

**ADDENDUM NO. 2  
FOR  
ALKALI SEWER REHABILITATION**

**DOWNRIVER UTILITY WASTEWATER AUTHORITY  
WYANDOTTE, MICHIGAN**

**ADDENDUM ISSUE DATE: MAY 21, 2020**

**INTENT:**

This Addendum is issued prior to receipt of Bids to provide for certain changes to the Specifications and the Plans, as herein specified, and is hereby made a part of the Contract Documents and shall take into consideration in preparing the Bid. All other conditions remain the same.

The Bidder shall acknowledge the receipt of this Addendum on the Proposal, where indicated.

The following items constitute the Addendum and are described in detail.

**CLARIFICATIONS:**

The following questions were received, and answers are provided herein:

1. What is the anticipated Notice to Proceed (NTP) date?  
Answer: See Key Dates section of the Pre-Bid Meeting Notes which were issued with Addendum No. 1.
2. Could the owner/engineer please clarify when was the last time sewers were cleaned and televised?  
Answer: The date of the last sewer cleaning is unknown. The sewer was inspected in fall of 2018 and links to the CCTV videos were provided in Addendum No. 1.
3. Are CCTV available to review? If so, Who performs it in the past ? Could the owner/engineer please share it?  
Answer: See answer to question #2.
4. Will the owner be providing a water meter for the contractor to utilize free of charge for this project?  
Answer: Refer to Section 02990 Permits, Paragraph B.3
5. What is the average daily flow for the entire system in gallons per day, or gallons per minute?  
Answer: Dry weather flow information is provided on Drawing C-3 Temporary Dry Weather Flow By-Pass Plan.
6. Are there an acceptable hold time for this system? If so, how long approximately?  
Answer: The contractor is responsible for calculation of hold time and coordination of dry weather bypass within the parameters provided in the plans and specifications.
7. In an effort to provide adequate time for a site visit, would the owner / engineer consider pushing the bid due date one week?  
Answer: No, the bid due date will not be extended.

**Bloomfield Hills**  
555 Hulet Drive  
Bloomfield Hills, MI 48302  
248-454-6300

**Delhi Township**  
2101 Aurelius Rd.  
Suite 2A  
Holt, MI 48842  
517-694-7760

**Grand Rapids**  
1925 Breton Road SE  
Suite 100  
Grand Rapids, MI 49506  
616-454-4286

**Howell**  
105 W. Grand River  
Howell, MI 48843  
517-552-9199

**Jackson**  
401 S. Mechanic St.  
Suite B  
Jackson, MI 49201  
517-292-1295

**Kalamazoo**  
834 King Highway  
Suite 107  
Kalamazoo, MI 49001  
269-665-2005

**Lansing**  
215 S. Washington  
SQ  
Suite D  
Lansing, MI 48933  
517-292-1488

8. Can pay items for Chemical and Cementitious grouting be added to deal with infiltration?  
Answer: Additional pay items are being added as part of this addendum.
9. Can removal of loose bricks or hand chipping poor substrate be added as a pay item?  
Answer: Additional pay items are being added as part of the addendum.
10. Can the Video of the existing sewer be shared?  
Answer: Links to the CCTV videos were provided in Addendum No. 1.

**CHANGES in the SPECIFICATIONS BOOK:**

**Section 00300 Proposal (Issued)**

Replace Section 00300 Spin Cast Geopolymer Pipe in its entirety with the new section issued with this addendum.

**Section 00470 WIFIA Requirements (Issued)**

Replace Section 00470 WIFIA Requirements in its entirety with the new section issued with this addendum.

**Section 02707 Spin Cast Geopolymer Pipe (Issued)**

Replace Section 02707 Spin Cast Geopolymer Pipe in its entirety with the new section issued with this addendum.

**End of Addendum No. 2**

PROPOSAL  
FOR  
ALKALI SEWER REHABILITATION  
DOWNRIVER UTILITY WASTEWATER AUTHORITY  
WAYNE COUNTY, MICHIGAN

Downriver Utility Wastewater Authority  
25605 Northline Road  
Taylor, Michigan 48180

Bids Due: May 29, 2020  
On or Before: 2:00 pm, Local Time  
HRC Job No. 20191063

c/o DUWA System Manager  
OHM Advisors  
34000 Plymouth Road  
Livonia, Michigan 48150



To Prospective Bidders:

Name of Bidder: \_\_\_\_\_

Address: \_\_\_\_\_

Date: \_\_\_\_\_ Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

The above, as Bidder, hereby declares this bid is made in good faith without fraud or collusion with any persons bidding, and that the Drawings, Specifications, and all other information referenced in the Instructions to Bidders have been examined. Further, the Bidder is familiar with the location of the work described herein and is fully informed as to the nature of the work and the conditions relating to the performance of the Contract.

The Bidder acknowledges that no representations or warranties of any nature whatsoever have been received, or are relied upon from the Downriver Utility Wastewater Authority, its agents or employees, as to any conditions to be encountered in accomplishing the work and that the bid is based solely upon the Bidder's own independent judgment.

The above, as Bidder, hereby certifies that the Drawings, Specifications, and other data provided by the Owner for bidding purposes have been examined. Further, the undersigned certifies that the proposed construction methods have been reviewed and found acceptable for the conditions which can be anticipated from the information provided for bidding.

The Bidder hereby affirms that the site of work has been inspected and further declares that no charges in addition to the Individual Unit Prices shall be made on account of any job circumstances or field conditions which were present and/or ascertainable prior to the bidding. In addition, The Contractor, as such and as Bidder, shall make the determination as to existing soil conditions and shall also complete the work under whatever conditions created by the Contractor/Bidder's sequence of construction, construction methods, or other conditions the Contractor/Bidder may create, at no additional cost to the Owner.

The above, as Bidder, confirms knowledge of the location of the proposed Alkali Sewer Rehabilitation Project and appurtenant construction in the City of Wyandotte, Wayne County, Michigan, and the conditions under

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which it must be constructed; and also declares to have carefully examined the Drawings, Specifications, and Contract Documents which the Bidder understands and accepts as sufficient for the purpose of constructing said Alkali Sewer Rehabilitation Project, and appurtenant work, and agrees to contract with the Downriver Utility Wastewater Authority to furnish all labor, materials, tools, equipment, facilities and supervision necessary to do all the work specified and prescribed for the completion of the Alkali Sewer Rehabilitation, in strict accordance with the General Conditions, and with the full intent of the Drawings and Specifications, prepared by Hubbell, Roth & Clark, Consulting Engineers, and will accept in full payment therefore the sum of:

**BASE BID**

<u>Item</u>	<u>Quantity</u>	<u>Unit Price</u>	<u>Total Cost</u>
1. Pavt Rem, Special	111 Syd	@ \$ _____ = \$ _____	
2. Temporary Bypass Pumping System, Furnish		@ Lump Sum = \$ _____	
3. Temporary Bypass Pumping System, Rental	2 Month	@ \$ _____ = \$ _____	
4. Temporary Bypass Pumping System, Operate _____ Day		@ \$ _____ = \$ _____	
5. Temporary Bypass Pumping System, Remove		@ \$ _____ = \$ _____	
6. Gate Chamber		@ Lump Sum = \$ _____	
7. Modify MH C4-18		@ Lump Sum = \$ _____	
8. Sewer Cleaning, 60-inch Diameter	1,118 Ft	@ \$ _____ = \$ _____	
9. Cleaning Debris Disposal, Type II Landfill	128 Cyd	@ \$ _____ = \$ _____	
10. Spin-Cast Geopolymer Lining, Sewer, 60 inch	460 Ft	@ \$ _____ = \$ _____	
11. Spin-Cast Geopolymer Lining, Mh, 48 inch	66 Ft	@ \$ _____ = \$ _____	
12. Sewer Vent	1 Ea	@ \$ _____ = \$ _____	
13. Conc Pavt, Nonreinf, 9 inch, Special	101 Syd	@ \$ _____ = \$ _____	
14. Curb, Conc, Integral	60 Ft	@ \$ _____ = \$ _____	
15. Dr Structure Cover, Type B	1 Ea	@ \$ _____ = \$ _____	
16. Maintenance of Traffic		@ Lump Sum = \$ _____	
17. Topsoil, Seed & Mulch	90 Syd	@ \$ _____ = \$ _____	
18. Project Cleanup		@ Lump Sum = \$ _____	
19. Mobilization (5% Max.)		@ Lump Sum = \$ _____	
20. Audio Video Survey		@ Lump Sum = \$ _____	
21. Chemical Grout	200 Gal	@ \$ _____ = \$ _____	
22. Neat Ash Cement Grout	270 Cft	@ \$ _____ = \$ _____	
23. Mechanical Cleaning/Chipping	1,200 Sft	@ \$ _____ = \$ _____	

**Total Amount of Bid (numerically) \$ \_\_\_\_\_**

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**Total Amount of Bid** (in words) \_\_\_\_\_  
\_\_\_\_\_ U.S. dollars

The Owner, at its sole discretion, reserves the right to award to the Bidder who, in the sole determination of the Owner, will best serve the interest of the Owner. The Owner reserves the right to accept any bid, to reject any or all bids, to waive any and all informalities involving price, time, or changes in the work, and to negotiate contract terms with the successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional bids. However, it is the intention of the Owner to award to the low total bid to one bidder. Also, the Owner reserves the right to reject the bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the bid is not responsive or the Bidder is unqualified, of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Owner.

**Each bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.**

Each Proposal must be accompanied by a bid deposit in the form of a certified check, cashier's check or bid bond, executed by the bidder and Surety Company, payable to the Downriver Utility Wastewater Authority in the amount of Five Percent (5%) of the amount of the Proposal. See Instructions to Bidders – Bid Deposit for more information.

**TAXES**

The Bidder affirms that all applicable Federal, State and Local taxes of whatever character and description are included in all prices stated in this Form of Proposal.

**ADDENDA**

The Bidder acknowledges the following Addenda, covering revisions to the drawings or specifications and the cost, if any, of such revision has been included in the quoted proposal:

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_  
Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_  
Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_  
Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

**FEES**

The Bidder shall refer to the General Conditions for allowable Fees for additional work performed, upon Owner's written authorization, by Bidder's own forces and/or for additional work, upon Owner's written authorization, by Bidder's subcontractors.

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**TIME OF COMPLETION**

The Bidder hereby agrees to furnish the required Bonds, Insurance Certificates, and Policies within ten (10) days after acceptance of this Proposal and shall proceed at a rate to substantially complete the project within 150 calendar days after the Notice to Proceed. Substantial Completion is defined that the facility is ready to use for its intended purpose with all utility systems fully functional.

Final Completion with all clean-up and punch-list items shall be complete by within 60 days of the established Substantial Completion date.

The execution of all work and specific constraints as described in the contract drawings and specifications, must be strictly adhered to.

**LIQUIDATED DAMAGES**

Time is of the essence for completion of this project in order to have the Project ready for the OWNER. The Bidder guarantees that the work will be completed within the time limit stated herein before or within the time as extended as provided elsewhere in the Specifications. Inasmuch as the damage and loss to the Owner which will result from the failure of the Bidder to complete the work within the stipulated time, will be most difficult or impossible to accurately determine, it is mutually agreed that the damages to the Owner for such delay and failure on the part of the Bidder shall be liquidated in the amount of \$1,250.00 for each and every calendar day by which the Bidder shall fail to complete the work or any part thereof within the provisions hereof, and such liquidated damages shall not be considered as a penalty.

The Owner will deduct and retain out of any money due or to become due hereunder the amount of the liquidated damages, and in case those amounts are less than the amount of actual liquidated damages, the Bidder shall pay the difference upon demand of the Owner.

We understand that liquidated damages may be assessed should we fail to meet the stipulated completion dates. Specifically, liquidated damages will be assessed daily beginning 150 days after the Notice to Proceed until such a time that Substantial Completion is achieved and further if all work is not completed within the stipulated Final Completion period.

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**BIDS TO REMAIN FIRM**

The price stated in this Proposal shall be guaranteed for a period of not less than 180days from the bid due date and if authorized to proceed within that period, the bidder agrees to complete the work covered by the Proposal at said price.

If this Proposal is accepted by the Owner and the undersigned shall fail to contract as aforesaid and to furnish the required surety bonds within fifteen (15) days after being notified of the acceptance of their bid, then the undersigned shall be considered to have abandoned the contract, and the Certified Check, Cashier's Check or Bid Bond accompanying this Proposal shall be forfeited to the Downriver Utility Wastewater Authority.

If the undersigned enters into the contract in accordance with their proposal, or if their proposal is not accepted, then the accompanying bid guarantee shall be returned to the undersigned.

Company Name: \_\_\_\_\_

Signature: \_\_\_\_\_ Title: \_\_\_\_\_

Address: \_\_\_\_\_

County: \_\_\_\_\_ State: \_\_\_\_\_

Telephone No.: \_\_\_\_\_ Fax No.: \_\_\_\_\_

Email Address: \_\_\_\_\_

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**LEGAL STATUS OF BIDDER**

This Bid is submittal in the name of:

(Print) \_\_\_\_\_

The undersigned hereby designates below the business address to which all notices, directions or other communications may be served or mailed:

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip Code \_\_\_\_\_

The undersigned hereby declares the legal status checked below:

- INDIVIDUAL
- INDIVIDUAL DOING BUSINESS UNDER AN ASSUMED NAME  
The Assumed Name of the Co-Partnership is registered in the County of \_\_\_\_\_, Michigan
- CORPORATION INCORPORATED UNDER THE LAWS OF THE STATE OF \_\_\_\_\_  
\_\_\_\_\_. The Corporation is
- LICENSED TO DO BUSINESS IN MICHIGAN
- NOT NOW LICENSED TO DO BUSINESS IN MICHIGAN

The name, titles, and home addresses of all persons who are officers or partners in the organization are as follows:

A corporation duly organized and doing business under the laws of the State of \_\_\_\_\_

NAME AND TITLE	HOME ADDRESS
_____	_____
_____	_____
_____	_____

Signed and Sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
By (Signature)

\_\_\_\_\_  
Printed Name of Signer

\_\_\_\_\_  
Title



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**BID BOND**

We, the undersigned, \_\_\_\_\_

As Principal, hereinafter called the Principal, and \_\_\_\_\_

A corporation duly organized under the laws of the State of \_\_\_\_\_

As surety, hereinafter called the SURETY, are held and firmly bound unto:

The Owner: \_\_\_\_\_

in the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_),

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for \_\_\_\_\_

NOW, THEREFORE, if the OWNER shall accept the bid of the Principal and the Principal shall enter into a contract with the OWNER in accordance with the terms of such bid, and give such bond or bonds as may be specified in the CONTRACT DOCUMENTS with good and sufficient surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such contract and give such bond or bonds, if the Principal shall pay to the OWNER the difference not to exceed the penalty hereof 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 the obligation of the Principal shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_

\_\_\_\_\_

(Witness)

(Principal)

(Seal)

(Title)

(Witness)

(Surety)

(Title)

**END OF SECTION**

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### **Water Infrastructure Finance and Innovation Act**

The project will be financed using federal assistance under the Water Infrastructure Finance and Innovation Act (WIFIA). The following requirements are applicable to this contract. The Contractor is required to provide all records, documentation and certification to meet said requirements.

#### **I. Debarment and Suspension, Executive Order 12549, 51 FR 6370, February 21, 1986**

Contractor certifies that it will not knowingly enter into a contract with anyone who is ineligible under the 2 CFR part 180 and part 1532 to participate in the Project. Suspension and debarment information can be accessed at <http://www.sam.gov>. Contractor represents and warrants that it has or will include a term or conditions requiring compliance with this provision in all of its subcontracts under this Agreement.

Contractor shall comply with additional requirements regarding Debarment, Suspension, and Other Responsibility Matters as outlined in Section 00460.

#### **II. New Restrictions on Lobbying, 31 USC 1352**

FEDERAL LOBBYING RESTRICTIONS. Recipients of federal financial assistance may not pay any person for influencing or attempting to influence any officer or employee of a federal agency, a member of Congress, an officer or employee of Congress, or an employee of a member of Congress with respect to the award, continuation, renewal, amendment, or modification of a federal grant, loan, or contract. These requirements are implemented for USEPA in 40 CFR Part 34, which also describes types of activities, such as legislative liaison activities and professional and technical services, which are not subject to this prohibition. Upon award of this contract, Contractor shall complete and submit to the City the certification and disclosure forms in Appendix A and Appendix B to 40 CFR Part 34. Contractor shall also require all subcontractors and suppliers of any tier awarded a subcontract over \$100,000 to similarly complete and submit the certification and disclosure forms pursuant to the process set forth in 40 CFR 34.110.

#### **III. Civil Rights, Nondiscrimination, EEO Authorities**

##### General Introductory Language

CIVIL RIGHTS OBLIGATIONS. Contractor shall comply with the following federal non-discrimination requirements:

- a. Title VI of the Civil Rights Act of 1964, which prohibits discrimination based on race, color, and national origin, including limited English proficiency (LEP).
- b. Section 504 of the Rehabilitation Act of 1973, which prohibits discrimination against persons with disabilities.
- c. The Age Discrimination Act of 1975, which prohibits age discrimination.

- d. Section 13 of the Federal Water Pollution Control Act Amendments of 1972, which prohibits discrimination on the basis of sex.
- e. 40 CFR Part 7, as it relates to the foregoing.
- f. Executive Order No. 11246

Title VI of the Civil Rights Act of 1964, 42 USC 2000d et seq

Incorporated by reference in introductory language only. No additional language.

Section 504 of the Rehabilitation Act, 29 USC 794, supplemented by EO 11914, 41 FR 17871, April 29, 1976 and 11250, 30 FR 13003, October 13, 1965

Incorporated by reference in introductory language only. No additional language.

Age Discrimination Act, 42 USC 6101 et seq

Incorporated by reference in introductory language only. No additional language.

40 CFR Part 7

Incorporated by reference in introductory language only. No additional language.

Equal Employment Opportunity, EO 11246, 30 FR 12319, September 28, 1965

*Equal Employment Opportunity Obligations Under EO 11246:*

The Contractor shall comply with Executive Order 11246, entitled 'Equal Employment Opportunity,' as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

Contractor's compliance with Executive order 11246 shall be based on implementation of the Equal Opportunity Clause, and specific affirmative active obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4.

During the performance of this contract, the contractor agrees as follows:

- 1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including

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- apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.
- 2) The contractor will, in all solicitations or advancements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
  - 3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
  - 4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
  - 5) The contractor will comply with all provisions of Executive Order No. 11246 of Sept. 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
  - 6) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
  - 7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of Sept. 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
  - 8) The contractor will include the provisions of paragraphs (1) through (8) in every subcontract or

purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the contractor may request the United States to enter into such litigation to protect the interests of the United States. [Sec. 202 amended by EO 11375 of Oct. 13, 1967, 32 FR 14303, 3 CFR, 1966–1970 Comp., p. 684, EO 12086 of Oct. 5, 1978, 43 FR 46501, 3 CFR, 1978 Comp., p. 230, EO 13665 of April 8, 2014, 79 FR 20749, EO 13672 of July 21, 2014, 79 FR 42971]

*Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246) located at 41 CFR 60-4.3:*

- 1) As used in these specifications:
  - a) “Covered area” means the geographical area described in the solicitation from which this contract resulted;
  - b) “Director” means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
  - c) “Employer identification number” means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
  - d) “Minority” includes:
    - i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
    - iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
- 2) Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this

contract resulted.

- 3) If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
- 4) The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.
- 5) Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
- 6) In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
- 7) The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

- a) Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
- b) Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c) Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.
- d) Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e) Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f) Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g) Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items

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with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

- h) Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
- i) Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
- j) Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work force.
- k) Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR part 60-3.
- l) Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m) Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n) Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o) Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p) Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8) Contractors are encouraged to participate in voluntary associations which assist in fulfilling one

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or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

- 9) A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
- 10) The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, sexual orientation, gender identity, or national origin.
- 11) The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
- 12) The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
- 13) The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
- 14) The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at

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least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15) Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

*Segregated Facilities, 41 CFR 60-1.8*

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, sexual orientation, gender identity, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensuring that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. This obligation extends to all contracts containing the equal opportunity clause regardless of the amount of the contract. The term "facilities," as used in this section, means waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, wash rooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees; Provided, That separate or single-user restrooms and necessary dressing or sleeping areas shall be provided to assure privacy between the sexes.

*Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246) located at 41 CFR § 60-4.2:*

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

<b>Time-tables</b>	<b>Goals for minority participation for each trade</b>	<b>Goals for female participation in each trade</b>
2020	17.7 <sup>1</sup>	6.9% <sup>2</sup>

<sup>1</sup> Goals can be found at: [https://www.dol.gov/ofccp/TAguides/TAC\\_FedContractors\\_JRF\\_QA\\_508c.pdf](https://www.dol.gov/ofccp/TAguides/TAC_FedContractors_JRF_QA_508c.pdf)

<sup>2</sup> Nationwide goal for all covered areas

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

Participation by Disadvantaged Business Enterprises in Procurement under EPA Financial Assistance Agreements, 73 FR 15904

The WIFIA Program requires borrowers of WIFIA loans to incorporate EPA's six good faith efforts during contract and subcontract procurement and maintain documentation of such efforts. EPA's good faith efforts are explained in the DBE rule and website at: <https://www.epa.gov/resources-small-businesses/disadvantaged-business-enterprise-program-resources>. Contractor shall comply with the requirements of Section 00460 DBE and Debarment Certification.

**IV. American Iron and Steel Requirement**

The Contractor acknowledges to and for the benefit of \_\_\_\_\_ ("Purchaser") and the United States Environmental Protection Agency ("EPA") that it understands the goods and services under this Agreement are being funded with monies made available by the Water Infrastructure Finance and

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Innovation Act program of the EPA that has statutory requirements commonly known as “American Iron and Steel” that requires all of the iron and steel products used in the project to be produced in the United States (“American Iron and Steel Requirement”) including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents, warrants and covenants to and for the benefit of the Purchaser and the EPA that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, 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 American Iron and Steel Requirement, as may be requested by the Purchaser or the EPA. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or the EPA to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney’s fees) incurred by the Purchaser or the EPA resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the EPA or any damages owed to the EPA by the Purchaser). While the Contractor has no direct contractual privity with the EPA, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the EPA 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 EPA.

**V. Compliance with Davis Bacon and Related Acts**

(a) 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 29 C.F.R. § 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 § 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 WIFIA assistance recipient, [name of WIFIA borrower], on behalf of the U.S. Environmental Protection Agency (EPA), 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 WIFIA assistance recipient 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

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(if known), or their representatives, and the WIFIA assistance recipient 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 to the Administrator of the Wage and Hour Division (WHD Administrator), U.S. Department of Labor, Washington, DC 20210. The WHD Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient 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 WIFIA assistance recipient do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the WIFIA assistance recipient shall refer the questions, including the views of all interested parties and the recommendation of the WIFIA assistance recipient, to the WHD Administrator for determination. The WHD Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the WIFIA assistance recipient or will notify the WIFIA assistance recipient 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. [name of WIFIA borrower], shall upon written request of the WIFIA Director or 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 WIFIA Director 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) {no text here}

(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to [name of WIFIA borrower] . The payrolls

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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://www.dol.gov/esa/whd/forms/wh347instr.htm> 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 [name of WIFIA borrower], for transmission to the EPA, 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 [name of WIFIA borrower]).

(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 § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 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 [name of the borrower, EPA, 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 EPA may, after written notice to the [name of WIFIA borrower], 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 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 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. 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

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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 WHD 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 WHD Administrator 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 EPA 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 [name of WIFIA borrower], EPA, 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 following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section shall be inserted 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 § 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 therefor 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 \$25 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 [name of WIFIA borrower] shall upon its own action or upon written request of an authorized representative of the Department of Labor, or the EPA, 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 § 5.1, 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 EPA shall cause or require the [name of WIFIA borrower] 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 [name of WIFIA borrower], EPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

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"General Decision Number: MI20200075 05/08/2020

Superseded General Decision Number: MI20190075

State: Michigan

Construction Type: Heavy

County: Wayne 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 \$10.80 for calendar year 2020 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 \$10.80 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 2020. 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](http://www.dol.gov/whd/govcontracts).

Modification Number	Publication Date
0	01/03/2020
1	05/08/2020

BOIL0169-003 03/01/2018

	Rates	Fringes
BOILERMAKER.....	\$ 38.65	26.22

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CARP0687-008 06/01/2019

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 32.70	28.94
PILEDRIVERMAN.....	\$ 32.70	28.94

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ELEC0017-003 06/03/2019

	Rates	Fringes
LINE CONSTRUCTION: Linemen/Cable Splicer.....	\$ 46.40	20.62

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\* ELEC0058-007 09/01/2019

	Rates	Fringes
ELECTRICIAN.....	\$ 42.39	24.85

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ENGI0325-019 09/01/2019

POWER EQUIPMENT OPERATORS: Underground Construction (Including Sewer)

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1.....	\$ 34.63	24.35
GROUP 2.....	\$ 29.90	24.35
GROUP 3.....	\$ 29.17	24.35
GROUP 4.....	\$ 28.60	24.35

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

ENGI0326-008 06/01/2019

EXCLUDES UNDERGROUND CONSTRUCTION

	Rates	Fringes
OPERATOR: Power Equipment		
GROUP 1.....	\$ 41.89	24.45
GROUP 2.....	\$ 40.39	24.45
GROUP 3.....	\$ 38.89	24.45
GROUP 4.....	\$ 38.59	24.45
GROUP 5.....	\$ 37.77	24.45
GROUP 6.....	\$ 36.91	24.45
GROUP 7.....	\$ 35.94	24.45
GROUP 8.....	\$ 34.23	24.45
GROUP 9.....	\$ 25.89	24.45

FOOTNOTES: Tower cranes: to be paid the crane operator rate determined by the combined length of the mast and the boom.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane with boom & jib or leads 400' or longer

GROUP 2: Crane with boom & jib or leads 300' or longer

GROUP 3: Crane with boom & jib or leads 220' or longer

GROUP 4: Crane with boom & jib or leads 140' or longer

GROUP 5: Crane with boom & jib or leads 120' or longer

GROUP 6: Regular crane operator

GROUP 7: Backhoe/Excavator, Bobcat/Skid Loader, Boring Machine, Broom/Sweeper, Bulldozer, Grader/Blade, Loader, Roller, Scraper, Tractor, Trencher

GROUP 8: Forklift

GROUP 9: Oiler

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 IRON0025-006 06/01/2019

	Rates	Fringes
IRONWORKER		
Reinforcing.....	\$ 30.98	27.99

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Structural.....\$ 36.77 29.03

LABO0334-009 06/01/2019

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
Landscape Laborer		
GROUP 1.....	\$ 20.75	7.10
GROUP 2.....	\$ 18.75	7.10

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

LABO0334-021 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.....	\$ 22.42	16.80
(2) Mason Tender- Cement/Concrete.....	\$ 22.53	16.80
(4) Grade Checker.....	\$ 22.66	16.80
(5) Pipelayer.....	\$ 22.72	16.80
(7) Landscape.....	\$ 16.79	16.80

LABO1191-004 06/01/2019

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
Laborers:		

Common or General; Grade  
 Checker; Mason Tender -  
 Cement/Concrete; Pipelayer..\$ 28.55 16.85

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 PAIN0022-005 07/01/2008

	Rates	Fringes
PAINTER		
Brush & Roller.....	\$ 25.06	14.75
Spray.....	\$ 25.86	14.75

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 PLAS0067-002 04/01/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 30.63	14.07

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 PLUM0098-005 06/01/2019

	Rates	Fringes
PLUMBER.....	\$ 35.77	35.13

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 PLUM0636-002 06/05/2017

	Rates	Fringes
PIPEFITTER.....	\$ 40.41	29.35

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 TEAM0007-006 06/01/2019

	Rates	Fringes
TRUCK DRIVER		
Dump Truck under 8 cu. yds.; Tractor Haul Truck....	\$ 27.15	.50 + a+b
Dump Truck, 8 cu. yds. and over.....	\$ 27.25	.50 + a+b
Lowboy/Semi-Trailer Truck...	\$ 27.40	.50 + a+b

FOOTNOTE:  
 a. \$446.70 per week.  
 b. \$67.00 daily.

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 SUMI2010-073 11/09/2010

	Rates	Fringes
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TRUCK DRIVER: Off the Road		
Truck.....	\$ 20.82	3.69

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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](http://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)).

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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

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""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.

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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

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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"

SECTION 02707

SPIN-CAST GEOPOLYMER PIPE

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies a Spin-Cast Geopolymer Pipe (SCGP) that provides for the rehabilitation of existing sanitary sewer pipelines, channels and manholes, structural coating, using an approved structural geopolymer lining system. This Specification covers the general requirements for the referenced specifications, liner manufacturer and installer qualifications, submittal and guaranty guidelines, materials, pre-installation and installation procedures, and testing. The liner may be spin cast or hand sprayed to various pipe surfaces including: brick, concrete, corrugated metal, clay tile, and various other compatible materials.
- B. Furnish all labor, materials, equipment and incidentals required to install the monolithic geopolymer sewer pipe and manhole lining system and appurtenances as specified herein. The lining system shall be used to rehabilitate the interior of all designated sewer pipelines or manholes.
- C. The manhole lining system shall consist of a geopolymer coat applied to the cleaned and prepared surfaces.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM C-33 – Standard Specification for Concrete Aggregates.
  - 2. ASTM C-39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
  - 3. ASTM C-78 – Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading). (Note: ASTM C293 – Standard Test method for Flexural Strength of Concrete (Using Simple Beam With Center-Point Loading) – Is not a substitute test for the more conservative ASTM C78, ASTM C293 provides flexural strengths significantly higher than ASTM C78 due to relaxed loading conditions which are not appropriate for this type of structural repair).
  - 4. ASTM C-109 – Standard Test method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in Cube Specimens).
  - 5. ASTM C-172 – Standard Practice for Sampling Freshly Mixed Concrete.
  - 6. ASTM C-267 – Standard Test methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes.
  - 7. ASTM C-469 – Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
  - 8. ASTM C-496 – Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
  - 9. ASTM C-666 – Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

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10. ASTM C-801 – Standard Test Method for Time of Setting of Hydraulic Cement Mortar by Modified Vicat Needle.
  11. ASTM C-882 (Type II or Type V) – Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete By Slant Shear.
  12. ASTM C-1090 – Standard Test Method for measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout.
  13. ASTM F-2414 - Standard Practice for Sealing Sewer Manholes Using Chemical Grouting.
  14. ASTM F-2551 – Standard Practice for Installing a Protective Cementitious Liner System in Sanitary Sewer Manholes.
- B. American Concrete Institute (ACI):
1. ACI 305R-99 Hot Weather Concreting
  2. ACI 306R-88 Cold Weather Concreting
  3. ACI Certified Concrete Field-Testing Technician, Level 1
- C. National Association of Sewer Service Companies:
1. NASSCO Pipeline Assessment & Certification Program (PACP)
- D. Occupational Safety and Health Administration (OSHA):
1. Regulations Standard – 29 CFR

Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

### 1.3 SUBMITTALS

- A. Product Data:
1. Submit Manufacturer’s product data and installation instructions. Include required substrate preparation, on-site quality assurance recommendations and a list all materials to be used.
- B. Certifications:
1. Manufacturer shall submit a letter of certification that the product meets or exceeds all technical and packaging requirements.
  2. Manufacturer shall submit original third-party verification that materials meet physical properties specified for design at 24hr and 28 day, minimally ASTM C-78, ASTM C-39 or C-109, ASTM C-882, and ASTM C-1090. Further Manufacture shall submit original third-party verification of test data for ASTM C-666 testing for samples cured 28 days and subjected to 300 cycles.
  3. Manufacturer shall submit original third-party verification of material formulation via XRF (X-ray Fluorescence) data as detailed in the material section.
  4. Submit Manufacturer's certifications that materials have been approved for the installation conditions shown on the Drawings and as specified herein.
  5. Submit Manufacturer’s Materials Warranty certificate.
  6. Submit Installer’s warranty certificate.
  7. Submit Installer’s job history and reference certificate.
- C. Qualifications:

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1. The Contractor performing the work shall be fully qualified, experienced and equipped to complete this work expeditiously, in a satisfactory manner, and shall be an approved installer of the geopolymer lining system as certified and licensed by the Manufacturer.
  2. The Manufacturer shall submit documentation and verifiable references for installation the proposed lining system in a minimum of 100 vertical linear feet for manhole qualifications.
  3. The Manufacturer shall submit documentation and verifiable references for installation the proposed lining system in a minimum of 5000 linear feet of large diameter (>36 inch) horizontal pipe for pipeline qualifications.
  4. The Contractor shall submit a certified statement from the Manufacturer certifying them as a certified and/or licensed installer of the liner.
  5. The Contractor shall also be capable of providing crews as needed to complete this work without undue delay.
  6. The Geopolymer Installer must submit a work plan showing how the work shall be scheduled and coordinated.
  7. The Owner reserves the right to approve or disapprove the Contractor, based on the submitted qualifications.
- D. Liner Thickness Design Calculations:
1. Submit liner design thickness calculations using the design parameters given in this specification.
- E. Post-lining tapes and logs:
1. Submit copies of the cure logs for all work.
- F. CCTV Post-Rehab Video:
1. Submit CCTV video showing the rehabilitated sewer and manholes.
- 1.4 DELIVERY, STORAGE AND HANDLING
- A. Delivery of Materials:
1. Deliver material in Manufacturer's original unopened and undamaged packages.
  2. Clearly identify Manufacturer, brand name, contents and stock number on each package.
  3. Packages showing indications of damage that may affect condition of contents are not acceptable.
- B. Storage of Materials:
1. Store in original packaging under protective cover and protect from damage.
  2. Store all materials at temperatures recommended by manufacturer.
  3. Stack containers/bags in accordance with manufacturer's recommendations.
- C. Handling of Materials:
1. Handle materials in such a manner as to prevent damage to products or finishes.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS and PRODUCTS

- A. GeoSpray® & GeoSpray® AMS  
GreenTree Solutions a division of ClockSpring|NRI  
David Keaffaber (317) 306-6595  
[www.clockspring.com](http://www.clockspring.com)
- B. Quadex® GeoKrete®  
Vortex Companies  
Matthew Richards (914) 512-7713  
[mrichards@vortexcompanies.com](mailto:mrichards@vortexcompanies.com)
- C. Or approved equal

2.2 MATERIAL SPECIFICATIONS

- A. Geopolymer Pipe Lining Mortar:
  - 1. The geopolymer lining shall conform to the following properties under laboratory conditions.

**Table 1 Minimum Geopolymer Liner Material Requirements**

Compressive Strength	ASTMC39 or C109	1 Day	2,500 psi
		28 Day	8,000 psi
Flexural Strength	ASTM C78	7 Day	750 psi
		28 Day	800 psi
Tensile Strength	ASTM C496	28 Day	800 psi
Shrinkage	ASTM C1090	28 Day	0% at 65% RH
Modulus of Elasticity	ASTM C469	1 Day	3,000,000 psi
		28 Day	5,000,000 psi
Bond Strength	ASTM C882 Type II	1 Day	900 psi
		28 Day	2,500 psi
Freeze Thaw Durability	ASTM C666	300 Cycles	Zero Loss
Set Time	ASTM C807	Initial	Less Than 75 min
		Final	Less Than 240 Min

- B. The SCGP lining geopolymer mortar shall be composed of at minimum 70% Pozzolan material selected from the list of: SiO<sub>2</sub>, MgO, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub> and be verified by third party certified X-ray Fluorescence (XRF) testing.
- C. Particle size of maximum aggregate of 2.38 mm based on 100% of material (except fibers) passing the No.8 Sieve.
- D. The lining shall be compatible with the thermal and chemical conditions of the existing sewer structures. Surface temperatures will range from 20°F to 100°F and pH may range as low as 1.0.

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- E. Acid Mitigation System (AMS):
1. The finished geopolymer liner shall be capable of sustaining in low pH environments. Geopolymer manufacturer must demonstrate the geopolymer liner has zero mass loss in 12 week sulfuric acid at 1.0 pH immersion per ASTM C267. If the lining mortar does not achieve the specified chemical resistance on its own then a liquid sealant must be applied to the geopolymer lining mortar after the final thickness has been applied. The sealant is designed to provide additional chemical protection for the geopolymer lining from microbial induced corrosion (MIC) and should be designed to function with the geopolymer lining.
- F. Additional Materials:
1. Additional materials including chemical and cement grouts necessary to stop infiltration and create a surface for the geopolymer lining shall be applied as necessary.
  2. Specific materials must be compatible with the geopolymer lining and the Owner reserves the right to require preapproval of such materials.
  3. Chemical grout shall be acrylamide grout such as Avanti AV100 or approved equal.
  4. Cement grout shall be Neat Ash cement grout mix provided by a ready-mix company. Neat Ash mix design shall be made using ASTM C-150 Type I Cement, ASTM C-618 Class C Flyash Class C, and water with a 500 psi minimum 28-day compressive strength.

### 2.3 DESIGN - GEOPOLYMER LINER THICKNESS

- A. The Contractor shall submit liner thickness calculations to the Engineer for review.
- B. These calculations will be performed by a third party registered professional engineer registered in the State of Michigan using the following minimum criteria:
1. Design Life: 50 years
  2. Safety Factor: 2
  3. Ovality: 3% or the actual ovality of the sewer section, whichever is greater. For noncircular and irregular shape sewer, the calculation shall take into consideration any additional consideration due to noncircular shape.
  4. External Hydrostatic Pressure: 3 feet below ground surface.
  5. External Earth Load: 33 feet over top of pipe. Calculations for the thickness of the geopolymer liner shall be furnished by the Contractor shall include allowances for deflection, shrink-back, stiffness, ring bending and buckling, and shall have sufficient water tightness, and structural strength to support all dead loads, live loads, and groundwater load.
  6. Live Load: AASHTO HS-20
- C. The structural geopolymer lining rehabilitation systems shall be designed in accordance with a fully deteriorated pipe condition for structural linings conditions.
- D. The minimum structural liner thickness, independent of design, shall be 1.5 inches and the maximum thickness shall be 1.75 inches.
- E. The minimum liner thickness, independent of design, shall be 1.0 inches for all manholes.

- F. The Contractor shall submit their price proposal based on the appropriate length, size and existing pipe parameters designated in the Proposal Section.
- G. Structural Design should be based on physical properties of materials and should use the more conservative ASTM C78 values for Flexural Strength not values obtained from ASTM C293.
- H. The deterioration of pipelines and manholes is an on-going process. Should pre-construction inspections reveal the pipeline and manhole system to be in a substantially different conditions than those in the design considerations, the Contractor shall notify Owner of such conditions making the current design unacceptable.
- I. The liner shall be designed to withstand differential settlements of up to 1/350 angular distortion.

### PART 3 EXECUTION

#### 3.1 GENERAL

- A. All structural rehabilitation of existing pipe and manhole sections will follow the procedures listed below.
- B. The Contractor shall carry out their operations in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving work on an elevated platform and entry into a confined space.
- C. The Owner will be responsible for locating and identifying manholes at lining location.
- D. The Contractor shall make all necessary arrangements for access to water hydrants for cleaning and other work items requiring water. The Contractor shall coordinate with the City of Wyandotte for hydrant use, necessary backflow preventer, meter, and pay all associated fees.
- E. All surfaces, which have been damaged by the Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of the Contractor's operations. Suitable materials and methods shall be used for such restoration, and the Owner reserves the right to approve both the methods and materials. The restoration of existing property or structures shall be done as promptly as practical and shall not be left until the end of the construction period. Compensation for this work will be included in the rehabilitation item to which it pertains.
- F. Personnel shall treat all waste matter and materials removed from the sewer pipe as a contaminated material, unless otherwise specified.
- G. All contaminated substances from sanitary sewers such as fallen brick, sand debris, sludge and organic matter must be disposed of in the proper manner according to local ordinances.

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### 3.2 PIPE CLEANING

- A. Complete initial sewer cleaning as specified in Section 02751 Sewer Cleaning to remove debris currently in sewer.
- B. Pipe cleaning for SCGP shall be as specified herein.
- C. Properly cleaning the surface of the pipe is critical to the success of this rehabilitation method.
- D. All internal debris should be removed from the original pipeline. Gravity pipes should be cleaned with hydraulically powered equipment, high-velocity jet cleaners, or mechanically powered equipment.
- E. If pipe diameters allow for manned entry, the use of high-pressure washers delivering a minimum of 3500psi may be utilized.
- F. The use of higher-pressure washers may be required to achieve the desired surface condition. Mechanical cleaning and chipping methods will be required to remove loose brick to establish solid substrate.
- G. The surface of the pipe to be lined shall be capable of directly receiving the lining material.
- H. When grease and oil are present within the pipe, water may be heated to 200 degrees, or an approved detergent may be added to the water or a dilute solution of muriatic acid may be used integrally with the high-pressure cleaning water.
- I. All materials resulting from the cleaning of the pipe shall be removed prior to application of the geopolymer lining material.
- J. All loose or defective concrete, brick, or grout shall be removed to provide an even surface prior to application of the geopolymer lining material.
- K. Clean and re-clean pipe surface as necessary and coordinate with flow bypass system operations. Flow bypass system operates only during dry weather daylight hours and sanitary flow is returned each night to the sewer being rehabilitated.
- L. Prepare test section to demonstrate effort and methods to obtain cleaning and surface preparation requirements.

### 3.3 PRE-INSPECTION

- A. The Contractor will perform a pre-installation television inspection that meets NASSCO PACP requirements.
- B. Utilizing a color video inspection system (CCTV) with data recording capabilities, the entire pipe section to be lined shall be recorded on CD or DVD and two (2) copies produced. The interior of the pipe shall be carefully inspected to determine the location of any conditions, which may prevent the proper installation of the geopolymer liner, and it shall be noted so that these conditions can be corrected. A CD, DVD or other digital recording and suitable log shall be submitted to the Owner.

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- C. A 360-degree Pan-and-Tilt view camera shall be used to inspect the pipe traveling upstream. At each connection the operator will stop and turn the camera lens toward the lateral thereby inspecting the first 8 to 12 inches of the lateral connection. If there remains a doubt as to whether or not the connection is live, additional “dye and flush” tests shall be performed as necessary.
- D. For each existing service connection determined by the Owner to be active, the Contractor shall determine the condition of the service connection to the main, make his recommendation for lateral connection repair, and record both items in his log. All lateral locations will be measured from the back wall (opposing wall) of the basis manhole, typically the downstream manhole.
- E. Verify that pipe and or manhole is clean, and conditions are suitable for installation of the geopolymer liner.
- F. Notify Engineer if conditions exist which will impact the installation.
- G. If pre-installation video inspection using PACP certified operators reveals an obstruction in the line segment (such as heavy solids, dropped joints, protruding service connections or collapsed pipe) that cannot be removed by conventional sewer cleaning equipment and the obstruction will prevent completion of the insertion process, perform point repairs or obstruction removal prior to the geopolymer liner installation. Obtain approval of the Engineer before performing work.

### 3.4 PREPARATION AND PRE-LINING REPAIRS

- A. If the cleaning process reveals that the pipe invert, crown or sidewalls are deteriorated, measures will be taken to provide a continuous slope to the pipe, including the use of a flowable fill or the introduction of the wall lining material onto the pipes surface.
- B. Any open joints will be sealed with the geopolymer lining material prior to the lining of the pipe.
- C. The floor and interior walls of the pipe shall be thoroughly cleaned and made free of all foreign materials including dirt, grit, roots, grease, sludge and all debris or material that may be attached to the wall or bottom of the pipe.
- D. Active leaks must be seal prior to application of the lining material.
- E. The use of quick-setting mortars or chemical grouts are approved methods for stoppage of active leaks. All products employed in the stoppage of active leaks should be preapproved by the Owner and used in accordance with Manufacture’s recommendations. Larger voids shall be filled using Neat Ash cement grout.
- F. If additional repair procedures must be undertaken by the Contractor to prepare the existing structure for lining a plan will be submitted for approval of the Owner prior to proceeding.
- G. The Contractor shall accurately field measure and size each individual manhole. The Contractor is reminded that each existing sewer manhole designated to receive the lining may have a different configuration and varying field dimensions.

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- H. The Contractor shall accurately field measure and size each individual pipe sections. The Contractor is reminded that each existing sewer designated to receive the lining may have a different configuration and varying field dimensions.
- I. The Contractor is advised that the presence or absence of leakage through manhole walls is dependent upon the ground water levels and conditions at the time of the inspections. All leakage shall be stopped prior to lining any structures.
- J. Remove existing steps from manholes being lined. Cut existing steps flush with manhole surface and stop all leaks prior to lining structure.

### 3.5 PREPARATION OF GEOPOLYMER LINING MATERIAL

- A. Contractor shall mix geopolymer material to Manufacture's recommended water cement ratio. Precision metering of water in a continuous mixing chamber is required to maintain the strict water to material ratio. It is important to maintain the specified water to geopolymer ratio throughout the application process. Uniform water to polymer ratio equates to consistent strength. The ability to closely adjust and monitor the addition of water through the use of a sight tube system is required.
- B. Mixing water temperatures must be determined before blending operations begin. The mixing water temperature must be recorded in the daily operation log at multiple times throughout the day during the installation process. If water temperatures exceed 80°F, then the water should be chilled to 80°F or lower. The ability to provide mixing water at a consistent temperature is a critical aspect of the mixing and installation process. Industrial electronic chillers are available and should be of a suitable capacity to provide the proper amount of water and at the required temperature. High temperature applications, those greater than 80°F, require the use of water chillers to maintain the water at the proper temperature.
- C. The geopolymer lining material shall be mixed in a high shear mixer. This ensures thorough and uniform mix of water with the material prior to pumping. Begin pumping through an adjustable rotor stator pump for continuous delivery to the appropriate application device.
- D. The mixing operations must be performed so that the minimum of dust is released into the surrounding environment.
- E. This process requires the use of continuous automated mixing and pumping, which eliminates human error and mechanical issues associated with maintaining consistent water/material ratio, mix time, mix speed and dwell time prior to pumping. The automation of dry material feed rate, precise metering of water and pump rate eliminates wet/dry and thick/thin variations resulting in a uniform structure regardless of the pumping distance.
- F. Pumps must be equipped with multiple sensors that stop the pump if material either runs out or is overflowing.
- G. Multiple spin casting units should be onsite to address any application issues that arise during the lining process.

- H. Multiple spin cast nozzles should be onsite at all times to address any application issues or failure of the nozzle. Multiple nozzles may be required to produce the required depth or finish of the liner surface.

### 3.6 SPIN-CASTING APPLICATION OF GEOPOLYMER LINING

- A. The work consists of spray applying and/or centrifugally spin-casting the specified geopolymer liner material to the inside of an existing structure. The necessary equipment and application methods to apply the liner materials shall be only as approved by the material Manufacturer. Material shall be mixed in accordance with Manufacturer's specifications to proper consistency, then the materials shall be pumped through a material plaster hose for delivery to the appropriate and / or selected application device.
- B. The mortar delivery hose shall be coupled to a high-speed rotating applicator device.
- C. The rotating casting applicator shall then be positioned within the center, or positioned higher inside the pipe, as required by the diameter the pipe
- D. The spin cast nozzle must be cable of bidirectional operation.
- E. The spin cast nozzle should be attached to a reciprocating head. The reciprocating head allows the spin cast mechanism and the associated selected nozzle to make multiple passes on the pipe wall in a single pass of the sled assembly.
- F. The high-speed rotating applicator shall then be initialized, and pumping of the material shall commence. As the material begins to be centrifugally cast evenly around the interior of the cavity, the rotating applicator head shall uniformly travel back and forth at or near the center point of the pipe at a controlled frequency conducive to providing a uniform material thickness to the pipe walls.
- G. Controlled multiple passes shall then be made until the specified minimum finished thickness is attained. If the procedure is interrupted for any reason, the operator shall arrest the retrieval of the applicator head until flows are recommenced.
- H. Spraying shall be performed by starting at the pipe end-project location and progressing towards the entrance of the pipe.
- I. Begin at one side of the pipe and retract the spin cast assembly at a monitored uniform rate. Just as important as knowing that a consistent amount of water is being added to the mix, the retrieval rate of the spin head must be measurable and constant. At the beginning of each pipe segment the retraction device should be calibrated. The calibration process includes setting the digital readout to the desired retrieval rate. Then the retrieval system is laid out and marked to show the distance traveled in two minutes. The rate obtained must be within 5% of the expected speed and can be verified by this process.
- J. The geopolymer liner shall be applied to a specified uniform minimum thickness and can be applied in multiple passes.
- K. Material thickness may be verified at any point with a depth gauge and shall be no less than a uniform 1/4-inch. If additional material is required at any level, the rotating applicator head



shall be placed at the location and application shall recommence until that area meets the required thickness.

- L. The geopolymer lining material shall be applied to a damp surface, with no flowing water.
- M. When the pipe is sufficiently out of round hand spray application of the geopolymer lining maybe necessary, the mortar delivery hose shall be coupled to a medium-velocity spray application nozzle. Pumping of the material shall commence and the material shall be atomized by the introduction of air at the nozzle, creating a medium-velocity spray pattern for material application.
- N. Hand spraying shall be performed by starting at the bottom of the structure and progressing up the wall.
- O. The medium-velocity spray nozzle and the centrifugal spin casting head may be used in conjunction to facilitate uniform application of the material to irregularities in the contour of the pipe walls.
- P. If desired, the geopolymer liner may be troweled following the spray application. Initial troweling shall be in an upward motion, to compress the material and solidify the pipe wall. Precautions shall be taken not to over-trowel. Only a wood float or Magnesium (Mg) float should be utilized.

### 3.7 CURING OF GEOPOLYMER LINING

- A. Follow manufacturer's recommended cure schedule in curing of the geopolymer liner. The material must be allowed to cure a minimum of 2 hours or until the material has reached an initial set condition whichever is longer prior to the release of bypass or flow through the pipe.
- B. The Contractor shall coordinate application of SCGP with flow bypass operations to allow for sufficient cure time before reestablishing flow.
- C. The Contractor is responsible for removing and reinstalling all SCGP damaged from reinstated wet weather and/or dry weather flow.
- D. Proper steps shall be taken to ensure the material is cured in a moist and moderate climate. General underground conditions are usually adequate to meet this curing requirement. However, when situations of dry and/or hot conditions are present, the use of a wind barrier and fogging spray may be required.
- E. The geopolymer liner should not be placed when the ambient temperature is 37°F and falling or when the temperature is anticipated to fall below 32°F during the next 24 hours, unless specific precautions are employed.
- F. Refer to ACI 305R-99 Hot Weather Concreting. Do not apply geopolymer liner material when ambient and surface temperatures are 100°F or 35°C and above. Shade the material and prepare the surface to keep it cool. To extend working time, mix the material with chilled water. Be certain the substrate is saturated surface dry (SSD) before application begins. Proper curing is always required and is particularly important in hot weather.

- G. Refer to ACI 306R-88 Cold Weather Concreting. Low-substrate and ambient temperatures slow down the rate of set and strength development. At temperatures below 45°F or 7°C, warm the material and monitor substrate temperatures. Properly ventilate the area when heating. Protect the new liner from freezing in the first 6 hours after application.

### 3.8 TERMINATION AND SEALING AT MANHOLE OUTLETS AND MID-PIPE

- A. Termination of the geopolymer liner at the end of a pipe or manhole shall be completed by hand applying the geopolymer liner to the outer surface of the pipe or into the interior of the manhole.
- B. Termination of the geopolymer liner at mid-pipe must be sealed and locked in utilizing a cut keyway (1-1/2" deep and 4" wide). Hand apply geopolymer liner at keyway forming a smooth transition to the surrounding pipe surface.

### 3.9 INTERNAL RECONNECTION OF LATERAL SERVICES

- A. The Contractor shall reopen the existing active connections after the final geopolymer lining pass. Restored openings shall be neatly and smoothly open and without rough edges. Care must be exercised not to damage the geopolymer lining while reinstating the lateral.

### 3.10 APPLICATION OF LIQUID SEALANT

- A. Apply a manufacturer approved post geopolymer sealant to sewer and manholes.
- B. The sealant shall be used full strength as received from the manufacturer and shall not be diluted.
- C. The sealant may be applied during the application of the geopolymer liner or anytime thereafter using a pressurized spray device to the Manufacturer's recommendation
- D. The sealant shall be applied adequately to achieve surface saturation.
- E. The sealant must be allowed to cure for a minimum of 6 hours to ensure that the surface has dried to releasing bypass.

### 3.11 POST APPLICATION INSPECTION

- A. The Contractor will perform a post-installation television inspection that meets NASSCO PACP requirements. The video will show the completed work, including condition of restored connections.
- B. Utilizing a color video inspection system (CCTV) with data recording capabilities, the entire pipe section to be lined shall be recorded on CD or DVD or other digital method and a copy will be provided to the Owner for Approval.
- C. All manhole/junction box work and annular seal shall be completed at time of Post-TV, with Post-TV being verification of completion.

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3.12 FINAL CLEANUP

- A. Upon completion of rehabilitation work and testing, clean and restore project area affected by the Work.

3.13 QUALITY CONTROL, QUALITY ASSURANCE AND INSPECTIONS

A. GENERAL

1. It is hereby the stated policy that all services will be performed by the protocol specified including ACI, ASTM, NASSCO, OSHA or other appropriate guidelines. The final results will be of the highest quality possible, delivered on the date promised.
2. All equipment and supplies shall be obtained and maintained in order to produce results of the highest quality while meeting ACI, ASTM, NASSCO, OSHA or other appropriate guidelines.
3. Personnel shall be fully qualified to perform the tasks assigned to them.
4. Continuing education and monitoring of the performance of personnel and equipment will be reviewed by management. Corrective action will be taken immediately if a problem is identified.
5. Quality assurance and quality control objectives are to produce rehabilitated structures of the highest quality.

B. DAILY LOGS

1. A daily activity log will be filled out completely anytime a work crew is on site. This log includes listing the personnel present at the site, when they arrived and when they left the site.
2. Important spray data includes the times material was applied and under which atmospheric conditions. The ambient air temperature, the dry powder temperature, the mixing water temperature, and the temperature inside the pipe are all recorded on the daily activity report.
3. The operating conditions are also recorded. These measurements include the water addition rate taken at the meter tube, the retrieval speed of the retraction system and the pump motor speed recorded at the pump. Any special conditions are to be noted in the daily log.
4. Amount of material used and work completed will be summarized on the log.
5. A copy of the daily log for all days of work on the project will be provided in the final quality assurance documentation provided to the owner.

C. EQUIPMENT CALIBRATION REPORTS

1. All applicable equipment calibrations must be maintained on site by the superintendent and available for inspection upon request of the Owner.

D. INSPECTIONS

1. Inspections of the lining products and materials may also be made by the owner after delivery. The lining products and materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Lining materials rejected after delivery shall be marked for identification and shall be removed from the job at once.

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E. TESTING AND ACCEPTANCE

1. The completed liner shall be smooth and free from honeycomb and areas of segregation.
2. Contractor shall employ an independent third party ACI certified testing agency to conduct and report compressive strength testing of the concrete utilized in the rehabilitation.
3. At a minimum this shall include compressive strength (ASTM C39 or C-109) Min 8,000 psi at 28days tests. Additional samples may be held for retesting at 56 days in necessary.
4. Testing frequency shall include the first and last day of construction and: (a) the more frequent of once every 10 manholes or once for every 40,000 pounds of dry geopolymer material applied for manhole applications and (b) the more frequent of once every other day of application or once for every 40,000 pounds of dry geopolymer material applied for manhole applications
5. Thickness verification can be done with mass balance calculations where you calculate the amount of material that went in over the surface area to get an average depth.
6. Small plastic indicator tabs can be attached on the structure to verify the proper thickness is achieved. These are positioned to be just below the specified thickness and are left in place when sprayed over.
7. In addition, the engineer may request the contractor to remove a test core from the installed liner, at established intervals. This is at the Contractors' expense. The Contractor shall mark the core samples with the date that the liner was installed, the date that the core was removed, and the location taken. When requested by the engineer, the liner shall be cored at three different clock positions, and the average thickness measured shall be taking as the actual thickness of the liner. If a sample is not within 90% of the specified minimum thickness and or 90% of the 28-day compressive strength, the liner is considered unacceptable. Submit a proposed method of repair or replacement for review and approval by the engineer. Work required to remedy nonconforming work shall be at no additional cost.
8. If the thickness or compressive strength of the installed spin cast pipe lining is less than 90 percent of the specified values, the product is considered unacceptable. Submit a proposed method of repair or replacement for review and approval by the Engineer. Work required to remedy non-conforming work shall be at no additional cost to the Owner.
9. If it is determined that the geopolymer liner material did not match the submitted manufacturers claims, the product is considered unacceptable and non-conforming. Submit proof that the geopolymer liner meets the requirements of the specification through the use of samples analyzed or retained at the manufacturing facility, or submit a method for replacement of the sewer segment liner for review and approval by the Owner. Work required to remedy non-conforming work shall be at no additional cost to the Owner.
10. For all instances, where the geopolymer liner is deemed unacceptable, other than thickness, for compressive strength, as described in this specification section, submit a proposed method of repair or replacement for review and approval by the Engineer. Work required to remedy non-conforming work shall be at no additional cost to the Owner.

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3.14 MEASUREMENT AND PAYMENT

A. MEASUREMENT

1. Unit of measure for **Spin-Cast Geopolymer Lining, Mh, 48" inch** will be the actual number of vertical feet of manhole from the base surface elevation to the manhole chimney per barrel diameter. The same measurement will apply for the invert, any landings and also the chimney where it decreases in diameter. No adjustment in measurement will be made for these flat surfaces and the narrowing manhole diameter often found at the top.
2. Unit of measure for **Spin-Cast Geopolymer Lining, Sewer, 60 inch** will be actual number of linear feet.
3. Unit of measure for **Chemical Grout** will be the actual number of gallons installed.
4. Unit of measure for **Neat Ash Cement Grout** will be the actual number of cubic feet installed.
5. Unit of measure for **Mechanical Cleaning/Chipping** will be the actual number of square feet completed after the initial sewer cleaning is completed as specified in Section 02751 Sewer Cleaning. The Engineer and Contractor will review and establish a post cleaning baseline. The actual area of **Mechanical Cleaning/Chipping** completed will be measured and compare to the established baseline condition to determine the payment quantity.

B. PAYMENT

1. Payment for **Spin-Cast Geopolymer Lining, Mh, 48" inch** shall be made at the Contract unit price per vertical foot for geopolymer liner, which price and payment shall include but not limited to minor complications and/or delays, cleaning (and re-cleaning) and preparing (and re-preparing) surfaces, patching, reapplying SCGP damaged as a result of reinstating flow too soon on uncured material, traffic maintenance & protection, removing existing steps, testing and all labor, materials, tools, fees, equipment and incidentals needed to complete work specified.
2. Payment for **Spin-Cast Geopolymer Lining, Sewer, 60 inch** shall be made at the Contract unit price per linear foot for geopolymer liner, which price and payment shall include but not limited to minor complications and/or delays, traffic maintenance & protection, cleaning (and re-cleaning) and preparing (and re-preparing) surfaces, patching, reapplying SCGP damaged as a result of reinstating flow too soon on uncured material, testing and all labor, materials, tools, fees, equipment and incidentals needed to complete work specified.
3. Payment for **Chemical Grout** shall be made at the Contract unit price per gallon installed. Price and payment shall include all labor, materials, tools, and equipment required to install grout and stop infiltration.
4. Payment for **Neat Ash Cement Grout** shall be made at the Contract unit price per cubic foot installed. Price and payment shall include all labor, materials, tools, and equipment required to install grout to fill larger voids.
5. Payment for **Mechanical Cleaning/Chipping** shall be made at the Contract unit price per square foot. Price and payment shall include all labor, materials, tools, and equipment to complete the work as specified including removal and disposal of brick, mortar, and other debris.

END OF SECTION