUBJECT: **Addendum #1 – Proposal #19000558 - "FAST Start Phase 6 (SLR) Service Line Replacements" – Due Thursday, March 7, 2019 @ 3:00 p.m. (EST)**

This addendum has been issued in response to clarify the requested services outlined currently in the RFP documents and to address questions raised in the mandatory pre-proposal meeting held on 2/11/19 @ 11:00 AM (EST) and those submitted in writing as of 5:00 PM (EST) 2/28/19.

1. It is my understanding that bidders price proposal will determine low to high bids based on the unit pricing spreadsheet form and quantities that the city has established for each. This total price can be in excess of 10 million dollars based on the past phase prices by contractors. How does this correlate to the bonding and contract price for a contractor who is going after (1) zone or approximately 500 addresses? As this is a unique bid opportunity some bonding companies are having trouble understanding and grasping what a contract amount would look like for a zone that could result in a simple exploration or a full replacement. Please elaborate on how a specific contractor's potential contract amount is calculated and what is expected for the bonding amount. You will bid on unit prices in response to the items requiring a bid. You will then determine how many "zones" or 500 address packets your company is able to complete. Bonding will only be required in the amount for the amount of work/zones you are awarded, not the entire project amount. The contractor should expect to bond the full amount of the zone, so plan on all addresses to be a service line replacement and plan on 500 addresses per zone. This methodology has allowed small local businesses the ability to bond portions of the project.

2. Does SLR.1 – SLR.12 line items for replacement include the exploration/excavation EXP.1 or would that address be billed for the EXP.1 AND SLR line items? Every address starts out as an exploratory excavation or SLE. In the event the line is excavated and a non-copper service line material is discovered that address then turns into a service line replacement or SLR. In this case you will only bill for an SLR. In the event the excavation is performed and a copper line is discovered you will only bill for an SLE.

3. Is line item M.5 for traffic controlled supplied by the city a "DEDUCT" from our proposal and contract? Traffic control will not be provided by the City of Flint. Traffic control will be arranged by the contractor.

4. Is line item M.3 for Sanitary Lateral Repair to include full removal and replacement of existing lateral from house to main? Or is this to be a spot repair as needed and I am assuming confirmed from our camera inspection on this contract? It's going to be a spot repair in the event the line is damaged from excavation. You must have video proof the line was intact prior to excavation in order to get paid.

5. Please confirm from the Pre-bid meeting that it is not the intent of the city to execute the liquidated damages unless "gross negligence and underperformance has been noted" during the contract. The goal of the COF is never to have to execute liquidated damages unless absolutely necessary. The definition of gross negligence or underperformance is to be determined by the City of Flint.

6. Were any liquidated damages handed out to current contract holders, including ones who are currently working to date on that contract? We have not assessed liquidated damages to any contractor to date.

7. Is backfill of existing excavated material permitted on private side excavations or are we mandated to remove all spoils here and backfill with Class II sand per the detail in the solicitation? We are allowing excavation spoils to be used as backfill in the greenbelt. Class II sand is required as backfill under the road. In either case it is important to achieve proper compaction. The contractor is responsible for backfilled excavations where settlement occurs because of incomplete compaction. In the event the contractor does not believe they can achieve proper compaction using excavation spoils the contractor should use class II fill sand per the spec.

8. Section 33 10 00 3.7. D. 17 states that pipe penetrations shall be sealed on both the inside and outside of the basement wall. This will require an excavation to be made outside the foundation wall to seal from the outside. Is expanding foam and non-shrink grout being applied from the inside of the basement wall sufficient for sealing the wall penetration? Yes

9. Will the contractor be required to cover the cost of permits? **No**

➢ ***All prime contractors must give evidence of engaging at minimum three (3) per category (DBE) Disadvantage Business Enterprises employment sources via documentation and provide the EPA Form 6100-2 (DBE Subcontractor Participation Form) document attached for each subcontractor utilized on this project whether a company, firm, joint venture, or individual. Proof of said searches and documentation should be provided as part of this RFP.***

ALL EXCAVATION SERVICE TYPES WILL REQUIRE A LATERAL SANITARY SEWER LINE INSPECTION

PLEASE USE REVISED ATTACHED PAGES 26 AND 27 FOR PRICING REPSPONSE TO THE RFP

Thank you.

Bryan D. Bond

Bryan D. Bond
Finance Department - Division of Purchases and Supplies

attachments; EPA FORM 6100-2 (DBE Subcontractor Participation Form)
REVISED PAGES 26 and 27