



March 13, 2025

VIA E-MAIL: ee.water.enforcement.report@arkansas.gov

Arkansas Department of Energy and Environment
Division of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: City of Malvern, Arkansas
NPDES Permit No. AR0034126, AFIN 30-00040
CAO LIS 24-045
Monthly Progress Report 11

Dear Sir or Madam:

The manhole rehabilitation project was approved by the Arkansas Department of Health (ADH) on March 4, 2025. It is currently under review by the Natural Resources Division of the Arkansas Department of Agriculture. A copy of the regulatory review set of contract documents and specifications is included with this progress report.

Ten (10) sanitary sewer overflows (SSOs) were observed during the month of March 2025. The SSOs are summarized in **Table 1**:

MH No.	Start Date	End Date	Cause	Estimated Volume
0069	2/11/25	2/11/25	Rain & Tripped Breaker	19,000 gallons
0069	2/12/25	2/13/25		
0069	2/15/25	2/17/25		
0069	2/25/25	2/25/25		
0086	2/11/25	2/11/25	Rain	417,000 gallons
0086	2/12/25	2/13/25		
0086	2/15/25	2/17/25		
0155	2/11/25	2/11/25	Rain	19,000 gallons
0155	2/12/25	2/13/25		
0155	2/15/25	2/17/25		

Table 1: March 2025 SSOs

Samples from sites 1, 2, 3 & 4 were obtained and the public was notified in accordance with the approved sampling and communications plan. Results can be found on the associated discharge monitoring report. Should you have any questions or concerns, please don't hesitate to reach out anytime at 501.664.1552.

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Progress Report 11

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Sincerely,

Crist Engineers, Inc.

A handwritten signature in blue ink, appearing to read "Mason Allen", with a stylized flourish at the end.

Mason Allen, P.E.

Cc: Honorable Brenda Weldon, Mayor, City of Malvern
Carl Wheatley, Manager, Malvern Water Works
Leslie Allen-Daniel, DEQ

Enclosures: Manhole Rehabilitation for Sanitary Sewer Overflow Reduction

CONTRACT DOCUMENTS AND SPECIFICATIONS

MANHOLE REHABILITATION FOR SANITARY SEWER OVERFLOW (SSO) REDUCTION



MALVERN WATER

QUALITY SINCE 1914

CITY OF MALVERN, ARKANSAS

Arkansas Department of Agriculture
Natural Resources Division
Sewer Overflow and Stormwater Reuse Municipal Grant Program
Project No. 24-024
Agreement No. 02514-OSG-G-GRANT

Regulatory Submittal

February 2025

Crist Job No. 24052



CRIST ENGINEERS, INC.

www.cristengineers.com

1 Executive Center Court
Little Rock, Arkansas 72211

Telephone: 501.664.1552
Fax: 501.664.8579

DOCUMENT 000110

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FOR SANITARY SEWER OVERFLOW (SSO) REDUCTION**

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MALVERN, ARKANSAS**

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DOCUMENT 001113

ADVERTISEMENT FOR BIDS

**MANHOLE REHABILITATION FOR
SANITARY SEWER OVERFLOW (SSO) REDUCTION
MALVERN WATER WORKS
MALVERN, ARKANSAS**

Sealed Bids for the construction of the **Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction** project will be received by **Malvern Water Works, 506 Overman St, Malvern, AR 72104** until _____ local time on _____, **2025**, at which time the Bids received will be publicly opened and read. The Project generally consists of the removal and replacement of 7 manholes and rehabilitation of 66 manholes which includes approximately 150 vertical feet of cementitious liner, repairs such as patching, grouting, sealing of pipe seals, replacement of manhole frames and covers, repairs of manholes benches and troughs, and installation of chimney seals together with incidental and ancillary work. Bids will be received for a single prime Contract. The Issuing Office for the Bidding Documents is:

**Crist Engineers, Inc.
1 Executive Center Court
Little Rock, AR 72211
(501)664-1552**

Prospective Bidders may examine the Bidding Documents at the offices of Malvern Water Works, 506 Overman St, Malvern, AR 72104 on Mondays through Fridays between the hours of 9:00 a.m. and 3:00 p.m.; and the Issuing Office on Mondays through Fridays between the hours of 8:00 a.m. and 4:30 p.m. The Contract Documents may also be examined at the following:

Dodge Reports
www.construction.com

Electronic copies of the Contract Documents may be obtained from Crist Engineers, Inc. online at www.cristengineers.com at a purchase price of **\$25.00** for each set. No refunds of payment will be made, and no partial sets will be issued. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the Issuing Office. Bid security shall be furnished in accordance with the Instructions to Bidders.

Any contract or contracts awarded under this invitation for bids will be subject to the requirements of the Arkansas Revolving Loan Fund (RLF) Programs as described in the contract documents.

All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin. Bidders on this work will be required to comply with the President's Executive Order 11246, as amended. The requirements for Bidders and Contractors under this order are explained in the specifications.

Each Bidder must comply with the requirements, terms, and conditions of the Arkansas Natural Resources Commission, the Build America, Buy America (BABA) Act under the Infrastructure and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL), Labor Standards, Equal Employment Opportunity, and the "Prohibition on certain telecommunication and video surveillance services or equipment provisions" during the performance of this contract. The Bidder commits itself to the requirements for the participation contained herein and all other requirements, terms, and conditions of these bid conditions by submitting a properly signed Bid. Each requirement listed above for the RLF programs are provided in Appendix B of the Contract Documents.

This publication was paid for by Malvern Water Works. The amount to be paid for this publication is \$_____.

Owner: **MALVERN WATER WORKS**

+ + END OF ADVERTISEMENT FOR BIDS + +

DOCUMENT 002113
INSTRUCTIONS TO BIDDERS
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ARTICLE 1 – DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office* – The office from which the Bidding Documents are to be issued.

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.01 Complete sets of the Bidding Documents may be obtained from the Issuing Office in the number and format stated in the advertisement or invitation to bid.
- 2.02 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.03 Owner and Engineer, in making copies of Bidding Documents available on the above terms, do so only for the purpose of obtaining Bids for the Work and do not authorize or confer a license for any other use.

2.04 Electronic Media Of Plans And Specifications

Engineer will provide a digital version (PDF) of the bidding documents for your convenience and use in the preparation of the Bid.

Engineer makes no representation as to the compatibility of these files with your hardware or your software.

Data contained on these electronic files is part of Engineer's instruments of service and shall not be used by the Bidder or anyone receiving this data through or from the Bidder for any purpose other than as a convenience in the preparation of the Bid. Any other use or reuse by the Bidder or others, will be at the Bidder's sole risk and without liability or legal exposure to Engineer. The Bidder agrees upon execution and submission of the Bid Form to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against Crist Engineers, Inc. (CEI), its officers, directors, employees, agents or subconsultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless CEI from all claims, damages, losses, and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files will not be considered as contract documents. Hard copies distributed to the prospective bidder govern. Significant differences may exist between these electronic files and corresponding hard copy contract documents. Engineer makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed contract documents prepared by Engineers and electronic files, the signed hard copy contract documents shall govern. You are responsible for determining if any conflict exists. By the Bidder's use of these electronic files, the Bidder is not relieved of the duty to fully comply with the contract documents.

Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, Engineer reserves the right to remove all indicia of its ownership and/or involvement from each electronic display.

Under no circumstances shall delivery of the digital electronic files for use by the Bidder be deemed a sale by CEI and CEI makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall CEI be liable for any loss of profit or any consequential damages.

- 2.05 The Revolving Loan Fund (RLF) Supplemental General Conditions contained within Appendix 1 of the Contract documents, including Provisions 1 through 54, Appendices A through E, pages 1 through 86 shall be included and provided within these Contract Documents. Where discrepancies or conflict exist between RLF Supplemental General Conditions and other sections of the Contract Documents, the RLF Supplemental General Conditions shall govern except when other sections of the Contract Documents require higher standards than those of the RLF Supplemental General Conditions, then those other sections of the Contract Documents shall govern.
- A. Bidders attention is called to the requirements of the RLF Supplemental General Conditions, including but not limited to, the "American Iron and Steel" requirement, Labor Standards, Equal Employment Opportunity, and the "Prohibition on certain telecommunication and video surveillance services or equipment". Further, Bidders will be required to submit with their Bids, a Contractor's Act of Assurance Form certifying their understanding of and compliance with the Supplemental General Conditions.
- 2.06 The City of Malvern Codes/ Ordinances are included by reference within these Contract Documents, A copy may viewed at <https://www.malvernar.gov/180/Codes>. Where discrepancies or conflict exist between City of Malvern Codes/ Ordinances and the technical specifications, the technical specifications shall govern except when City of Malvern Codes/ Ordinances require higher standards than those of the technical specifications.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within **five (5)** days of Owner's request, Bidder shall submit (a) written evidence establishing its qualifications such as financial data, previous experience, and present commitments, and (b) the following additional information:
- A. Evidence of Bidder's authority to do business in the state where the Project is located.
- B. Bidder's state or other contractor license number in accordance with Arkansas Code Ann. §17-25-401-409 (1995) in accordance with the procedures established by the Contractors Licensing Board (Reference RLF Supplemental General Conditions). Bidders are directed to Act 150 of the 1965 Acts of Arkansas, being an "Act Regulating the Practice of Contracting in the State of Arkansas". When the project presented for Bid is financed in whole or in part with State funds and is estimated to cost \$20,000.00 or more, the prospective Bidder must show evidence of license with the "Contractor's Licensing Board" for the State of Arkansas before a proposal form will be furnished.
- C. Subcontractor and Supplier qualification information; coordinate with provisions of Article 12 of these Instructions, "Subcontractors, Suppliers, and Others."

- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.
- 3.04 Bidder is advised to carefully review those portions of the Bid Form requiring Bidder's representations and certifications.

ARTICLE 4 – SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

4.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

4.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions

- 1. The Supplementary Conditions identify:
 - a. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site.
 - b. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
 - c. reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 - d. Technical Data contained in such reports and drawings.
- 2. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.
- 3. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

- B. Underground Facilities: Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site are set forth in the Contract Documents and are based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

- C. Adequacy of Data: Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions, and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated subsurface or physical conditions appear in Paragraphs 5.03, 5.04, and 5.05 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work, appear in Paragraph 5.06 of the General Conditions.

4.03 *Site Visit and Testing by Bidders*

- A. Bidder shall conduct the required Site visit during normal working hours and shall not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site.
- D. Bidder shall comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.04 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. As the General Conditions indicate, if an Owner safety program exists, it will be noted in the Supplementary Conditions.

4.05 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 5 – BIDDER’S REPRESENTATIONS

5.01 It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, and any data and reference items identified in the Bidding Documents;
- B. visit the Site, conduct a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfy itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
- C. become familiar with and satisfy itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully studied and agrees to complying with the RLF Supplemental General Conditions, City of Malvern Codes/ Ordinances, or other provided documents in the appendices or referenced herein.
- E. carefully study and agrees to complying requirements of Act 291 of 1993 concerning trenches or other excavations five feet deep or more in accordance with OSHA standards.
- F. carefully study all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings;
- G. consider the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder’s safety precautions and programs;
- H. agree, based on the information and observations referred to in the preceding paragraph, that at the time of submitting its Bid no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents;
- I. become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
- J. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder;
- K. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work; and

- L. agree that the submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.
- M. agree that the submission of a Bid to supply the names and addresses of major material Suppliers and Subcontractors in accordance with the RLF Supplemental General Conditions when required to do so by the Owner.
- N. agree that the submission of a Bid to comply with all laws, ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the contract throughout.

ARTICLE 6 – PRE-BID CONFERENCE

- 6.01 A pre-bid conference will **NOT** be held.

ARTICLE 7 – INTERPRETATIONS AND ADDENDA

- 7.01 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all parties recorded as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.02 Addenda may be issued to clarify, correct, supplement, or change the Bidding Documents.

ARTICLE 8 – BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **five percent (5%)** percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a certified check, bank money order, or a Bid bond (on the form included in the Bidding Documents) issued by a surety meeting the requirements of Paragraphs 6.01 and 6.02 of the General Conditions.
- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract Documents, furnished the required contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited. Such forfeiture shall be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.

- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the Bid opening.

ARTICLE 9 – CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be substantially completed and ready for final payment are set forth in the Agreement.

ARTICLE 10 – LIQUIDATED DAMAGES

- 10.01 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 11 – SUBSTITUTE AND “OR-EQUAL” ITEMS

- 11.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those “or-equal” or substitute materials and equipment subsequently approved by Engineer prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Engineer as an “or-equal” or substitute unless written request for approval has been submitted by Bidder and has been received by Engineer at least 15 days prior to the date for receipt of Bids. Each such request shall comply with the requirements of Paragraphs 7.04 and 7.05 of the General Conditions. The burden of proof of the merit of the proposed item is upon Bidder. Engineer’s decision of approval or disapproval of a proposed item will be final. If Engineer approves any such proposed item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidders shall not rely upon approvals made in any other manner.
- 11.02 All prices that Bidder sets forth in its Bid shall be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder’s sole risk.

ARTICLE 12 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 12.01 A Bidder shall be prepared to retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of the Work if required by the Bidding Documents (most commonly in the Specifications) to do so. If a prospective Bidder objects to retaining any such Subcontractor, Supplier, or other individual or entity, and the concern is not relieved by an Addendum, then the prospective Bidder should refrain from submitting a Bid.
- 12.02 Subsequent to the submittal of the Bid, Owner may not require the Successful Bidder or Contractor to retain any Subcontractor, Supplier, or other individual or entity against which Contractor has reasonable objection.
- 12.03 The apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening, submit to Owner a list of the Subcontractors or

Suppliers proposed for the following portions of the Work: **Reference Appendices.**

If requested by Owner, such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, or other individual or entity. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder shall submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

- 12.04 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, or other individuals or entities. Declining to make requested substitutions will constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.06 of the General Conditions.

ARTICLE 13 – PREPARATION OF BID

- 13.01 The Bid Form is included with the Bidding Documents.

- A. All blanks on the Bid Form shall be completed in ink and the Bid Form signed in ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
- B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

- 13.02 A Bid by a corporation shall be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation shall be shown.

- 13.03 A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.

- 13.04 A Bid by an individual shall show the Bidder's name and official address.

- 13.05 A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.

- 13.06 All names shall be printed in ink below the signatures.

- 13.07 The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.

- 13.08 Postal and e-mail addresses and telephone number for communications regarding the Bid shall be shown.
- 13.09 The Bid shall contain evidence of Bidder's authority and qualification to do business in the state where the Project is located, or Bidder shall covenant in writing to obtain such authority and qualification prior to award of the Contract and attach such covenant to the Bid. Bidder's state contractor license number, shall also be shown on the Bid Form.
- 13.10 Execute, agree to and comply with the included RLF Contractor's Act of Assurance Form.
- 13.11 The project is subject to the tax requirements in accordance with State of Arkansas law and as set forth in the Supplementary Conditions.
- 13.12 Each bidder further certifies and agrees that, to the best of its knowledge and belief, it and/or its Officers or directors:
- A. Are in compliance with, and eligible to participate in this project pursuant to 40 CFR Sec. 32, Part C;
 - B. Are not presently debarred, suspended, proposed for debarment, declared ineligible, voluntarily excluded from participation by any department or agency of the federal government, or otherwise listed in the Excluded Parties List of the federal government;
 - C. Have not within a three (3) year period preceding this bid been convicted of or had a judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (federal, state, or local) transaction or contract under a public transaction; violation of federal or state antitrust statutes; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - D. Are not presently indicted or otherwise criminally or civilly charged by a government entity (federal, state, or local) with commission of any offenses enumerated in subparagraph C. above;
 - E. Have not within a three (3) year period preceding this bid had one or more public transactions (federal, state, or local) terminated for cause or default; and
 - F. Will require each subcontractor or other lower tier party with whom it contracts on this project to comply with the certifications of this paragraph, Article 13.
- 13.13 Each bidder agrees that:
- A. Through submission of a Bid, the bidder's supplier(s), subcontractor(s) or subcontractor's supplier(s) shall fully comply with the RLF Supplemental General Conditions, including but not limited to, the "American Iron and Steel" requirement, Labor Standards, Equal Employment Opportunity, and the "Prohibition on certain telecommunication and video surveillance services or equipment".

ARTICLE 14 – BASIS OF BID

14.01 *Bid Form*

- A. Bidders shall submit a Bid on the basis as set forth in the Bid Form.

ARTICLE 15 – SUBMITTAL OF BID

- 15.01 A Bid shall be received no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in a plainly marked package with the Project title:

**Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction
Malvern Water Works
Malvern, AR**

(and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to the **Malvern Water Works, 506 Overman St, Malvern, AR 72104.**

- 15.02 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 16 – MODIFICATION AND WITHDRAWAL OF BID

- 16.01 A Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 16.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 16.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 16.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 17 – OPENING OF BIDS

- 17.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 18 – BIDS TO REMAIN SUBJECT TO ACCEPTANCE

- 18.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 19 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 19.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, then the Owner will reject the Bid as nonresponsive; provided that Owner also reserves the right to waive all minor informalities not involving price, time, or changes in the Work.
- 19.02 If Owner awards the contract for the Work, such award shall be to the responsible Bidder submitting the lowest responsive Bid.
- 19.03 Evaluation of Bids
- A. In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.
 - B. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.
- 19.04 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.
- 19.05 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.
- 19.06 The party to whom the contract is Awarded will be required to execute the Agreement and obtain the performance Bond and payment Bond within ten calendar days from the date when Notice of Award is delivered to the Bidder.

ARTICLE 20 – BONDS AND INSURANCE

- 20.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to as to bonds and insurance. When the Successful Bidder delivers the Agreement (executed by Successful Bidder) to Owner, it shall be accompanied by the required Contract Security. Performance, Payment and Maintenance Bonds in the amount of one-hundred percent (100%) of the contract price with a Corporate Surety licensed in Arkansas and approved by the Owner and Engineer, will be required for the faithful performance of the contract, and the bidder shall state in the proposal the name and address of the Surety or Sureties who will sign this bond in case the contract is awarded to him
- A. Attorneys-in-fact who sign Bid Bond, Performance Bond, Payment Bond and Maintenance Bond must file with each Bond a certified and effective dated copy of their power of attorney.

- B. Executed Performance and Payment Bonds as well as proof of a Maintenance Bond guaranteeing the repair of all damage due to improper materials or workmanship for a period of 1 year after the acceptance of the work by the Owner will be required to be in place prior to execution of the Agreement. Maintenance Bond will not be fully executed until issuance of the Certificate of Substantial Completion.

ARTICLE 21 – SIGNING OF AGREEMENT

- 21.01 When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds and insurance documentation required to be delivered by the Contract Documents) to Owner. Within ten days thereafter, Owner shall deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

DOCUMENT 004100

BID FORM

MALVERN WATER WORKS

MANHOLE REHABILITATION FOR SANITARY SEWER OVERFLOW (SSO) REDUCTION

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ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

**Malvern Water Works
506 Overman Street
Malvern, AR 72104**

The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

- A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.

Addendum, Date

_____	_____
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
- C. Bidder has carefully carefully studied and agrees to complying with the RLF Supplemental General Conditions, City of Bryant Codes/ Ordinances, Union Pacific Railroad Company, or other provided documents provided in the appendices or referenced herein.
- D. Bidder has carefully study and agrees to complying requirements of Act 291 of 1993 concerning trenches or other excavations five feet deep or more in accordance with OSHA standards.
- E. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
- F. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions, if any, at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
- G. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations

obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

- H. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.
- I. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
- J. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.
- K. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.
- L. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

- A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;
- B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;
- C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and
- D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;
 - 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 - 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
 - 4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Bid Schedule					
Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction					
Malvern Water Works					
Malvern, AR					
Item No.	Description	Units	QTY	Unit Price	Item Total
1	Manhole Frame/Cover – Remove, Replace, Raise to Grade, Paved Areas (Group 1)	EA	15	\$	\$
2	Manhole Frame/Cover – Remove, Replace, Raise to Grade, Paved Areas (Group 2)	EA	20	\$	\$
3	Grout, Seal, and Waterproof Lower 18” of Manhole (Group 3)	EA	27	\$	\$
4	Install/Repair Internal Chimney Seal (Group 4)	EA	9	\$	\$
5	Seal and Waterproof Manhole with Cementitious Coating (Group 5)	VF	150	\$	\$
6	Repair/Construct Manhole Bench and Invert (Group 6)	EA	8	\$	\$
7	Complete Manhole Replacement (Group 7)	EA	7	\$	\$
8	Complete Manhole Rehabilitation (Group 8)	EA	1	\$	\$
9	Mobilization	Lump Sum			
10	Traffic Control	Lump Sum			\$
11	Manhole Acceptance Testing	Lump Sum			\$
12	Seeding, Sodding, & Final Cleanup	Lump Sum			\$
13	Trench & Excavation Safety	Lump Sum			\$
TOTAL BASE BID (Sum of Items 1 through 13)					
_____ dollars					
(In Words)					

Bidder acknowledges that each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item and inclusive of all tax requirements in accordance with State of Arkansas law.

All amounts and totals stated above (U.S. dollars) will be subject to verification by the Owner. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the

indicated sum of any column of figures and the correct sum therefore will be resolved in favor of the correct sum.

Quantities are not guaranteed. Final payment will be based on actual quantities.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within **90 calendar days** after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **120 calendar days** after the date when the Contract Times commence to run.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

- A. Required Bid security;
- B. Executed RLF Contractor's Act of Assurance Form;
- C. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids; and
- D. Arkansas Contractor's License No.: _____.

Within 5 calendar days of Owner's Request:

- E. Bidder's Qualification Statement with supporting data.
- F. A tabulation of subcontractors, suppliers and other persons and organizations required to be identified in this Bid.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

By: _____

[Signature] _____

[Printed name] _____

(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

Telephone Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

DOCUMENT 004313

BID BOND

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

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER:

**Malvern Water Works
506 Overman St
Malvern, Arkansas 72104**

BID

Bid Due Date:

Description: **Manhole Rehabilitation for
Sanitary Sewer Overflow (SSO) Reduction
Malvern, Arkansas**

BOND

Bond Number:

Date:

Penal sum _____ \$ _____
(Words) (Figures)

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

BIDDER

(Seal)

SURETY

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By:

Signature

By:

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____	Attest: _____
Signature	Signature
_____	_____
Title	Title

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.

2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.

3. This obligation shall be null and void if:

3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or

3.2 All Bids are rejected by Owner, or

3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).

4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.

5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.

6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.

7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.

8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

CONTRACTOR'S ACT OF ASSURANCE FORM

As the authorized agent of the individual, incorporation, or corporation (hereinafter referred to as the Contractor) bidding on or participating in a Revolving Loan Fund (RLF) financed project, I certify that I have read and understand the requirements of the RLF Supplemental General Conditions, and that the principles, agents and employees of the Contractor will comply with these requirements, including all relevant statutes and regulations issued pursuant thereto. As the authorized agent of the Contractor, I further certify that:

AMERICAN IRON AND STEEL I will comply with the 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 pursuant to this contract and the RLF Supplemental General Conditions. I understand that 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 I 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 detailed in the RLF Supplemental General Conditions.

EQUAL OPPORTUNITY I will comply with all requirements of 41 CFR Chapter 60 and Executive Orders 11246 and 11375, including inclusion of all required equal opportunity clauses in each subcontract awarded in excess of \$10,000, and will furnish a similar statement from each proposed subcontractor, when appropriate. I will also comply with all Equal Employment Opportunity requirements as defined by Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975; and Section 13 of the Federal Water Pollution Control Act Amendments of 1972 regarding sex discrimination.

NONSEGREGATED FACILITIES The Contractor that I represent does not and will not maintain any facilities provided for its employees in a segregated manner, or permit its employees to perform their services at any location under the Contractor's control where segregated facilities are maintained. I will also obtain a similar certification from each subcontractor prior to the award of any subcontract exceeding \$10,000 to said subcontractor, which is not exempt from the equal opportunity clause.

LABOR STANDARDS I will comply with the Labor Standards Provisions contained in Davis–Bacon wage rates specific to this contract and the RLF Supplemental General Conditions. I understand that the aggregate wage rates paid to any employees must equal or exceed the sum total of the base rate plus any listed fringe rate. I will furnish weekly payrolls and certifications as may be required by the Owner to affirm compliance. I will also require that weekly payrolls be submitted to the Owner for all Subcontracts.

OSHA REQUIREMENTS I will comply with the Department of Labor Occupational Safety and Health Administration (OSHA) Regulations promulgated under Section 107 of the Contract Work Hours and Safety Standard Act (40 U.S.C. 327-333) in performance of the contract.

PROCUREMENT PROHIBITIONS In compliance with Executive Order 11738, Section 306 of the Clean Air Act and Section 508 of the Clean Water Act, I certify that I will not procure goods and services from persons who have been convicted of violations of either law, if the facility that gave rise to said violations produces said goods or services.

PRESERVATION OF OPEN COMPETITION In accordance with Executive Order 13202 and its amendments, I certify that I have not discriminated against my employees or any subcontractor based upon labor affiliation or lack thereof.

RESPONSIBILITIES OF PARTICIPANTS REGARDING TRANSACTIONS (A.K.A. DEBARMENT AND SUSPENSION) I certify that I shall fully comply with Subpart C of 40 CFR Part 32, entitled "Responsibilities of Participants Regarding Transactions." I am responsible for ensuring that any lower tier covered transaction, as described in Subpart B of 40 CFR Part 32, entitled "Covered Transactions," includes a term or condition requiring compliance with Subpart C. I am responsible for further requiring the inclusion of a similar term or condition in any subsequent lower tier covered transactions. I acknowledge that failing to disclose the information required under 40 CFR 32.335 may result in the delay or negation of this assistance agreement, or pursuance of legal remedies, including suspension and debarment. I further acknowledge that I may access the Excluded Parties List System at <http://www.epls.gov>. This term and condition supersede EPA Form 5700-49, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters."

PROHIBITION ON CERTAIN TELECOMMUNICATION AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT I will comply with regulations at 2 CFR 200.216, designated as the "Prohibition on certain telecommunication and video surveillance services or equipment", implementing section 889 of Public Law 115-232 and repeated in the RLF Supplemental General Conditions. The regulation prohibits the use of federal funds to procure, enter into, extend, or renew contracts, or obtain equipment, systems, or services that use "covered telecommunications equipment or services" identified in the regulation as a substantial or essential component of any system, or as critical technology as part of any system. I understand that all products used in this contract will meet this requirement and that I will provide further verified information, certification or assurance of compliance with this paragraph, or information necessary to this prohibition as detailed in the RLF Supplemental General Conditions.

I understand that a false statement on this certification regarding any of the above certifications may subject the Contractor or Subcontractor to civil or criminal prosecution. I further certify that I will obtain a similar certification for each subcontract awarded.

AUTHORIZED AGENT

CONTRACTOR NAME: _____

ARKANSAS LICENSE NO. _____

SIGNATURE: _____

DATE: _____

PRINTED NAME: _____

TITLE: _____

DOCUMENT 005100
NOTICE OF AWARD

Date of Issuance:

Owner: **Malvern Water Works**

Owner's Contract No.:

Engineer: **Crist Engineers, Inc.**

Engineer's Project No.: **24052**

Project: **Manhole Rehabilitation for Sanitary
Sewer Overflow (SSO) Reduction**

Contract Name:

Bidder:

Bidder's

Address:

TO BIDDER:

You are notified that Owner has accepted your Bid dated
[] for the above Contract, and that you are the
Successful Bidder and are awarded a Contract for:

Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction

The Contract Price of the awarded Contract is: \$ []

Three (3) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award.

☒ a set of the Drawings will be delivered separately from other Contract Documents.

You must comply with the following conditions precedent within 10 calendar days of the date of receipt of this Notice of Award:

1. Deliver to Owner three (3) counterparts of the Agreement, fully executed by Bidder.
2. Deliver with the executed Agreement(s) the Contract security [e.g., *performance and payment bonds*] and insurance documentation as specified in the Instructions to Bidders and General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **Malvern Water Works**

_____ Authorized Signature

By: _____ Title: _____

Copy: **Crist Engineers, Inc.**

DOCUMENT 005213

AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT

THIS AGREEMENT is by and between the **Malvern Water Works** ("Owner") and

("Contractor").

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction

ARTICLE 2 – THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Replacement of 7 manholes and rehabilitation of 66 manholes including approximately 150 vertical feet of cementitious liner, repairs such as patching, grouting, sealing of pipe seals, replacement of manhole frames and covers, repair of manhole benches and troughs, and installation of chimney seals together with incidental and ancillary work.**

ARTICLE 3 – ENGINEER

- 3.01 The Project has been designed by **Crist Engineers, Inc.**
- 3.02 The Owner has retained **Crist Engineers, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

- 4.01 *Time of the Essence*
- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.
- 4.02 *Contract Times: Days*
- A. The Work will be substantially completed within **90 consecutive calendar days** after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within **120 consecutive calendar days** after the date when the Contract Times commence to run.

- B. Parts of the Work shall be substantially completed on or before the following Milestone(s):
[Not used]

4.03 *Liquidated Damages*

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with the Contract. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):
1. Substantial Completion: Contractor shall pay Owner **\$500** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified in Paragraph 4.02.A above for Substantial Completion until the Work is substantially complete.
 2. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$500** for each day that expires after such time until the Work is completed and ready for final payment.
 3. Liquidated damages for failing to timely attain Substantial Completion and final completion are not additive and will not be imposed concurrently.

ARTICLE 5 – CONTRACT PRICE

- 5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents the amounts that follow, subject to adjustment under the Contract:
- A. Total of Lump Sum Amount \$.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

- A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments

previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract

- a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

- A. Upon final completion and acceptance of the Work in accordance with Paragraph 15.06 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 15.06.

ARTICLE 7 – INTEREST

- 7.01 All amounts not paid when due shall bear interest at the rate of 10 percent per annum.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

- 8.01 In order to induce Owner to enter into this Contract, Contractor makes the following representations:
- A. Contractor has examined and carefully studied the Contract Documents, and any data and reference items identified in the Contract Documents.
 - B. Contractor has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - C. Contractor is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.
 - E. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance

of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (3) Contractor's safety precautions and programs.

- F. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
- G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
- J. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

- A. The Contract Documents consist of the following:
 - 1. This Agreement (pages 1 to 7, inclusive).
 - 2. Performance bond (pages 1 to 3, inclusive).
 - 3. Payment bond (pages 1 to 4, inclusive).
 - 4. Certificate of Insurance(s) (Provided by Contractor) (pages █ to █, inclusive)
 - 5. General Conditions (pages 1 to 72, inclusive).
 - 6. Supplementary Conditions (pages 1 to 24, inclusive).
 - 7. Revolving Loan Fund (RFL) Supplemental General Conditions (pages 1 to 86, inclusive)
 - 8. Specifications and Appendices as listed in the table of contents of the Project Manual.
 - 9. Drawings.
 - 10. Addenda (numbers ____ to ____, inclusive).
 - 11. Exhibits to this Agreement (enumerated as follows):
 - a. Contractor's Bid (pages 1 to ____, inclusive).
 - b. Executed RLF Contractor's Act of Assurance Form (pages 1 to 4, inclusive).
 - c. Certificate of Owner's Attorney Form (page 1 to 1, inclusive).
 - 12. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directive.

- c. Change Orders.
 - d. Payment Applications (including Claim or Invoice Affidavit).
 - e. Certificate of Substantial Completion.
 - f. Contractor's Release and Waiver of Lien.
- B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).
 - C. There are no Contract Documents other than those listed above in this Article 9.
 - D. The Contract Documents may only be amended, modified, or supplemented as provided in the General Conditions.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

- A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:
 - 1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

10.06 *Other Provisions*

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are based on EJCDC® C-700, Standard General Conditions for the Construction Contract, published by the Engineers Joint Contract Documents Committee®, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on _____ (which is the Effective Date of the Contract).

OWNER:

CONTRACTOR:

MALVERN WATER WORKS

By: _____

By: _____

Title: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Attest: _____

Title: _____

Title: _____

Address for giving notices:

Address for giving notices:

Malvern Water Works

506 Overman St,

Malvern, Arkansas 72104

License No.: _____
(where applicable)

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

DOCUMENT 005500

NOTICE TO PROCEED

Owner:	Malvern Water Works	Owner's Contract No.:
Contractor:		Contractor's Project No.:
Engineer:	Crist Engineers, Inc.	Engineer's Project No: 24052
Project:	Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction	Contract Name:
		Effective Date of Contract:

TO CONTRACTOR:

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on [REDACTED]. *[see Paragraph 4.01 of the General Conditions]*

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work shall be done at the Site prior to such date. In accordance with the Agreement, the number of days to achieve Substantial Completion is 90 consecutive calendar days, and the number of days to achieve readiness for final payment is 120 consecutive calendar days.

Before starting any Work at the Site, Contractor must comply with the following:
[Note any access limitations, security procedures, or other restrictions]

Owner: **Malvern Water Works**

Authorized Signature

By: _____

Title: _____

Date Issued: _____

Copy: **Crist Engineers, Inc.**

DOCUMENT 006113

PERFORMANCE BOND

CONTRACTOR (*name and address*):

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

OWNER (*name and address*):

**City of Malvern
506 Overman St
Malvern, Arkansas 72104**

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*): **Manhole Rehabilitation for Sanitary Sewer
Overflow (SSO) Reduction
Malvern, Arkansas**

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction Contract*):

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 16

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal (seal)

Surety's Name and Corporate Seal (seal)

By: _____
Signature

By: _____
Signature (*attach power of attorney*)

Print Name

Print Name

Title

Attest: _____
Signature

Title

Attest: _____
Signature

Title

Title

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

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

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

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

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

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

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

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

Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

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

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

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

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

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

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

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

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to

enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

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

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

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

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

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

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

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

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

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

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

14. Definitions

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

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

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

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

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

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

16. Modifications to this Bond are as follows:

DOCUMENT 006114

PAYMENT BOND

CONTRACTOR (*name and address*):

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

OWNER (*name and address*):

**City of Malvern
506 Overman St
Malvern, Arkansas 72104**

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description (*name and location*): **Manhole Rehabilitation for Sanitary Sewer
Overflow (SSO) Reduction
Malvern, Arkansas**

BOND

Bond Number:

Date (*not earlier than the Effective Date of the Agreement of the Construction
Contract*):

Amount:

Modifications to this Bond Form: ☐ None ☐ See Paragraph 18

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

CONTRACTOR AS PRINCIPAL

SURETY

Contractor's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____
Signature

By: _____
Signature (*attach power of attorney*)

Print Name

Print Name

Title

Title

Attest:

Signature

Attest:

Signature

Title

Title

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

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.

- 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

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

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

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

Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

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

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

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

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

18. Modifications to this Bond are as follows:

**CERTIFICATE
of
OWNER'S ATTORNEY**

I, the undersigned, _____, the duly authorized and acting legal representative of City of Malvern, Arkansas, do hereby certify as follows:

I have examined the attached contract(s), insurance, and performance and payment bond(s), and I am of the opinion that each of the aforesaid agreements, once validly executed, constitutes a valid and legally binding obligation upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Name: _____

Date: _____

SECTION 006291

CLAIM OR INVOICE AFFIDAVIT FORM

STATE OF _____)
COUNTY OF _____) SS:

The undersigned Contractor, of lawful age, being first duly sworn, on oath says that this invoice, claim, or contract is true and correct. The affidavit further states that the work, services, or materials as shown by this invoice or claim have been completed or supplied in accordance with the plans, specifications, orders, or requests furnished to the affiant.

Affiant further states that (s)he has made no payment given or donated or agreed to pay money or any other thing of value to obtain the award for or modifications to the Construction Contract, either directly or indirectly, to any State, County, local, or any other political subdivision that included elected or appointed officials, officers or employees and including the Engineer or Resident Project Representative.

The undersigned Contractor, further states that the work, services, or materials for all invoices, previous or otherwise, have been correctly applied to the Project account and promptly made payment of all sums due to Subcontractors, Suppliers or any other Claimants for labor, materials, or equipment furnished for use in the performance of the Construction Contract. The Contractor agrees to defend, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment during the performance of the Construction Contract.

The undersigned Contractor, further states that the work, services or materials for all invoices, previous or otherwise, the Contractor's supplier(s), subcontractor(s) or subcontractor's supplier(s) has fully complied with the RFL Supplemental General Conditions, including but not limited to Disadvantaged, Minority and Women's Business (DBE/MBE/WBE) participation and reporting requirements as well as , the "American Iron and Steel" requirement, Labor Standards, Equal Employment Opportunity, and the "Prohibition on certain telecommunication and video surveillance services or equipment". The Contractor agrees to defend, indemnifies, and holds harmless the State, Owner, Engineer, and Resident Project Representative from civil or criminal prosecution for failure to adhere to the terms of the Construction Contract.

_____ Invoice Number (if applicable)	_____ Pay Application Number	_____ Invoice Amount
_____ Signature		
_____ Company Name (Print or Type)		
_____ Address		
_____ City, State, Zip Code		

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

_____, Notary Public

My commission Expires: _____

SECTION 006519

CONTRACTOR'S FINAL RELEASE AND WAIVER OF LIEN

STATE OF _____)
COUNTY OF _____) SS:

KNOW ALL MEN BY THESE PRESENTS, That

(Name of Contractor)

(Address of Contractor)

organized under the laws of the State of _____ and
authorized to transact business in the State of Arkansas, for good and valuable consideration,
the receipt and sufficiency of which is hereby acknowledged, the undersigned Contractor hereby
waives, discharges, and releases any and all liens, claims, and rights to liens against:

**City of Malvern
506 Overman St
Malvern, AR 72104**

hereinafter called Owner, pursuant to a written contract with the aforesaid Owner for the
construction of:

Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction

and any and all other property owned by or the title to which is in the name of the above-
referenced Owner and against any and all funds of the Owner appropriated or available for the
construction of said Project, and any and all warrants drawn upon or issued against any such
funds or monies, which the undersigned Contractor may have or may hereafter acquire or
possess as a result of the furnishing of labor, materials, and/or equipment, and the performance
of Work by the Contractor on or in connection with said Project, whether under and pursuant to
the above-mentioned written contract between the Contractor and the Owner pertaining to said
Project or otherwise, and which said liens, claims or rights of lien may arise and exist.

The undersigned Contractor further hereby acknowledges that the sum of:

_____ Dollars (\$_____)

constitutes the entire unpaid balance due the undersigned Contractor in connection with said Project whether under said contract or otherwise and that the payment of said sum to the Contractor will constitute payment in full and will fully satisfy any and all liens, claims, and demands which the Contractor may have or assert against the Owner in connection with said contract or Project.

Signature

Company Name (Print or Type)

Address

City, State, Zip Code

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

Notary Public

My Commission Expires:

NOTE: This form is to be submitted with the Application for Final Payment. Claim or Invoice Affidavit to Accompany this form.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:*
1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:*
1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:*
1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

- A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Initial Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
 - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

- c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after

becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - c. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk:* Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and

guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

- C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 "Or Equals"

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
 - D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
 - E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
 - F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *Safety Representative*

- A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or

exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to

provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. *Samples:*

- a. Contractor shall submit the number of Samples required in the Specifications.
- b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
- B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 2. normal wear and tear under normal usage.
- C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 1. observations by Engineer;
 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. use or occupancy of the Work or any part thereof by Owner;
 5. any review and approval of a Shop Drawing or Sample submittal;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.
- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 *Delegation of Professional Design Services*

- A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
- B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop

Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

- C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
- D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during

or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.07 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
1. a mutually acceptable fixed fee; or
 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 Cost of the Work

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable

thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.
3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes

other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
- h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

- 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
- 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
- 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
- 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
- 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee:* When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.

E. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

- B. *Cash Allowances*: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will

include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments:*
1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.
 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

- a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
- a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
- a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

- 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
 - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount

remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

- A. *Application for Payment:*
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of

inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
- B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate For Convenience*

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for

expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 007300

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2013 Edition). All provisions that are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – TERMINOLOGY

SC-1.01 Add the following new paragraph immediately after Paragraph 1.01.48

49. Task - A single unit of Work or an action that is an essential component of a Project while serving to differentiate other various components of the Project.
50. Schedule of Tasks - A schedule, prepared, maintained and utilized by the Contractor, allocating various portions of the Work and used as a basis for reviewing Contractor's Progress Schedule and to assist in development of the Schedule of Values.
51. Critical Path - Tasks on the Progress Schedule that results in achieving Substantial Completion with the amount of time (days) identified in the Agreement.
52. Early Start Date - The earliest date the Task can begin.
53. Late Start Date - The latest date the Task can begin.
54. Early Finish Date - The earliest date the Task can be completed.
55. Late Finish Date - The latest date the Task can be completed.
56. Duration - The amount of time (days) a task takes to complete.
57. Float - The amount of time (days) a Task can be delayed from the Early Start Date without exceeding the date of Substantial Completion.
58. Total Float - The amount of time (days) between the Early Start Date and the Late Start Date for Critical Path Tasks unless the Late Start Date is

affected by the preceding or succeeding Task.

59. Free Float - The amount of time (days) between the Early Start Date and the Late Start Date for Tasks not identified on the Critical Path.

SC-1.01 Add the following new paragraph immediately after Paragraph 1.02.F

- G. Delay - A temporary suspension or impediment of all or a portion of the work required by the Contract. No delay may be found unless a Progress Schedule as required by the General Conditions has been submitted and accepted.

1. Excusable Delay. A delay caused by the acts of the Owner or an otherwise unforeseeable event beyond the Contractor's control which impacts on an element or elements of work, which are demonstrably critical to the progress and completion of the project. Except as provided in Section 7.06, acts of suppliers, fabricators or subcontractors are considered as under control of the Contractor and will not provide a basis for an excusable delay. An excusable delay will provide the basis for an extension of Contract Times.
 - i. Compensable. An excusable delay for which the Contractor may be entitled may be entitled to an extension or change of Contract Times and change to Contract Price.
 - ii. Noncompensable. An excusable delay for which the Contractor may be entitled to an extension or change of Contract Times but no change to Contract Price.
2. Nonexcusable Delay. A delay to the Contract or Milestone completion date for which no extension or change of Contract Times or change to Contract Price will be granted to the Contractor.

ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01 Delivery of Bonds and Evidence of Insurance

SC-2.01 Delete Paragraphs 2.01 B. and C. in their entirety and insert the following in their place:

- A. Evidence of Contractor's Insurance: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies of insurance (including all endorsements, and identification of applicable self-insured retentions and deductibles) required to be provided by Contractor in Article 6. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- B. Evidence of Owner's Insurance: After receipt from Contractor of the

executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner under Article 6 (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

SC-2.02 Copies of Documents

SC-2.02.A. Delete Paragraph 2.02.A in its entirety and insert the following in its place:

- A. Owner shall furnish to Contractor one (1) printed or hard copy of the Drawings and Project Manual and one set in Adobe (pdf) format. Additional copies will be furnished upon request at the cost of reproduction.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01 Add the following paragraph immediately after Paragraph 3.01.E:

- F. In the event there is a discrepancy between components of the project manual, the order of precedence, where applicable, shall be as follows:

Addenda (if issued), Supplemental Conditions (RLF provided in Appendix 1 or herein), General Conditions, Instructions to Bidders, Special Project Procedures, Technical Provisions.

- G. The Revolving Loan Fund (RLF) Supplemental General Conditions contained within Appendix 1 of the Contract documents, including Provisions 1 through 54, Appendices A through E, pages 1 through 86 shall be included and provided within these Contract Documents.
 - 1. Where discrepancies or conflict exist between RLF Supplemental General Conditions and other sections of the Contract Documents, the RLF Supplemental General Conditions shall govern except when other sections of the Contract Documents require higher standards than those of the RLF Supplemental General Conditions, then those other sections of the Contract Documents shall govern.
- H. The City of Malvern Codes/ Ordinances shall be included by reference within these Contract Documents. A copy may be viewed at the City of Malvern. A copy may also be viewed at:
https://library.municode.com/ar/malvern/codes/municipal_code
 - 1. Where discrepancies or conflict exist between City of Malvern Codes/ Ordinances and the technical specifications, the technical specifications shall govern except when City of

Malvern Codes/ Ordinances require higher standards than those of the technical specifications.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC-4.04 Add the following paragraph immediately after Paragraph 4.04.B:

- C. The Contractor's first Progress Schedule provided prior to commencement of Project Work must identify and include:
 - 1. Task
 - 2. Task of Schedules
 - 3. Critical Path
 - 4. Early Start Date
 - 5. Late Start Date
 - 6. Float
 - 7. Total Float
 - 8. Free Float
- D. The Contractor's subsequent Progress Schedules must identify and include all items provided in the first Progress Schedule plus the following to date items:
 - 1. Task Start and Completion Dates
 - 2. Added or subtracted Float
 - a. Float balance
 - 3. Added or subtracted Total Float
 - a. Total Float balance
 - 4. Added or subtracted Free Float
 - a. Free Float balance
- E. The Contractor's final Progress Schedule must identify and include all completed Tasks identified in the first and subsequent Progress Schedules plus:
 - 1. Total Float (final balance)

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC 5.06 Hazardous Environmental Conditions at Site

SC 5.06 Delete paragraphs 5.06.A and 5.06.B in their entirety and insert the

following:

A. No reports or drawings related to Hazardous Environmental Conditions at the Site are known to Owner.

B. Not used.

ARTICLE 6 – BONDS AND INSURANCE

SC-6.03 Contractor's Liability Insurance

SC 6.03 Add the following new paragraph immediately after Paragraph 6.03.J:

K. The limits of liability for the insurance required by Paragraph 6.03 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation, and related coverages under Paragraphs 6.03.A.1 and A.2 of the General Conditions:

State:	<u>Statutory</u>
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Federal, if applicable (e.g., Longshoreman's):	<u>Statutory</u>
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Jones Act coverage, if applicable:

Bodily injury by accident, each accident	\$ <u>500,000</u>
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Bodily injury by disease, aggregate	\$ <u>500,000</u>
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Employer's Liability:

Bodily injury, each accident	\$ <u>1,000,000</u>
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Bodily injury by disease, each employee	\$ <u>1,000,000</u>
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Bodily injury/disease aggregate	\$ <u>1,000,000</u>
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For work performed in monopolistic states, stop-gap liability coverage shall be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:

\$ <u>500,000</u>

Foreign voluntary worker compensation	<u>Statutory</u>
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2. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C of the General Conditions:

General Aggregate	\$ <u>2,000,000</u>
Products - Completed Operations Aggregate	\$ <u>1,000,000</u>
Personal and Advertising Injury	\$ <u>1,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>1,000,000</u>

3. Contractor's Commercial General Liability under Paragraphs 6.03.B and 6.03.C (for when active Work is being conducted, for the duration thereof, within the rights-of-way of the Railroad) of the General Conditions:

General Aggregate	\$ <u>6,000,000</u>
Products - Completed Operations Aggregate	\$ <u>2,000,000</u>
Personal and Advertising Injury	\$ <u>2,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>2,000,000</u>

4. Railroad Protective Liability under Section 6.03 of the General Conditions (for when active Work is being conducted, for the duration thereof, within the rights-of-way of the Railroad):

General Aggregate	\$ <u>6,000,000</u>
Products - Completed Operations Aggregate	\$ <u>2,000,000</u>
Personal and Advertising Injury	\$ <u>2,000,000</u>
Each Occurrence (Bodily Injury and Property Damage)	\$ <u>2,000,000</u>

5. Automobile Liability under Paragraph 6.03.D. of the General Conditions:

Bodily Injury:

Each person	\$ <u>1,000,000</u>
Each accident	\$ <u>1,000,000</u>

Property Damage:

Each accident	\$ <u>1,000,000</u>
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6. Excess or Umbrella Liability:

Per Occurrence	\$ <u>5,000,000</u>
General Aggregate	\$ <u>5,000,000</u>

7. Contractor's Pollution Liability:

Each Occurrence	\$ _____
General Aggregate	\$ _____

☒ If box is checked, Contractor is not required to provide Contractor's Pollution Liability insurance under this Contract

8. Contractor's Professional Liability:

Each Claim	\$ _____
Annual Aggregate	\$ _____

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC-7.02 Labor; Working Hours

SC-7.02.B. Add the following new subparagraphs immediately after Paragraph 7.02.B:

1. Regular working hours will be 7:00 AM to 7:00 PM

SC-7.02.B. Amend the first and second sentences of Paragraph 7.02.B to state "At the pre-construction conference, Contractor shall identify regular working hours for the project, as well as the anticipated schedule of work for Saturdays, Sundays, and/or legal holidays."

SC-7.02.C. Add the following new paragraph immediately after Paragraph 7.02.B:

The Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.02.D. Add the following new paragraph immediately after SC – 7.02.C:

If the Contractor wishes to work Federal Holidays and/or weekends and is not restricted to work those days by the Contract, it shall be the responsibility of the Contractor to submit a notice of intent to the RPR and/or Engineer two (2) days prior to the start of such work.

SC-7.12 Safety and Protection

SC-7.12 Insert the following after the second sentence of Paragraph 7.12.C:

SC-7.12.C The following Owner safety programs are applicable to the Work: here expressly identify by title and/or date, any such Owner safety programs.

SC-7.16 Shop Drawings and Samples

Add the following new paragraph immediately after Paragraph 7.16.A.1.d.:

- e. All shop drawings shall be checked and signed by the Contractor prior to submittal to the Engineer.
- f. Shop drawings submitted without contractor's signature or approval and verification will not be approved.

ARTICLE 8 – OTHER WORK AT THE SITE

SC-8.02 Coordination

SC-8.02 Delete Paragraph 8.02.A in its entirety and insert the following in its place:

- A. Owner intends to contract with others for the performance of other work at or adjacent to the Site.
 - 1. The Engineer shall have authority and responsibility for coordination of the various contractors and work forces at the Site;
 - 2. The following specific matters are to be covered by such authority and responsibility: None.

3. The extent of such authority and responsibilities is: Providing times and locations of work by others in relation to this Contract.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

SC-10.03 Project Representative

SC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.A:

- B. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
 1. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.
 2. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
 3. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
 4. Liaison:
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
 5. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract

Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

6. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
7. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
8. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
9. Inspections, Tests, and System Start-ups:
 - a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

10. Records:

- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

11. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

12. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

13. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.
14. Completion:
 - a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.
 - b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
 - c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

C. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
8. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.05 Change of Contract Times

Add the following new paragraphs immediately after Paragraph 11.05 B:

- A. The Engineer will furnish the Contractor a monthly statement showing the number of days charged to the Contract for the preceding period and the number of days specified for completion of the Contract. The Contractor will be allowed ten (10) days in which to file a separate written protest setting forth in what respect said statement is incorrect. If the Contractor fails to file separate written protest within the time specified, the Contractor waives all rights to protest that time charge. If the Contractor should fail, refuse, or neglect to sign the monthly statement of time charged and further should fail, refuse, or neglect to file a separate written protest of the time charges within the specified time, the Contractor waives all rights to protest the charges. It is hereby agreed and understood that a separate written protest of the time charges filed within ten (10) days as set forth herein is in all cases a condition precedent for the correction of the time charge.
- B. All requests for adjustment to Contract Times must identify delays actually encountered which interfered with Project work critical to timely completion of the Project work at a point in time when such work was scheduled to be in progress. Only a Contractor's Progress Schedule provided pursuant to 4.04 of the General Conditions, prior to commencement of Project work may be used to support the Contractor's request for additional Contract time or delay damages. No schedule prepared subsequent to commencement of Project work is acceptable for this purpose.
 - a. Excusable Delay - Compensable. Contract time allowed for performance of the work may be extended for delays caused by the Owner. Compensation may be paid only when completion of the delayed work element prevents the start of work on a successive work element and will adversely impact on Project completion. The Contractor may only be granted additional compensation in accordance with Section 11.04 of the General Conditions.
 - b. Excusable Delay - Noncompensable. Contract time allowed for the performance of the Work may be extended for delays caused by acts of God, acts of public enemy, fires, floods, strikes, freight embargoes, documented national, or regional material shortages which are industry wide, unusually severe or abnormal weather conditions, or epidemics/ pandemics or delays

not caused by the Contractor's fault or negligence. Delays necessitated by the compliance with certain federally mandated programs which occur after to submission of the Contractor's Bid may provide a basis for an excusable delay. No additional compensation shall be paid or due to the Contractor(s), Subcontractor(s) or Supplier(s) for excusable delay(s) arising from such delays.

- i. Epidemics/ Pandemics. The occurrence of epidemics/ pandemics during the life of the Contract will be considered a basis for extending Contract time when Work is not already suspended for other reasons. Epidemics/ pandemics delays arise when federal, state, county, municipal or other political subdivision, within the jurisdiction of the Project Location or the Supplier's, Subcontractor's or Contractor's place of business, with the legal authority to issue actions, including but not limited to, stay-at-home, shelter-in-place or other binding order(s). During these orders, the Contractor, Subcontractor(s) or Supplier(s) may be considered essential or non-essential business or activities. When the Contractor, Subcontractor(s) or Supplier(s) are considered essential and the actions of such binding orders do not demonstrate a delay(s) to the performance of the Contract, no excusable delay will be considered. When interstate or intrastate travel is known to be impacted prior to submission of the Contractor's Bid because of roadblocks or road closures, the Contractor and their subcontractor(s) and supplier(s) shall make all necessary arrangements to avoid such areas and no excusable delay will be considered. If impacts to intrastate or interstate travel are unavoidable, and the Contractor, Subcontractor(s) or Supplier(s) can demonstrate a delay(s), then the Contractor may provide basis for an excusable delay. All compliance activities associated with guidelines issued by with the federal Occupational Safety and Health Administration (OSHA), the Centers for Disease Control and Prevention (CDC) and the Department of Health and Human Services (HHS) (or the state or local subdivisions) prior to submission of the Contractor's Bid is pursuant to Section 7.12 of the General Conditions and is not considered an excusable delay. If revisions, updates or modifications are provided by OSHA, CDC or HHS, and the Contractor, Subcontractor(s) or Supplier(s) can demonstrate a delay(s), then the Contractor may provide basis for an excusable delay. Access or supply chain disruptions to necessary personal protective equipment (PPE), that is required to perform Work related activities specific to the Project, causing delay(s) may be considered an excusable delay. The Contractor, Subcontractor(s) and Supplier(s) will make all necessary accommodations for Work, (generation of submittals, pay applications, progress schedules, operations and maintenance manuals, etc.) that does not require physical presence at the Project,

manufacturing or fabrication site(s) to continue during issuance of binding orders. All other impacts arising from an Epidemics/ Pandemics, causing a delay(s) to the Contractor, Subcontractor(s) or Supplier(s) may be considered an excusable delay.

- ii. Unusually Severe Weather. The occurrence of unusually severe weather during the life of the Contract will be considered a basis for extending Contract time when Work is not already suspended for other reasons. Unusually severe weather means weather which, at the time of year it occurs, is unusual for the place in which it occurs.
- iii. Extensions of time for unusually severe weather will be determined on a monthly basis and will include only those actual adverse weather days in excess of the normal adverse weather days included in the Contract time. Normal adverse weather means adverse weather which, regardless of its severity, is to be reasonably expected for that particular place at that particular time of year. The normal adverse weather days included in the Contract time are based on historical records of temperature/ precipitation and are as shown in Table A.
- iv. Actual normal adverse weather days are those days meeting one or more of the criteria in “1”, “2”, “3” and “4” below. Time extensions for days meeting more than one criterion will take into consideration only that criteria having the greatest impact. Those actual normal adverse weather days covered by criteria “1”, “2” or “3” that are in excess of the days in Table A will be allowed without regard to when they occur (except prior to mobilization or during suspension for other reasons) or their impact on Contract completion. However, those days covered by criterion “4” will be subject to limitations as noted.
 - 1. Days with Maximum temperatures of +32 degrees Fahrenheit (0 degrees Celsius) or less - one full day allowed.
 - 2. Days with Minimum temperatures of +32 degrees Fahrenheit (0 degrees Celsius) or less, but whose Maximum temperature is over +32 degrees Fahrenheit (0 degrees Celsius) - one-half day allowed.
 - 3. Days when 1 inch (25.4 mm) or more precipitation (rain or snow equivalent) occurs - one full day allowed.
 - 4. Days when weather related conditions exist which prohibit proper performance of Work as specified - one full day allowed. Allowance of such days will be subject to the Work which is being delayed, being critical to timely Contract completion and the Contractor making every reasonable effort to minimize the adverse impact of the conditions.

5. The NOAA Weather Station **Malvern, AR US** located at Latitude/ Longitude: 34.3947, -92.8363 will be used to determine if the criteria in “1”, “2”, “3”.

Table A

Normal Adverse Weather Days Expected on a Monthly Basis (Included in Contract Time)	
Month	Days
January	16
February	11
March	6
April	4
May	4
June	4
July	4
August	4
September	4
October	5
November	6
December	12

- C. The number of days for performance allowed in the Contract as awarded is based on the original quantities as defined in Bid Form. If satisfactory fulfillment of the Contract required performance of Work in greater quantities than those set forth in the Proposal, the Contract time allowed for performance may be increased on a basis commensurate with the amount and difficulty of the added Work. If the Contractor finds it impossible, for reason beyond his/her control, to complete the Work within the Contract time as specified or as extended in accordance with the provisions of this Section, he/she may at any time prior to the expiration of the Contract time, as extended, make a written request to the Engineer for extensions or changes to Contract Times, setting forth therein the reasons which he/she believes will justify the granting of his/her request.
- i. To evaluate additional time, a Contractor may use scheduling methods described in 4.04 of the General Conditions.
1. Float, Total Float and Free Float time and corresponding balances in the scheduling of successive Work Tasks is a shared commodity by the Contractor and Owner.
- a. The Contractor shall utilize the corresponding remaining balances prior to seeking an extension or change of

Contract Times

- ii. Only additional Work or delays beyond the Contractor's control which affect the Critical Path, Milestone(s), or Substantial Completion will be considered for extensions or changes to Contract Times.
 - iii. The Contractor's plea that insufficient time was specified in the Proposal and the Contract or that previously unprotected time charges were incorrect shall not be grounds for extensions or changes to Contract Times.
 - iv. No change of Contract Price shall be allowed for Excusable Delay (Compensable or Noncompensable) for the use of Float, Total Float and Free Float time.
 - v. If it is determined that a change of Contract Times, Contract Price or both is justified, the Contract shall be modified by Change Order in accordance with Article 11 of the General Conditions.
 - vi. Daily time charges will cease when the Project is completed in accordance with Article 15 of the General Conditions.
- D. Notification of Delay. Within five (5) calendar days of the occurrence of a delay to the prosecution of the Work, the Contractor shall notify the Engineer in writing of such a delay and indicate that a request for delay consideration will be filed.
- E. Procedures Following Notification of Delay. After notifying the Engineer of the request for delay consideration, the Contractor shall keep daily records of all non-salaried labor, material costs, and equipment expenses for all operations that are affected by the delay.
- i. The Contractor shall maintain a daily record of each operation affected by the delay and the station location of the operations affected. Daily records of the affected operations' stations will also be maintained by the Owner. Each Monday, Contractor shall compare the previous week's daily records with the records kept by the Engineer. The Contractor shall also prepare and submit written reports to the Engineer containing the following information each Monday:
 - 1. Number of days behind schedule.
 - 2. A summary of all operations that have been delayed or will be delayed.
 - ii. In the case of a compensable delay, the Contractor shall explain how the Owner's act or omission delayed each operation and estimate the amount of time required to complete the project.

1. Contractor may request compensation for extra costs incurred as such costs are identified in Section 11.04 of the General Conditions.
 - iii. The Contractor shall provide written notice to the Engineer within ten (10) calendar days of the results of the comparison of the detailed reports performed each Monday and define any disagreements between specific records.
 - iv. Failure to meet to review the Engineer's records or to report disagreements between the records will be considered conclusive evidence that the Engineer's records are accurate. Delay costs allegedly incurred prior to notifying the Engineer that operations have been delayed will not be allowed.
- F. Procedures Following Completion of Work Alleged to be Delayed. Within fifteen (15) calendar days of Project completion, or phase of Work allegedly delayed, the Contractor shall submit a report to the Engineer containing the following information:
- i. A description of the operations that were delayed and the documentation and explanation of the reason for the delay, including all reports prepared for the Contractor by consultants, if utilized and;
 - ii. An as-built chart, updated progress schedule, or other graphic depiction of how the operations were delayed, and;
 - iii. An item by item measurement and explanation of extra costs requested for reimbursement due to the delay.
 - iv. The Engineer will review the data contained in the Contractor's report and the inspection diaries and records and reports available to him/her. A written decision will be provided to the Contractor within sixty (60) calendar days of the receipt of the Contractor's report which will contain notification of any additional time which may have been granted.
 - v. In the case of compensable delays, if it is determined that the Owner is responsible for delays to the Contractor's operation, the Engineer's written decision will identify the nature and extent of any delay and the compensation which may be due to the Contractor under the provisions of Section 11.04 of the General Conditions.

ARTICLE 12 – CLAIMS

SC-12.01 Claims

SC 12.01.D Add the following new subparagraph to Paragraph 12.01.D:

4. Mediation will be conducted in a location determined by the Owner.
5. Owner and Contractor shall each pay one-half of all costs associated with mediation, including fees and expenses incurred by the Engineer, RPR or other mutually agreed to parties arising out of mediation.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.03 Substantial Completion

SC 15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, shall be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

SC-17.01 Methods and Procedure

SC 17.01.C Add the following new paragraph immediately after paragraph 17.01.B

- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 12.01 shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
 - a. elects in writing to demand arbitration of the Claim, pursuant to Paragraph SC-17.02; or
 - b. agrees with the other party to submit the Claim to another dispute resolution process.

SC-17.02 Add the following new paragraph immediately after paragraph SC-17.01

SC-17.02 Arbitration

- A. All Claims or counterclaims, disputes, or other matters in question between Owner and Contractor arising out of or relating to the Contract Documents or the breach thereof (except for Claims which have been waived by the making or acceptance of final payment as provided by Article 15 including but not limited to those not resolved under the provisions of Paragraphs

- B. SC-17.01A and 17.01.B will be decided by arbitration in accordance with the rules of American Arbitration Association, subject to the conditions and limitations of this Paragraph SC-17.02. This agreement to arbitrate and any other agreement or consent to arbitrate entered into will be specifically enforceable under the prevailing law of any court having jurisdiction.
- C. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitrator or arbitration provider, and a copy will be sent to Engineer for information. The demand for arbitration will be made within the 30 day period specified in Paragraph SC-17.01.C, and in all other cases within a reasonable time after the Claim or counterclaim, dispute, or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such Claim or other dispute or matter in question would be barred by the applicable statute of limitations.
- D. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:
 - a. the inclusion of such other individual or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration; and
 - b. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings.
- E. The award rendered by the arbitrator(s) shall be consistent with the agreement of the parties, in writing, and include: (i) a concise breakdown of the award; (ii) a written explanation of the award specifically citing the Contract Document provisions deemed applicable and relied on in making the award.
- F. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Controlling Law relating to vacating or modifying an arbitral award.
- G. Owner and Contractor shall each pay one-half of all costs associated with arbitrators or arbitration service(s), including fees and expenses incurred by the Engineer, RPR or other mutually agreed to parties arising out of arbitration.

SC-17.03 Attorney's Fees

SC-17.03 Add the following new paragraph immediately after paragraph SC-17.02

- A. Attorney's Fees: For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorney's fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

End of Section

SECTION 010000

GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION AND SCOPE OF WORK

- A. The work included in this Contract consists of the furnishing of all tools, labor, equipment, materials, and supplies necessary to fully construct to the satisfaction of the Owner the Manhole Rehabilitation for Sanitary Sewer Overflow (SSO) Reduction together with all incidental and ancillary work as shown on the Drawings. Installation is to be complete and inclusive of materials, equipment, excavation, trenching, bedding material, backfill material, acceptance testing and quality control, traffic control, trench safety, and restoration of streets and property.
- B. Whenever in these Documents the word "Owner" appears, it shall be understood to mean the Malvern Water Works.
- C. Work or material not specifically mentioned in the Specifications, but designated on the Drawings, or forming an essential part of the Work mentioned or designated, shall be furnished and installed by the Contractor as though specifically mentioned.
- D. Construction of the work shall be by one General Contractor, utilizing Subcontractors for those specialties and portions of the Work that the General Contractor chooses to subcontract. All Subcontractors are subject to approval by the Owner in accordance with applicable sections of the General Conditions to these Specifications. The General Contractor shall maintain a responsible representative on-site whenever his subcontractors are on-site and engaged in the Work.
- E. All work shall be performed by the Contractor in a thorough and workmanlike manner, in full accordance with the Specifications by skilled and competent workmen well experienced in such construction methods and techniques.
- F. Any reference in these Specifications to an engineering standard (such as ASTM or AWWA) shall be to the latest version or edition as of the Bid Date.
- G. The Contractor shall not be permitted to sublet, sell or assign this contract or sublet any of the work to be performed hereunder without the written consent of the Owner and any such assignment or subletting of any such work without said consent shall be null and void and without force and effect. The Owner shall have the right to assign in whole or in part its rights hereunder.
- H. **All materials shall comply with the requirements, terms and conditions of Build America, Buy America (BABA) Act (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).**

1.2 COPIES OF DRAWINGS AND SPECIFICATIONS

- A. The Contractor will be provided sufficient copies of the Drawings and Specifications at no cost to the Contractor.

1.3 PERMIT(S)

- A. The Contractor shall be responsible for securing any required permit for the construction of the Project. Permits that may be required include but are not limited to Arkansas Department of Transportation (ARDOT), City of Malvern, and Arkansas Department of Environmental Quality Storm Water.

1.4 WRITTEN NOTICES

- A. Written notices, when required by the Contract Documents or for purposes of project administration, shall be mailed by Certified Mail, return receipt requested, as follows:
 - 1. If to the Owner: Malvern Water Works
Attn: Carl Wheatley, General Manager
506 Overman Street
Malvern, Arkansas 72104
 - 2. If to the Contractor: At the address as stated in the Agreement.

1.5 EXISTING UTILITIES AND SUBSURFACE STRUCTURES

- A. The construction work encompassed in this Contract will require excavation and related activity in close proximity to existing buried utility lines and subsurface structures (and some aerial facilities). The approximate location of such utilities and structures is shown on the Drawings, but all such utilities, structures, and individual service lines are not shown. The Contractor is to be aware of the potential for such buried utility lines and structures conflicting with his intended construction efforts, and use proper precautionary measures to locate, verify, and protect such buried lines and structures so as to avoid damage.
- B. The Contractor shall contact the owners of the various existing buried utility lines (or aerial facilities) and structures as impacted by his construction activities, and obtain their assistance in identifying, locating, and marking affected facilities prior to beginning any excavation which might endanger the existing facilities. The Contractor will bear all costs in connection with the location, marking, temporary protection, or support of such utility facilities. If such utilities are damaged or impaired due to the actions or omissions of the Contractor, then the Contractor is responsible for the cost of repairs or replacement of the affected or damaged utility lines.
- C. The Contractor shall make necessary exploratory excavations to determine the location of underground structures such as pipes, drains, conduits, and other structures.
- D. The Contractor shall provide adequate protection and support for all surface and subsurface structures or other facilities encountered during the progress of the work.
- E. The Contractor must comply with the ARKANSAS ONE-CALL (811) system, and alert the Utility Systems accordingly.
- F. The Contractor shall be responsible for any damage to the Owner's equipment and facilities resulting from Contractor's negligence. Contractor shall make immediate repairs to damages at his expense. In the event service has been disrupted, immediate repair operations shall be continuous and around the clock until complete, if necessary.
- G. If any utility facility or structure is damaged during the progress of the work, the Contractor shall immediately notify the appropriate owner. Repairs shall not be made by the Contractor without the prior approval of the utility facility or structure owner. The Contractor shall provide available assistance to the utility involved in making repairs

under emergency conditions.

1.6 SAFETY REQUIREMENTS

- A. Contractor shall be totally responsible for all necessary safety measures and precautions as stipulated in the General Conditions to these Specifications, and in compliance with the Occupational Safety and Health Administration's (OSHA) requirements applicable to the work of the various kinds as called for under this Contract. Particular attention is called to the Appendix of these Specifications pertinent to Excavation and Trench Safety.
- B. The Contractor shall be totally responsible for providing and maintaining any necessary and required barricades, signs, markers, shoring, bracing, etc. to provide for the protection of workmen and the Owner's personnel during the duration of the Work under this Contract.

1.7 ENVIRONMENTAL ASPECTS

- A. The work shall be planned and executed in full compliance with the requirements of the Federal Environmental Protection Agency (EPA), the Arkansas Department of Energy and Environment's Division of Environmental Quality (DEQ), and all local authorities.
- B. Dust Control: During periods of dry, dusty conditions at the construction site, the work shall be planned and executed so as to minimize dust problems. Contractor shall provide for watering of the construction site, haul roads, and any other disturbed areas to prevent excessive dust problems within the vicinity. Failure of the Contractor to provide adequate dust control shall be just cause for stopping all other work until the areas causing the dust have been watered and the dust controlled. Water for such dust control shall be provided by the Contractor.
- C. Noise Control: The work shall be planned and executed to minimize noise on the construction site. All applicable measures for noise control as required by OSHA standards shall be used.
- D. Burning: Logs, limbs, tops, stumps, roots and other debris may be burned in approved designated areas with the approval of all applicable local authorities, including the Fire Department having jurisdiction, and City of Malvern ordinances. All state and local laws pertaining to controlled burning must be followed. No burning shall occur in a maintained landscape. No scrap paper, cans, scrap pipe, etc. may be burned. If the Contractor is not allowed to burn the above-mentioned items, then all debris from clearing operations shall be hauled off site for disposal. Contractor will be responsible for disposal of all such debris in an approved disposal area.

1.8 STORM WATER PERMIT AND SILTATION CONTROL

- A. The work shall be so planned and executed so as to prevent siltation of area streams, ditches, swales, and drainages. Barriers, silt fences and filters shall be constructed as necessary by the Contractor to intercept and impede silt or debris laden runoff from the construction site and prevent excessive quantities of silt and debris from reaching area streams and drainages.
- B. Contractor shall complete for the Owner, all Storm Water Permit forms as required by the Department of Environmental Quality (DEQ). The Contractor shall submit all forms to the Owner for signature and forwarding to DEQ. The Contractor shall be responsible for any and all fees, notices, notice of intent, notice of termination, disclosure statements, storm water pollution prevention plan, etc. associated with obtaining the Storm Water Permit. Contractor shall prepare the storm water pollution prevention plan and send to the Owner

for signature and forwarding to ADEQ. Refer to Section 015713 Temporary Erosion and Sediment Control.

- C. Contractor shall be responsible for the cost of all claims, losses, fines, penalties, or damages charged to Owner due to Contractor's failure to comply with the requirements of the Storm Water Permit. If requested, Contractor shall provide copies of the storm water permit, notices, and storm water pollution prevention plan to the Owner.
- D. Contractor shall follow all requirements of the Storm Water Pollution Prevention Plan and Storm Water Permit. The Owner reserves the right to stop all work if the Storm Water Pollution Prevention Plan is not being properly implemented and followed and if the Storm Water Permit forms are not kept up to date by the Contractor.

1.9 FLOW CONTROL AND BYPASS PUMPING

- A. When the flow of sewage in the sewer line and/or manhole under construction is above the maximum for proper execution of the work, flows shall be reduced to an acceptable level through plugging, blocking and bypass pumping of the flows.
- B. When the sewage flow is blocked or plugged, sufficient precautions shall be taken to protect the public health and protect sewer lines from damage. No sewage shall be allowed to backup into any homes or building. No sewage shall overflow any manhole, cleanout, or any other sewer access. Users upstream of the replacement area shall be able to use all of their water and sewer utilities without interruption. During any time when an active sewer is plugged or blocked, the Contractor shall observe the conditions upstream of the plug and be prepared to immediately start bypass pumping if needed.
- C. When bypass pumping is required, the Contractor shall provide the necessary pumps, conduits, and other equipment to divert the flow of sewage around the section in which work is to be performed. The bypass system shall be of sufficient capacity to handle existing flow plus additional rainfall induced flow. An additional stand-by pump shall be on-site in case of a pump failure.
- D. The Contractor shall properly operate and maintain any active bypass system. Pumps and equipment shall be continuously monitored by an employee capable of starting, stopping, refueling, and maintaining the pumps during the entire period for which bypass pumping is necessary. If pumping is required on a 24-hour basis, engines shall be equipped in a manner to keep noise to a minimum and within local required levels.
- E. Any pump operated by the Contractor which pulls sewage or any type of material out of a manhole or sewer shall discharge this material into another manhole or appropriate container. Under no circumstances shall this material be discharged, stored, or deposited on the ground, street, road, or open environment.
- F. The Contractor shall take appropriate steps to ensure that all pumps, piping, and hoses that carry sewage are protected from traffic.
- G. The Contractor shall be responsible for having sufficient pumping capacity on site in case of an emergency, i.e. a broken water line. Under no circumstances shall groundwater, surface water, drinking water, or any other water source other than sewage be discharged into the sanitary sewer collection system.
- H. Temporarily plugging a sewer line shall be approved by the Owner.

1.10 CONSTRUCTION CONTROL, LAYOUT, AND SCHEDULING

- A. All work shall be constructed in accordance with the Specifications. Elevations of existing ground, structures, and appurtenances, and existing utilities are believed to be reasonably correct as shown but are not guaranteed to be absolute and therefore are presented only as an approximation. Any error or apparent discrepancy in the data shown or omissions of data required for accurately locating the work shall be referred immediately to the Owner for interpretation or correction.
- B. The Contractor shall be responsible for resetting all property pins disturbed by construction activities. All survey work for replacing property markers shall be done by a Licensed Surveyor.
- C. The Contractor shall prosecute the construction of said work with due diligence and at such a rate and in such manner as in the opinion of the Owner is necessary for completion within a reasonable time. The Contractor shall not open up work to the prejudice of work already started and shall arrange its work and dispose of materials so as to insure the least possible interference and inconvenience to the property owners on or beside whose property the pipelines are being constructed or to the public where the pipelines lie in or near a public thoroughfare. Contractor shall employ such number of construction crews as are necessary to construct said project within the allotted time provided.

1.11 NORMAL PROJECT WORKING HOURS

- A. Normal project working hours for this project are Monday through Friday between the hours of 7:00 am and 7:00 pm. Work shall not be permitted on Saturday, Sunday, or any of the following holidays: New Years Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day, unless written permission is requested by the Contractor and approved by the Owner at least 48 hours prior to work taking place. The Owner will require that a representative of the Owner be present or available for work which occurs outside of the normal project working hours. The Contractor shall compensate the Owner for salary costs and expenses incurred by the Owner as a result of the Contractor choosing to work outside the normal project working hours.
- B. The Contractor shall compensate the Owner for the salary costs and expenses incurred as a result of the Contractor choosing to work outside the normal project working hours as follows:
 - 1. Labor costs multiplied by 3 plus expenses such as lodging, mileage, materials, meals, etc.
- C. The Contractor may perform clean-up work outside of regular hours with the approval of the Owner and Owner. Clean-up work shall be approved by the Owner at least 48 hours prior to work taking place.

1.12 APPLICATION FOR PAYMENT

- A. Submit an itemized list of quantities to the Owner utilizing Unit Prices and a schedule of values in Application for Payment.
- B. Pay Periods: Calendar Month.
- C. If requested, the Contractor shall submit to the Owner for review, a detailed schedule of construction progress indicating the sequence of work, time of starting and anticipated completion of each part, and any unusual or critical aspects of the construction

scheduling. The schedule shall include provisions for maintenance of traffic. Schedule may be of graphic form indicating time elements for the various portions of work. Revise and resubmit schedule as required.

1.13 CONFERENCES, PUBLIC MEETINGS AND NOTICES

- A. The Engineer will schedule a preconstruction conference after Notice of Award. Project progress meetings may be held periodically.
- B. Contractor shall be available to attend public meetings at the Engineer and Owner's request.
- C. Contractor shall prepare and deliver notices necessary for the performance of the Work. Contractor shall coordinate the content of the notice with the Owner. Every reasonable effort shall be made to distribute notices two (2) days prior to any Work, however, Owner will allow the Contractor to distribute notices up to a minimum of one day in advance of Work.
- D. Contractor may distribute notices up to a maximum of fourteen (14) days prior to Work. If conditions do not allow Work to be performed during this period, Contractor will redistribute notices. If redistribution of notices is required, Work may be performed within one (1) day of noticing.
- E. Contractor vehicles, equipment, and machinery shall have an identifying logo in a visible location. Any contractor employee working on-site shall wear an identification badge which shall include a photo, name, company, and role/title.

1.14 QUALITY ASSURANCE

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.
- B. Comply fully with manufacturer's instructions.
- C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- D. The Contractor shall supervise and direct the Work. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor shall employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work. The Owner shall have the right at all times to require the removal of any superintendent, foreman, or workman for performing inferior work.

- E. Should any work be performed by the Contractor without giving notice of plan of work and opportunity of inspection by the Owner or his representative, the Owner may require the Contractor to uncover such work at his own expense for examination by the Owner. The cost of uncovering such work shall be the responsibility of the Contractor, whether or not the work is found acceptable. The work shall be subject to inspection by other appropriate ARDOT, City, County, State, Federal or other governmental inspectors at all times.
- F. The methods, equipment, and appliances shall produce a satisfactory quality of work and shall be adequate to maintain the schedule of progress. The Contractor shall maintain all equipment in good repair to ensure efficient performance of the work required. The Owner shall have the right to require the removal and/or replacement of any equipment which he deems incapable of satisfactory performance.

1.15 MAINTENANCE OF TRAFFIC

- A. The Contractor shall maintain traffic and protect the public from all damage to persons and property in accordance with all applicable State, City, and County regulations. Contractor shall conduct his operations so as to maintain and protect access, for vehicle and pedestrian traffic, to and from all properties adjoining or adjacent to those streets affected by his operations, and to subject the public to a minimum of delay and inconvenience.
- B. Suitable signs, barricades, danger lights, etc., shall be erected and the work outlined by adequate lighting at night in order to protect persons from injury and avoid property damage. The Contractor shall provide qualified flagmen to direct traffic while working upon a highway, street, or road over which traffic must pass.
- C. Traffic shall be detoured as required; however, no traffic shall be detoured without prior knowledge and approval of the traffic control agency having jurisdiction. Contractor shall notify the Owner at least 24 hours in advance of the time he proposes to detour traffic. No street shall be completely blocked, nor blocked more than one-half at any time without specific authorization. Any pavement markings damaged during the Work shall be removed and replaced promptly by the Contractor.
- D. Traffic control shall be in accordance with City of Malvern, Hot Spring County regulations, and/or the Arkansas Department of Transportation. Traffic control shall be in accordance with the agency having jurisdiction within the area of work.
- E. Closing streets with one access route shall not be acceptable or permitted. One traffic lane shall remain open at any given time. Excavated areas within the traffic lanes of highways, streets, roads, and pedestrian walkways shall be backfilled as soon as possible and the area reopened to traffic.
- F. The Contractor shall be responsible for making provisions for the safe and free passage of persons and vehicles by, over, or around the work while it is in progress. Such provisions or traffic control plans shall be satisfactory with the Owner, State, County, and Local authority having jurisdiction within the area of work.
- G. The Contractor shall make the same provisions as described above for the passage of vehicular and pedestrian traffic between private property and public highways, streets, and roads that are satisfactory to the Owner and private property owners involved.

1.16 USE OF COMPLETED PORTIONS

- A. The Owner may take possession of and utilize certain elements of the project as they are completed and placed into operation by the Contractor. The Contractor shall allow the Owner use of completed portions of the Work as necessary to maintain an effective system. Contractor shall plan the Work accordingly, in close coordination with the Owner so as to maintain all vital system operations.
- B. For Warranty purposes, the warranty period as called for by the General and Supplemental General Conditions to the Specifications will start upon substantial completion of the entire project.

1.17 REFERENCES

- A. Conform to reference standard by date of issue current as of date of Contract.
- B. The applicable codes and standards referred to in these specifications shall establish minimum requirements for materials, equipment, and installation, except where more stringent requirements are called for on the Drawings or elsewhere in the Contract Documents. Any conflict between the referenced codes and standards and the Drawings and Specifications shall be resolved by the Owner, whose decision shall be binding upon all parties. All codes and standards referenced shall be the latest revision at the time of bidding.

1.18 TEMPORARY ELECTRIC POWER

- A. Contractor shall provide and pay for power services required from source.

1.19 TEMPORARY WATER

- A. The Malvern Water Works is the Owner of the potable water distribution system in the area. The Contractor shall contact the Malvern Water Works for any water that is required and/or necessary during construction.
- B. The Contractor shall connect to the Malvern water distribution system in accordance with all requirements of the Malvern Water Works. The Contractor shall install a backflow prevention device and meter as required by the Malvern Water Works.
- C. The Contractor shall be responsible for any fees and water use charges as may be charged to the Contractor by the Malvern Water Works.
- D. **The Contractor shall not use individual homeowners or business utilities, including water, for construction activities.**

1.20 SANITARY FACILITIES

- A. Contractor shall provide and maintain required sanitary facilities and enclosures for the appropriate handling and disposal of all human waste, solid waste, and construction waste.
- B. Maintain clean and sanitary conditions.

1.21 TEMPORARY WATER CONTROL

- A. Maintain excavations and trenches free of water. Provide and operate pumping equipment of a capacity to control water flow.

- B. Provide dewatering system and pumping to maintain excavations dry and free of water inflow on a 24-hour basis.
- C. Provide piping to handle pumping outflow to discharge in a manner to avoid erosion or deposit of silt.

1.22 TEMPORARY ACCESS ROADS AND PARKING

- A. Construct and maintain temporary construction access roads, parking areas, and detours as are required to execute the Work.

1.23 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary erosion control construction, above grade or buried utilities, equipment, facilities, and materials, prior to Substantial Completion inspection.
- B. Remove and repair damage caused by installation or use of temporary work.

1.24 CONTRACT CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and Work is complete in accordance with Contract Documents and ready for Owner's inspection.
- B. Submit final Application for Payment identifying total adjusted Contract Price, previous payments, and amount remaining due.

1.25 CLEANING AND DISPOSAL

- A. Maintain areas free of waste materials, debris, rocks, roots, stumps, limbs, and rubbish. Maintain site in a clean and orderly condition. No trash shall be burned or buried on the job site and shall be properly disposed of by the Contractor.
- B. Execute final cleaning prior to final inspection.
- C. Drainageways, street surfaces and shoulders, driveways, lawns and landscaping, culverts, and all areas affected by construction shall be restored to equal or better than original condition. Ditches and drainageways shall be left clean and unobstructed and restored to their original cross-section and grade. Culverts shall be left "open" and free-flowing.

1.26 FENCE RESTORATION

- A. The Contractor shall be responsible for maintenance of fences during construction. The Contractor shall provide as necessary temporary fencing, gates, etc., as may be required to afford access to the construction site and maintain the full integrity of the fence.
- B. All fences disturbed by construction activity shall be restored to their original condition or better using fencing materials that are of the same size, metal gauge, and character as the original fence.

1.27 CHANGE ORDER PROCEDURES

- A. Submit itemized list of quantities and supporting data to Owner for preparation of change order.

1.28 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of Contract Documents, Shop drawings, and Product Submittals to be utilized for record documents.
- B. Record actual revisions to the Work concurrent with construction progress.
- C. Specifications, Record documents, and Shop Drawings: Legibly mark each item to record actual construction or product installed.
- D. Submit documents to Owner with final Application for Payment.

1.29 RESTORATION OF INFRASTRUCTURE, IMPROVEMENTS, STRUCTURES, ETC.

- A. The Contractor shall be responsible for repairing and/or replacing any public or private infrastructure, retaining walls, streets, drives, sidewalks, miscellaneous pavements, landscaping, sodding, brick pavers, fencing, irrigation systems, utilities, etc. damaged or disturbed by the Contractor during construction of the project.
- B. All improvements damaged or disturbed by construction activity shall be restored to their original condition or better using materials that are of the same size, metal gauge, lumber, and character as the original improvement and/or structure.
- C. Contractor shall take necessary precautions to prevent disturbance to private property. Contractor shall use plywood sheets or other method to prevent rutting caused by equipment in yards and other areas used for access. All areas disturbed by construction activity and access shall be sodded or seeded in accordance with specifications and as shown on the Drawings. Contractor shall repair any ruts caused by construction activity.
- D. All repair and replacement work shall be as approved by Engineer and/or Owner.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 012200

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 SECTION DESCRIPTION

- A. This Section stipulates the method of measurement and payment for items of Work for which Unit Prices and Lump Sum Prices are stated in the Bid Form.
- B. The bid item price shall include all Work, as required by the Contract Documents, to complete the specified manhole rehabilitation work listed on the Bid Form. The Work shall include all labor, materials, equipment, tools, and other such incidentals as required.
- C. All Work not specifically set forth as a pay item on the Bid Form or addressed herein, but nonetheless required for the complete and successful performance of the Work, shall be considered an obligation of the Contractor and subsidiary to the principle contract unit price for bid items requiring such materials and/or work. The cost of such subsidiary work shall be considered as included in the unit bid price required for the successful completion of the principle items of work indicated, and will not be paid outside of, or in addition to, the pay items shown on the Bid Form.

1.2 SCOPE OF PAYMENT

- A. Units of measurement of items of Work for which Unit and/or Lump Sum Prices are stated will be as herein subsequently defined.
- B. The estimated quantities for items of Work for which Unit Prices are given in the Bid Form are subject to variation, and payment shall be based upon the final measurement of the items of work actually successfully completed and accepted.

1.3 ESTIMATED QUANTITIES

- A. Quantities stipulated in the Bid Form or Contract Documents are approximate and are to be used only as a basis for estimating the probable cost of the Work and for comparing the bids submitted for the Work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities.
- B. Payments will be made, in accordance with the Contract Documents, for actual quantities utilized or installed, with said quantities being measured as specified herein. Each bid item will be measured and paid for by the units defined on the Bid Form, at the Item Unit Cost submitted and awarded.
- C. Contractor agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed, materials actually furnished, actual tools and equipment required and the estimated amounts thereof.

1.4 MEASUREMENT AND PAYMENT

- A. **Item No. 1 – Manhole Frame/Cover – Remove, Replace, Raise to Grade, Paved Areas (Group 1).** Manhole frames and covers (castings) removed, replaced, and raised (if necessary) and that are located in **paved areas** shall be measured and paid for by the units removed, replaced and raised to grade (if required) in paved areas as approved by the Engineer. Manholes identified for this work are as shown on the Manhole Rehabilitation Summary as Group 1. The unit price shall be inclusive of labor, materials, equipment, tools, removal of existing cover and frame, new standard manhole frame and cover, realignment, cleaning and preparation, root removal, sealants, grout, mortar, safety fencing, signage,

transportation, delivery, storage, notification, minor excavation and backfill, cleanup, proper disposal of waste materials, salvaging materials, inspections, pavement removal (saw-cutting) and repair, permitting and fees for street construction, pavement disposal and replacement, storm water pollution prevention, mobilization, and all other incidental items necessary for the complete removal and installation of new manhole covers, frames, and frame seals, at manholes located in **paved areas**, in accordance with the Contract Documents.

- B. **Item No. 2 – Manhole Frame/Cover - Remove, Replace Raise to Grade, Non-Paved Areas (Group 2).** Manhole frames and covers removed, replaced, and sealed at manholes located in **non-paved areas** shall be measured and paid for by the units removed, replaced and raised to grade (if required) in non-paved areas as approved by the Engineer. Manholes identified for this work are as shown on the Manhole Rehabilitation Summary as Group 2. The unit price shall be inclusive of labor, materials, equipment, tools, removal of existing cover and frame, new standard manhole frame and cover, realignment, cleaning and preparation, root removal, sealants, grout, mortar, safety fencing, signage, transportation, delivery, storage, notification, minor excavation and backfill, cleanup, proper disposal of waste materials, salvaging materials, inspections, pavement removal (saw-cutting) and repair, permitting and fees for street construction, pavement disposal and replacement, storm water pollution prevention, mobilization, and all other incidental items necessary for the complete removal and installation of new manhole covers, frames, and frame seals, at manholes located in **non-paved areas**, in accordance with the Contract Documents.
- C. **Item No. 3 – Grout, Seal and Waterproof Lower 18” of Manhole (Group 3).** Grouting, sealing and waterproofing the lower 18 inches of manholes, to stop infiltration and inflow, shall be measured and paid for as per each manhole where work is performed. Manholes identified for this work are shown on the Manhole Rehabilitation Summary as Group 3, and shall be paid for at the unit bid price on the Bid Form. The grouting, sealing and waterproofing of the “Lower 18” of Manhole” shall be measured vertically from the flowline of the effluent pipe. Work shall include grouting and sealing all areas in the lower 18” of the manhole including the bench, pipe seals, joints, etc. All areas in the lower 18” of the manhole shall be grouted, patched, and/or sealed to stop infiltration and inflow and to seal/fill voids around all penetrations. The unit price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, equipment, tools, supervision, cleaning, preparatory work, **remove and plug manhole steps in lower 18” of manhole**, removal of deteriorated substrate, root removal, sealants, grout, mortar, chemical grout (as required), plugging leaks (as required), safety fencing, signage, transportation, delivery, storage, notification, fence removal and replacement, cleanup, site restoration, bypass pumping, proper disposal of waste materials, testing/inspections (as required), storm water pollution prevention, and all other incidental items necessary for the complete rehabilitation of the lower 18 inches of manholes in accordance with the Contract Documents.
- D. **Item No. 4 – Repair/Construct Manhole Bench and Invert (Group 4).** Repairing/Constructing manhole benches to stop infiltration and inflow, and to repair substrate, shall be measured and paid for as per each manhole where this work is performed. Manholes identified for this work are as shown on the Manhole Rehabilitation Summary as Group 4. Repairing and constructing the manhole bench and invert shall include the repair, patching, grouting, and sealing process as required to stop infiltration and inflow, and to rebuild the manhole bench. The unit price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, equipment, tools, supervision, cleaning, preparatory work, removal of deteriorated substrate, root removal, sealants, grout, mortar, chemical grout (as required), plugging leaks (as required), safety fencing, signage, transportation, delivery, storage, notification, fence removal and replacement, cleanup, site restoration, bypass pumping, proper disposal of waste materials, testing/inspections (as required), storm water pollution prevention, and all other incidental items necessary to stop infiltration and inflow and reconstruct the bench in accordance with the Contract Documents.

- E. **Item No. 5 – Install Internal Chimney Seal (Group 5).** Installing internal manhole chimney seals, including all preparatory work and incidentals, shall be measured and paid for as per each manhole chimney where an internal seal is successfully applied. Manholes identified for this work are shown on the Manhole Rehabilitation Summary (Group 5). The “Chimney” shall be measured internally from the bottom of the frame to the top of the corbel. The unit price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, accessories, equipment, tools, supervision, cleaning, preparatory work, root removal, applied chimney sealant, primers, grout, mortar, chemical grouting (as required), plugging leaks (as required), safety fencing, signage, transportation, delivery, storage, notification, fence removal and replacement, cleanup, site restoration, bypass pumping (if required), proper disposal of waste materials, testing/inspections (as required), storm water pollution prevention, and all other incidental items necessary to successfully and completely install applied internal manhole chimney seals at manholes in accordance with the Contract Documents.
- F. **Item No. 6 – Seal and Waterproof Manhole with Cementitious Coating (Group 6).** Sealing and waterproofing of manholes with ½ inches of cementitious coating shall be measured and paid for as per vertical foot, as described herein. Manholes identified for this work are as shown on the Manhole Rehabilitation Summary as Group 6. Manhole depth shall be measured in vertical feet from the flowline of the effluent sewer pipeline to the top of the manhole rim, with measurements made to the nearest tenth (0.10) of a foot. This Bid Item includes work to line the entire inside surface of the manhole including the bench, walls, etc., to stop infiltration and inflow and to provide an acceptable substrate for coating, followed with the sealing and waterproofing of the entire inside surface with ½” of cementitious coating. The unit price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, equipment, tools, supervision, cleaning, preparatory work, root removal, removal of deteriorated substrate, sealants, coatings, grout, mortar, chemical grout (as required), plugging leaks (as required), **remove and plug manhole steps**, safety fencing, signage, transportation, delivery, storage, notification, fence removal and replacement, cleanup, site restoration, bypass pumping, proper disposal of waste materials, inspections (as required), liner application, storm water pollution prevention, and all other incidental items necessary to completely seal and waterproof manholes in accordance with the Contract Documents.
- G. **Item No. 7 – Complete Manhole Replacement (Group 7).** Removal of existing manholes and installation of new complete manholes in **paved or non-paved areas**, shall be measured and paid for as per each manhole removed and replaced, as described herein and as specified in Section 333913. Manholes identified for this work are shown on the Manhole Rehabilitation Summary as Group 7 and shall be paid for at the unit bid price on the Bid Form. Manhole depth shall be measured in vertical feet from the flowline of the effluent sewer pipeline to the top of the manhole corbel, with measurements made to the nearest tenth (0.10) of a foot. “Complete Manhole Replacement” is herein described as complete removal of the existing manholes and foundations, and the installation of a new foundation and manhole with new frames and covers, disconnection and reconnection of new or existing pipe penetrations, and all appurtenances and incidentals required for the complete removal and replacement of existing manholes, frames and covers, and foundations. The unit bid price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, equipment, tools, supervision, excavation, shoring, dewatering, bypass pumping, removal of existing manhole and foundation, installation of new manhole foundation and structure with new manhole frame and cover, disconnection and reconnection of manhole penetrations, grout, mortar, concrete, coatings, safety fencing, pavement removal (saw-cutting), permitting and fees for street construction, pavement disposal and replacement, signage, transportation, delivery, storage, salvaging materials, notification, cleanup, bypass pumping, backfill, proper disposal of waste materials, and all other incidental items necessary to completely and successfully remove existing and install new manholes in **paved or non-paved areas**, in accordance with the Contract Documents.

- H. **Item No. 8 – Complete Manhole Rehabilitation (Group 8).** Complete manhole rehabilitations located in **paved or non-paved areas** shall be measured and paid for as per vertical foot, as described herein. Manholes identified for this work are as shown on the Manhole Rehabilitation Summary as Group 8. Manhole depth shall be measured in vertical feet from the flowline of the effluent sewer pipeline to the top of the manhole rim, with measurements made to the nearest tenth (0.10) of a foot. This Bid Item includes work to line the entire inside surface of the manhole including the bench, walls, etc., to stop infiltration and inflow and to provide an acceptable substrate for coating, followed with the sealing and waterproofing of the entire inside surface with ½" of cementitious coating, followed by the application of a 100% solids epoxy (or polyurethane) as specified in 333961. The unit price shall be payment in full for performing and completing the work described and for furnishing all labor, materials, equipment, tools, supervision, cleaning, preparatory work, root removal, removal of deteriorated substrate, sealants, coatings, grout, mortar, chemical grout (as required), epoxy, polyurethane, plugging leaks (as required), **remove and plug manhole steps**, safety fencing, signage, transportation, delivery, storage, notification, fence removal and replacement, cleanup, site restoration, bypass pumping, proper disposal of waste materials, inspections (as required), liner application, storm water pollution prevention, and all other incidental items necessary to completely seal, waterproof, and coat manholes in accordance with the Contract Documents.
- I. **Item No. 9 – Mobilization.** Mobilization shall be paid for at the lump sum amount for the job requirement as stated in the Bid Form. The lump sum amount shall include preparatory work and operations necessary for movement of personnel, equipment, supplies, and incidentals to the project site; establishment of temporary offices, storage, buildings, sanitary facilities, and other facilities necessary to undertake the project; work or operations which must be performed, or for expenses incurred prior to beginning work on the project; bonds and insurance costs; and preconstruction costs not directly attributable to other pay items in this section. No additional payment shall be allowed for multiple mobilization operations, site visits, delivery, transportation, or other mobilization related activities, and shall be as required to provide a complete and functional system as required by the Contract Documents. A maximum of 60% of the total lump sum amount for this bid item will be paid in the first progress payment unless otherwise approved by engineer.
- J. **Item No. 10 – Traffic Control.** Traffic Control shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form. The lump sum amount shall include all labor, equipment, signs, barricades, traffic control plans, and other items necessary to provide traffic control in accordance with the Contract Documents. This lump sum amount shall be paid based upon the percentage of work that is completed.
- K. **Item No. 11 – Manhole Acceptance Testing.** Acceptance Testing of manholes shall be paid for at the lump sum amount for the job requirement as stated in the Bid Form as approved by the Engineer. The lump sum amount shall include all labor, tools, equipment, materials, sewer preparation, flow control and bypass pumping, cleanup, disposal of waste materials, storm water pollution prevention and all other work incidental and necessary to perform all acceptance testing in accordance with the Contract Documents.
- L. **Item No. 12 - Sodding, and Final Cleanup.** This item shall compensate the Contractor for establishment of grass by sodding in all disturbed areas. The lump sum amount shall include the cost of sod, equipment, finish grading, watering and all other work incidental thereto. This lump sum amount shall be paid based upon the percentage of sodding and cleanup that is completed.
- M. **Item No. 13 - Trench and Excavation Safety.** Excavation and trench safety systems shall be paid for at the stated lump sum amount for the job requirement as stated in the Bid Form. The lump sum amount shall include all labor, equipment, tools, storm water pollution prevention, mobilization, and materials necessary to comply with all safety standards in accordance with the Contract Documents and all Trench and Excavation Safety laws and regulations. This lump sum amount shall be paid based upon the percentage of work that is

completed.

PART 2 – PRODUCTS

A. Not used.

PART 3 – EXECUTION

A. Not used.

END OF SECTION

SECTION 013300

SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. No material or equipment shall be installed without the expressed permission of the Engineer.

1.2 SUBMITTAL PROCEDURES:

- A. Transmit each submittal with Engineer accepted form.
- B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor, Supplier, Manufacturer; pertinent drawing and detail number, and specification section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review (prior to submitting to Engineer), verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- F. Allow 15 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. Engineer will advise Contractor when a submittal being processed must be delayed for coordination. Time for review shall commence upon Engineer's receipt of submittal.
- G. Identify variations from contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for Contractor and Engineer review stamps.
- I. Revise and resubmit, identify all changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with provisions.
- K. Submittals not requested will not be recognized or processed.

1.3 SHOP DRAWINGS AND PRODUCT DATA:

- A. The Contractor shall provide Shop Drawings as may be necessary for the prosecution of the Work as required by the Contract Documents. The Engineer shall promptly review all shop Drawings. The Engineer's approval of any Shop Drawing shall not release the Contractor from responsibility for deviations from the Contract Documents. The approval

of any Shop Drawings which substantially deviates from the requirement of the Contract Documents shall be evidenced by a Change Order.

- B. Submit the number of reproductions which Contractor requires, plus three copies which will be retained by Engineer.
- C. Drawings, schedules, wiring diagrams, etc. shall show and list all features as specified, with any exceptions specifically noted.
- D. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

1.4 CONSTRUCTION PROGRESS SCHEDULE:

- A. Before work is started, the Contractor shall submit to the Engineer for review, a detailed schedule of construction progress indicating the sequence of work, time of starting and anticipated completion of each part, and any unusual or critical aspects of the construction scheduling. The schedule shall include provisions for maintenance of traffic. Schedule may be of graphic form indicating time elements for the various portions of work.

1.5 OPERATION AND MAINTENANCE MANUALS

- A. Unless otherwise specified, Contractor shall furnish three (3) complete sets of operation and maintenance manuals for the equipment furnished. Manuals shall include recommended startup procedures, operating procedures and precautions, and required maintenance procedures and schedules. Manual shall be specific for equipment actually furnished; all drawings, charts, photographs, and lists shall be specific in nature for the equipment actually furnished. General type submittals covering a variety of different models and sizes of equipment not actually furnished are not acceptable. Manuals shall be substantially bound of 8.5"x11" format with detailed table of contents and page numbers.

1.6 REPORTS AND RECORDS

- A. If requested, the Contractor shall submit to the Owner or Engineer quantities, payrolls, reports, estimates, records, and other data as may be requested concerning Work performed or to be performed.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 015713

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. In all respects during prosecution of the Work called for by the Contract Documents, Contractor shall minimize the discharge of stormwater pollutants from the construction activity.
- B. The work shall be planned and executed so as to prevent siltation of area streams, ditches, swales, and drainages.
- C. Barriers and filters shall be constructed as necessary by the Contractor to intercept and impede silt or debris laden runoff from the construction site and prevent excessive quantities of silt and debris from reaching area streams and drainages.
- D. If disturbed area is greater than 1 acre, the Contractor shall complete all required forms in order for the Owner to obtain a National Pollution Discharge Elimination System (NPDES) Storm Water Permit and the Contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for the project in accordance with Arkansas Department of Energy and Environment's Division of Environmental Quality (DEQ) regulations. The Contractor shall be responsible for all fees, notices, notice of intent, notice of termination, disclosure statements, etc. associated with obtaining the Storm Water Permit.
- E. If the disturbed area is less than 1 acre, the Notice of Coverage (NOC) and the SWPPP are not required. The Contractor shall prepare a drawing showing location and details of silt fences, barriers, etc. that the Contractor plans to install. The Contractor shall give the drawing to the Owner and Engineer for review. The Contractor shall follow Best Management Practices (BMP's) in accordance with DEQ requirements.
- F. If the disturbed area is less than 1 acre, the Contractor shall prepare a drawing showing location and details of silt fences, barriers, etc. that the Contractor plans to install. The Contractor shall give the drawing to the Owner and Engineer for review. The Contractor shall follow Best Management Practices in accordance with DEQ requirements.
- G. The Contractor shall be responsible for implementing the SWPPP (if a SWPPP is required by DEQ), maintenance of the SWPPP, conducting inspections, implementing best management practices, site posting, and responsible for plan amendments. Contractor shall be responsible for the cost of all claims, losses, fines, penalties, or damages charged to Owner or Engineer due to Contractor's failure to comply with the requirements of the NPDES Storm Water Permit.
- H. Contractor shall, on Owner/Operator's behalf, execute all applicable requirements and discharge all duties as may be required for this project as described in DEQ issued Construction General Permit titled "Authorization to Discharge Stormwater Under the National Pollutant Discharge Elimination system and the Arkansas Water and Air Pollution Control Act" including, but not limited to:
 - 1. Complete and post the NOC using forms acceptable to DEQ;
 - 2. Timely preparation of the SWPPP, using a format acceptable to DEQ;
 - 3. Ensuring that the site is in compliance with any changes or updates of the Permit;

4. Select, install, implement, and maintain best management practices at the construction site that minimize pollutants in stormwater discharges so as to meet applicable water quality standards;
 5. Provide qualified personnel to conduct inspections and prepare inspection reports;
 6. Maintain a file on site containing documents required by the SWPPP;
 7. Achieve final stabilization;
 8. Prepare and submit the NOT;
 9. Execute other requirements as may be required by DEQ and the Permit.
 10. The Contractor shall be responsible for all fees, notices, notice of intent, notice of termination, disclosure statements, etc. associated with obtaining the Storm Water Permit.
- I. The Contractor shall not begin construction before the Notice of Coverage (NOC) and SWPPP is posted at the construction site. According to current DEQ regulations, if the disturbed area is less than 1 acre the NOC and SWPPP are not required. If the disturbed area will be less than one acre, the Contractor shall submit a letter to the Owner stating such. The Contractor shall be required to use Best Management Practices if the disturbed area is less than one acre.

1.2 SECTION INCLUDES

- A. Temporary measures required to control erosion and sediment during construction. This includes measures to meet the requirements of the NPDES administered by the Environmental Protection Agency (EPA) and DEQ.
- B. Stabilized construction entrance.
- C. Silt fence.
- D. Rock Check/Sand Bag Dams
- E. Storm Water Pollution Prevention Plan (SWPPP).

1.3 REFERENCES

- A. ASTM D751--Coated Fences.
- B. ASTM D3786--Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics.
- C. ASTM A116--Zinc Coated (Galvanized) Steel Woven Wire Fence Fabric.
- D. ASTM D698--Test for Moisture Density Relations for Soils (Standard).

1.4 SUBMITTALS

- A. Submit in accordance with Section 013300 - Submittals.
- B. Submit the SWPPP.
- C. Product Data:
 1. Silt fencing.
 2. Non-woven filter fabric

- D. Inspection Reports and Certificates:
1. Submit periodic inspection reports and certificates required for SWPPP.
 2. Submit Contractor/Subcontractor certifications required for SWPPP.
- E. Submit revisions or modifications to the erosion and sediment control plan and SWPPP.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. **Hay bales shall not be used for check dams.** Hay may be used for temporary stabilization of areas when spread. Hay bales shall be free of seeds.
- B. Stone material shall consist of rip-rap conforming to Arkansas Department of Transportation Standard Specifications and shall be placed as shown or in a layer of at least 12 inches thick.
- C. Geotextile Fabrics shall be a non-woven polypropylene fabric designed specifically for use as a soil filtration media. Fabric shall have an approximate weight of 6 oz/yd², and shall conform to the following:

<u>Designation</u>	<u>Topic</u>	<u>Value</u>
ASTM D4632	Grab Strength (lbs.)	200
ASTM D4632	Grab Elongation	15%
ASTM D4533	Trapezoidal Tear (lbs.)	50
ASTM D751	Burst (psi)	320
ASTM D751	Puncture (psi)	80

ASTM D4751 Equivalent Opening Size (EOS) (mm)-soil retention.

<u>For Soils in Which:</u>	<u>EOS:</u>
50% or less passes a #200 mesh sieve	Greater than a #30 sieve
More than 50% passes a #200 mesh sieve	Greater than a #50 sieve

ASTM D4491 Permeability (k):

<u>For Soils in Which:</u>	<u>EOS:</u>
Critical/Severe:	k (fabric) >10k (soil)
Normal Applications:	k (fabric) >k (soil)

- D. Geotextile Silt Fence Fabric shall be a nylon reinforced polypropylene fabric having a reinforcing cord running the entire length to the top edge of the fabric. The fabric must meet or exceed the following criteria:

<u>Test Designation</u>	<u>Topic</u>	<u>Average Roll Minimum Value</u>
ASTM D4632	Grab Strength (lbs.)	90 lbs. @ 12"/minute
ASTM D4632	Grab Elongation	15% @ 12"/minute
ASTM D4751	Equivalent Opening Size (EOS)	U.S. sieve No. 20
ASTM D4491	Permittivity	>.01 sec.-1
ASTM D4355	U.V Resistance (500 hours exposure)	70%

- E. Fence Posts for Silt Fence shall be steel "T" posts of sufficient length to support the silt

fence system.

- F. Woven Wire Support for Silt Fence: W1.4, 4" x 4", zinc coated (galvanized) steel woven wire fabric conforming to ASTM A116.
- G. Corrugated Metal Pipe: 16 gauge helical wound galvanized corrugated metal pipe.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. The Contractor shall be responsible for reading and being thoroughly familiar with the permit and the storm water pollution prevention plan (SWPPP).
- B. The Contractor shall follow all requirements of DEQ Short Term Activity Authorizations and Corps of Engineers Permits.
- C. Locate and protect survey horizontal and vertical control.
- D. Contractor shall install silt fencing along the low side of clearing limits (minimum) and in other areas as necessary to prevent siltation of area streams, ditches, swales, and drainages.

3.2 MAINTENANCE

- A. Maintain erosion control devices as necessary to comply with the NPDES Storm Water Permit and Pollution Prevention Plan. This includes any revisions or modifications to the SWPPP. Any work required for modifications, revisions and maintenance shall be the responsibility of the Contractor and shall not be a basis for additional compensation.
- B. Maintain existing erosion and sedimentation control systems located within the project site.
- C. Inspect and repair or replace components of all erosion and sedimentation control systems as specified for each type of system. Unless otherwise directed, maintain the erosion and sedimentation control systems until the project is accepted by the Owner. Remove erosion and sedimentation control systems promptly when directed by the Owner. Discard removed materials off site.
- D. Equipment and vehicles shall be prohibited by the Contractor from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Damages caused by construction traffic to erosion and sedimentation control systems shall be repaired immediately.
- E. Remove and dispose of sediment deposits. Offsite disposal will be the responsibility of the Contractor. Sediment to be placed at the project site shall be spread, compacted and stabilized in accordance with the Owner's directions. Sediment shall not be allowed to flush into stream or drainage way. If sediment has been contaminated, it shall be disposed of in accordance with existing federal, state and local regulations.

- F. Unless otherwise indicated, compact embankments, excavations, and trenches by mechanically blading, tamping, and rolling soil in maximum 8-inch lifts. Compaction density shall be at a minimum of 90 percent Standard Proctor ASTM D-698 density. Protect embankments from erosion by grassing or other Owner approved methods.

3.3 TEMPORARY HAY BALE DIKE

- A. Temporary hay bale dikes shall not be used.
- B. Hay may be used for temporary stabilization of areas if spread.

3.4 CONSTRUCTION ENTRANCE

- A. When necessary, wheels must be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone (Type "A" rip-rap) which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch or watercourse using approved methods.

3.5 SILT FENCE

- A. Silt fences shall be constructed as needed and as required by the NPDES permit to prevent siltation of area streams, ditches, swales, and drainages.
- B. Silt fence shall consist of nylon reinforced polypropylene netting supported by woven wire mesh, W1.4 x W1.4 and galvanized steel posts set a minimum depth of 2 feet and spaced not more than 6 feet on center. A 6-inch wide trench is to be cut 8 inches deep at the toe of the fence on the uphill side to allow the fabric to be laid below the surface and backfilled. Fabric shall overlap at abutting ends a minimum of 3 feet, and shall be joined such that no leakage or bypass occurs. Remove accumulated sediment when the depth reaches 6 inches.

3.6 ROCK CHECK/ SAND BAG CHECK DAM

- A. Rock Check/Sand Bag Dams shall be constructed as needed and as required by the NPDES permit to reduce velocity in channels. Geotextile fabric shall be placed beneath the rock and shall conform to these specifications.

3.7 SEDIMENT BASIN WITH STONE AND PIPE OUTLET

- A. Provide sediment basins as needed and as required by the NPDES permit at locations as needed by Contractor's construction sequence and operations.
- B. Install stone and pipe outlets for sediment basin at location shown and/or located as needed by Contractor's construction sequence and as required by the NPDES permit.
- C. Inspect sediment basin after each rainfall, daily during periods of prolonged rainfall, and a minimum of once a week. Maintain basin dimensions necessary to obtain the needed basin volume. Repair and replace damaged components of the basin.

3.8 DIVERSION DIKE

- A. Diversion dikes shall be installed prior to and maintained for the duration of construction and shall intercept no more than five (5) acres of runoff. Dikes shall have a minimum top width of 2 feet and a minimum height of compacted fill of 18" measured from the top of the existing ground at the up-slope toe to top of the dike and having side slopes of 3:1 or flatter. The channel which is formed by the dike must have a minimum slope of one (1) percent for the entire length to an outlet. When the slope exceeds three (3) percent, or velocities exceed one foot per second (regardless of slope), stone stabilization is required. Plant grass on dikes not requiring stone stabilization.

END OF SECTION

SECTION 016000

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 TRANSPORTATION AND HANDLING

- A. Transport and handle products and equipment in accordance with manufacturer instructions.
- B. Promptly inspect shipments to ensure that products and equipment comply with requirements, quantities are correct, and that the items are not damaged.
- C. Provide equipment and personnel to handle products and equipment using methods to prevent soiling, disfigurement, or damage.

1.2 STORAGE AND PROTECTION

- A. Store and protect products and equipment in accordance with manufacturer instructions, with seals and labels intact and legible. Any special requirements as called for by the manufacturer of equipment for short or long term storage shall be strictly followed by the Contractor; that is, including, but not limited to, provisions for special protection, lubrication, moisture control and removal, shaft and bearing rotation and movement, and such.
- B. Store sensitive products and equipment in weather tight, climate controlled enclosures.
- C. For exterior storage of fabricated products and equipment, place on sloped supports, above ground.
- D. Provide off-site storage and protection when site does not permit on-site storage or protection. Off-site storage shall be approved by Engineer and Owner.
- E. Cover products and equipment subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of Product.
- F. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- G. Provide equipment and personnel to store products and equipment using methods to prevent soiling, disfigurement, or damage.
- H. Arrange storage of products and equipment to permit access for inspection. Periodically inspect to verify that items are not damaged and are maintained in acceptable conditions.
- I. Materials, supplies, and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.

1.3 SUBSTITUTIONS

- A. Engineer will consider requests for Substitutions only within 45 days after date established in Notice to Proceed.
- B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

- D. A request constitutes a representation that the Contractor:
1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 2. Will provide the same warranty for the Substitution as for the specified product.
 3. Will coordinate installation and make changes
 4. Waives claims for additional costs or time extension which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
1. Submit three (3) copies of request for Substitution for consideration. Limit each request to one proposed Substitution.
 2. Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.
 3. The Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 311100

CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 SUMMARY

- A. Contractor shall submit a plan to build access roads, trails, etc. to the Engineer for review and approval.
- B. Clear, grub, and prepare site as required by the Contract Documents and as necessary for access, stringing of pipeline materials, and construction of pipelines and appurtenant structures. The Contractor shall not remove or disturb any vegetation except that required for the execution of the work.
- C. Remove and dispose of all debris.
- D. Remove interfering or objectionable material from designated areas of Work.
- E. In areas of maintained lawns, Contractor shall import topsoil or strip the top 6 inches of surface material from areas which will be disturbed by construction activities and stockpile for finish grading and revegetation.
- F. Preserve vegetation and existing objects designated to remain from injury or defacement.
- G. Cut trees only at direction of Engineer. Refer to Section 311300 - Tree Protection and Trimming.
- H. Unless specified otherwise, the Contractor shall replace all vegetation, shrubs, bushes, trees (excluding woods), and flowers disturbed or removed that are located upon public or private property. At City of Malvern's direction and approval, bushes, trees, etc. that intrude upon City of Malvern's ability to access the sewer line or manhole shall not be replaced.
- I. Contractor shall only clear area necessary for construction. Maximum clearing shall be 5 feet either side of the pipe unless otherwise approved by Engineer.

1.2 DEFINITIONS

- A. Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal including down timber, snags, and brush larger than 2 inches in diameter and all rubbish, trash, and fencing in the areas to be cleared.
- B. Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots.
- C. Stripping shall consist of removing and stockpiling the top 6 inches of surface material from all areas which are disturbed by the construction operations. Stockpiled surface material will be used for finish grading.

1.3 SUBMITTALS

- A. All agreements between the Contractor and Property Owners shall be in writing and shall

be submitted to the Owner and Engineer.

1.4 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.
- C. Contractor to be responsible for providing access to Owner, Engineer, and others as required to travel along easement for reviewing construction progress.
- D. Do not commence site clearing until the easement boundaries are clearly established and verified.

PART 2 - MATERIALS

2.1 GENERAL

- A. Provide materials, suitable and in adequate quantity, required to accomplish Work of this Section.
- B. The Contractor shall replant vegetation and re-landscape or cause such to be performed throughout the work area as soon as possible after the pipe and appurtenances have been installed. All vegetation damaged by construction activities shall be replaced with healthy vegetation of the same kind or type. All plants shall be replanted in the original location.
- C. The Contractor shall maintain all such replanted vegetation by the application of water, fertilizers and topsoil. The vegetation shall be cultivated to prohibit the growth of foreign vegetation until a well-developed root system has been established and transplanted vegetation has overcome the "shock" resulting from transplanting. All vegetation which dies or becomes unhealthy shall be replaced by the Contractor at no additional cost to the Owner. The contour of the ground shall be left as near the original contour as possible.
- D. Prior to construction and sodding, vegetation that may interfere with operations shall be mowed, grubbed, and raked. The collected material shall be removed from the site. The surface shall be cleared of stumps, loose surface rocks, roots, cable, wire, and other materials that might hinder the work or subsequent maintenance.
- E. Remove trees, shrubs, brush, crops, and other vegetation within the limits of the easement (right-of-way), private property, or areas where work is to commence, as required. All efforts shall be made to retain existing landscaping. In the event that trees, shrubbery, hedges, and other landscaping cannot be saved, then prior approval from the property owner must be obtained before the existing landscaping can be removed. Provide Engineer with written authorization or agreements between the property owner and the Contractor, prior to work on the site.

- F. All trees shall be saved unless removal is approved by the property owner. Trim trees, as required, in accordance with Engineer's and property owner's instructions. Refer to specification Section 311300 "Tree Protection and Trimming".
- G. Shrubbery shall be saved unless removal is approved by the property owner. Contractor shall make reasonable efforts to save all shrubbery by trimming, in accordance with acceptable pruning practices, and treating wound surfaces with a commercial pruning compound.
- H. For small plants, flowers, or other landscaping vegetation, at least two weeks prior to the start of construction, Contractor shall notify the property owner of the proposed starting date so that the property owner can remove any small plants or flowers located within area of construction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Review with Engineer's representative the location, limits, and methods to be used prior to commencing Work under this Section. Entrance upon lands outside of that area provided by easements, licenses, agreements, permits, or public right-of-way, shall be at the Contractor's sole liability.
- B. Protect and maintain benchmarks and survey control points from disturbance during construction. In the event any markers, pins, or benchmarks are removed by the Contractor, such points shall be replaced at the Contractor's expense and shall be reset by competent surveyors properly licensed in Arkansas to do such work.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated.
- D. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Engineer and Owner.
- E. Exercise care when clearing near the clearing limits to avoid damage to existing trees, vegetation, structures, or utilities which are outside of the clearing limits.
- F. Protect, move, or brace public and private utilities, as required.
- G. Maintain mailboxes in the manner that the U.S. Postal Service requires in order to prevent interruption of mail delivery.
- H. Fences interfering with clearing, grubbing, or construction, and located within public rights-of-way or as may be allowed for in permits or agreements, may be removed only if the opening is provided with a temporary gate which will be maintained in a closed position except to permit passage of equipment and vehicles, unless otherwise directed. Fences within temporary construction easements may be removed provided that temporary fencing is installed in such a manner as to serve the purpose of the fencing removed.

- I. Fencing removed shall be restored to the condition existing prior to construction unless otherwise specified. The Contractor is solely liable for the straying of any animals, protected or corralled, or other damages caused by any fence removal.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- B. All areas impacted by site preparation activities shall be immediately seeded if trenching activities do not occur within 30 days.
- C. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 CLEARING AND GRUBBING

- A. Remove obstructions, trees, and shrubs to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Remove stumps, roots, obstructions, and debris extending to a minimum depth of 18 inches below exposed subgrade.

3.4 PRESERVATION OF TREES, SHRUBS, AND OTHER VEGETATION

- A. Refer to Section 311300 - Tree Protection and Trimming.

3.5 CLEARING AND GRUBBING LIMITS

- A. The limits of clearing and grubbing shall be those actually required by the contractor to accomplish the work in accordance with these specifications. Leave undisturbed all remaining portion of the easement whether permanent or temporary. Remove all trees damaged or killed during construction.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
- C. Clear and grub in stages. Avoid advancing clearing and grubbing unnecessarily too far in advance of pipe laying to reduce potential for erosion.

3.6 SAFETY AND PROTECTION

- A. Contractor shall be responsible for protecting public and private property and protecting any person or persons who might be injured as a result of the Contractor's work.
- B. Contractor shall be responsible for verifying locations of all utilities and contacting the Arkansas One Call System before excavating.

3.7 DISPOSAL OF CLEARING AND GRUBBING DEBRIS

- A. Haul the material from the Work site and dispose of in accordance with state, federal, and local laws. Off-site disposal shall be at the Contractor's sole expense.
- B. Do not leave material on the Project site, shove onto abutting private properties, or bury in embankments or trenches. If material is disposed onto adjoining private property with landowners agreement, such agreements shall be in writing and submitted to Engineer.
- C. Burning of clearing and grubbing debris shall not be permitted.

3.8 TOPSOIL AND SURFACE MATERIAL

- A. Imported topsoil may be substituted for stockpiling and replacing of surface material.
- B. In areas of maintained lawns, remove surface material to a depth of 6 inches for full width of the disturbed area and stockpile for finish grading.
- C. Stockpile surface material to one side and do not mix with other excavated material. Seed stockpiled material to prevent erosion, if stockpile not utilized within 30 days.
- D. Locate stockpiles so that material of one ownership is not transported and stockpiled on property of another ownership.
- E. Use equipment capable of removing a uniform depth of material.
- F. Use topsoil or stockpiled material for finish grading for minimum depth of 6 inches.

END OF SECTION

SECTION 311300

TREE PROTECTION AND TRIMMING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the protection and trimming of existing trees, shrubbery, and other vegetation that interferes with, or are affected by, execution of the Work, whether temporary or permanent construction.
- B. Cut and remove tree branches only where, in the opinion of the Engineer, that cutting is necessary to effect construction operation.
- C. Remove branches other than those required to affect the Work to provide a balanced appearance of any tree, as approved by property owner and Engineer prior to removal.
- D. Treat scars and wound surfaces resulting from the removal of branches or construction activities with an approved tree sealant.

1.2 SUBMITTALS

- A. All agreements between the Contractor and Land Owners shall be in writing and shall be submitted to the Owner and Engineer.

1.3 DEFINITIONS

- A. Tree Protection Zone: Area surrounding individual trees or groups of trees to remain during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 QUALITY ASSURANCE

- A. Tree Pruning Standard: Comply with ANSI A300 (Part 1), "Tree, Shrub, and Other Woody Plant Maintenance--Standard Practices (Pruning)."
- B. Before tree protection and trimming operations begin, meet with representatives of Owner and Engineer to review tree protection and trimming procedures and responsibilities.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Contractor shall take extra measures to protect trees, shrubbery, and other vegetation designated to be preserved, such as erecting barricades, trimming to prevent damage from construction equipment, and installing pipe and other work by means of hand excavation.
- B. Temporary Barrier: Install temporary barriers around tree protection zones if required to protect remaining trees and vegetation from construction damage. Maintain temporary

barrier and remove when construction is complete.

- C. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- D. Do not store construction materials, debris, or excavated material inside tree protection zones. Do not permit vehicles or foot traffic within tree protection zones; prevent soil compaction over root systems.
- E. Maintain tree protection zones free of weeds and trash.
- F. Do not allow fires within tree protection zones.
- G. Do not allow fires (if approved) from the site preparation activities to damage trees which are to remain.

3.2 EXCAVATION

- A. Do not excavate within tree protection zones, unless otherwise indicated.
- B. Where excavation for new construction is required within tree protection zones, minimize damage to root systems. Use hand digging, slick bore, or other method approved by Engineer.

3.3 REGRADING

- A. Maintain original grade around remaining trees.

3.4 TREE PRUNING

- A. Prune trees to allow for operation of construction equipment.
- B. Pruning Standards: Prune trees according to ANSI A300 (Part 1) and with Engineer and property owner's instructions.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Remove branches and dispose of off-site.
- E. Treat scars and wound surfaces resulting from the removal of branches with an approved tree sealant.

3.5 TREE REPAIR AND REMOVAL

- A. Downed trees and limbs will be the property of the Contractor unless removed from the easement by the property owner for his own purposes.
- B. Promptly repair trees damaged by construction operations within 24 hours.
- C. Repair damaged tree bark with an approved tree sealant.
- D. Remove trees to remain that die during construction operations and guarantee period, as a result of construction, when instructed by Engineer.

END OF SECTION

SECTION 312333

TRENCH EXCAVATION, BACKFILL, AND COMPACTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Excavating trenches for gravity sewer lines, manholes, service lines and incidental construction.
 - 2. Crushed granular stone backfill required by over-excavation or for trench stabilization.
 - 3. Pipe zone embedment material.
 - 4. Trench settlement repair, including roadway surfacing, sidewalks, or other structures.
 - 5. Replacing damaged culverts.
 - 6. Trench excavation and safety requirements
- B. Trench excavation is classified as common excavation and includes removal of material of whatever types encountered to depths shown or as directed by Engineer. There shall be no additional payment for rock excavation.
- C. Pipe zone includes full width of excavated trench from 6 inches below bottom of pipe to a point 6 inches above top outside surface of pipe barrel.
- D. Conform to federal, state, and local codes governing safe loading of trenches with excavated material. Refer to Trench Excavation Safety Rules and Recommendations as required by Act 291 of 1993.
- E. The right is reserved to modify the use, location, and quantities of the various types of backfill during construction as Engineer considers being in the best interest of Owner.
- F. The Contractor is responsible for disposal of excess excavated material off-site.
- G. Trench excavation, bedding and backfill shall be in full accordance with details on the Drawings.
- H. The Contractor shall comply with all requirements of any Arkansas Department of Environmental Quality Short-Term Activity Authorizations or Corps of Engineers Permits included in the Appendix of these Specifications. Contractor shall read and be thoroughly familiar with the Short- Term Activity Authorization requirements.
- I. Service lines shall be considered the same as sanitary sewer mains.

1.2 REFERENCES

- A. Arkansas Highway and Transportation Department, P.O. Box 2262, Little Rock, Arkansas 72203.
 - 1. AHTD 303 - Aggregate Base Course.
- B. American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

1. ASTM D448 - Classifications for Standard Sizes of Aggregate and Bridge Construction.
 2. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb. (2.49-kg.) Rammer and 12-inch (304.8-mm) Drop.
 3. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10-lb. (4.54-kg.) Rammer and 18-inch (457-mm) Drop.
 4. ASTM D2487- Classification of Soils for Engineering Purposes.
 5. ASTM D2922 - Test Methods for Density of Soils and Soil-Aggregates in Place by Nuclear Method.
- C. Occupational Safety and Health Administration (OSHA) Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P = Excavations.
- D. The Contractor shall be solely responsible for trench and excavation safety systems in accordance with Act 291 of 1993.
- E. American Water Works Association.
1. M41 - Ductile Iron Pipe and Fittings; Laying Conditions Type 2 and Type 3.

1.3 QUALITY CONTROL TESTING

- A. Contractor shall provide quality control testing if required by Engineer and Owner. Quality control testing may include classifications of aggregate sizes, density testing, moisture-density testing, etc.

PART 2 - PRODUCTS

2.1 FOUNDATION STABILIZATION MATERIAL

- A. Coarse natural gravel or crushed quarry rock (sandstone or granite), angular or rounded.
- B. Foundation stabilization material will be free from dirt, clay balls, or organic material.
- C. Uniformly graded from 6 inches to approximately 1 inch and no more than 10 percent by weight passing the #200 sieve size.
- D. Similar or equal to "B" stone as defined by ASTM (or certain quarry nomenclature) or Stone Backfill as defined by the AHTD Standard Specifications, current edition.
- E. Used to bridge over unacceptably soft and yielding soils through granular interlocking and friction forces between the particles. Not intended for direct contact with the pipe. Cover with pipe zone material as defined below.

2.2 PIPE ZONE MATERIAL FOR GRAVITY SEWER LINES

- A. Bedding and pipe zone material shall be in full accordance with details on the Drawings.
- B. Pipe zone material used for backfilling for gravity sewer lines shall consist of graded crushed stone (angular rock) with a size of 1/4-inch to 3/4-inch meeting the requirements of ASTM C33, gradation 67, commonly referred to as ASTM #67. Sand or Donafil is not permitted or acceptable.
- C. Pipe zone includes full width of excavated trench from 6 inches below bottom of pipe to a

point 6 inches above top outside surface of pipe barrel.

- D. Pipe zone material shall be approved by the Engineer and shall be free of trash, lumber, or other debris deemed unacceptable by the Engineer.
- E. Contractor shall include the use of granular pipe zone material for gravity sewer lines in the unit price for gravity sewer lines as stated in the Bid Form.
- F. Native soil shall not be used for pipe zone material for gravity sewer lines.

2.3 COMMON FILL MATERIALS

- A. All material placed in the trench from a point 8 inches above the crown of the pipe to the surface.
- B. Excavated spoil except no rock, stones or lumps larger than 8 inches in diameter.
- C. Excluded material includes roots, tree branches, refuse, trash, concrete, scrap metal, plastics, paper and any other deleterious material deemed unacceptable by the Engineer.

2.4 TRENCH BACKFILL UNDER PAVEMENT AND GRAVEL ROADS

- A. For trenches crossing roads, drives, streets, parking lots, and driveways, backfill shall be in accordance with the requirements of state, county, or local authority having jurisdiction, these specifications, and the Drawings.
- B. For trenches crossing asphalt and/or concrete paved streets, parking lots, and driveways, backfill shall consist of compacted crushed stone material throughout the depth of the trench and as shown on the Drawings.
- C. For trenches crossing gravel roads, gravel parking lots, and gravel driveways, backfill shall consist of compacted crushed stone material throughout the depth of the trench and as shown on the Drawings.
- D. Crushed stone material shall be in accordance with AHTD Class 7.
- E. Backfill shall be compacted with a vibratory compactor as approved by Engineer.

2.5 COMPACTION EQUIPMENT

- A. Vibratory compaction equipment, compaction wheel for bucket, or compaction bucket for compacting trench. Suitable type and adequate, as determined by the Engineer, to obtain the amount of compaction specified.
- B. Operate in strict accordance with manufacturer's instructions and recommendations and maintain conditions so that it delivers manufacturer's rated compactive effort.

2.6 FLOWABLE FILL (Controlled Low Strength Material)

- A. Flowable concrete fill shall have an unconfined compressive strength of 300 psi **maximum** to allow for future removal if necessary.
- B. The mixture shall consist of water, portland cement, fly ash, sound fine aggregate or coarse aggregate or both.
- C. The mix design shall allow adequate flowability without segregation of aggregates.

- D. The mix shall be adequate to be placed as shown on the Drawings.
- E. Hardening time is of prime importance and the mixture should develop 50 psi in approximately 1 hour.
- F. The maximum layer of thickness shall be 3 feet.
- G. Additional layers shall not be placed until the mixture has lost sufficient moisture.
- H. For pipelines or structures with a depth greater than 3 feet, the mixture shall be placed in lifts.
- I. Batching, mixing, and placement may begin when the temperature is 34 degrees F and rising and shall be terminated when the temperature is 40 degrees F and falling.

2.7 CONCRETE

- A. Concrete for manholes shall be in accordance with Section 333913 "Sanitary Sewer Manholes, Frames and Covers."
- B. Class "B" concrete for concrete encasement, pipe backing, piers, anchor collars and other uses shall be in accordance with Section 333100 "Sanitary Sewer (Gravity)."
- C. Concrete for "clay or concrete dams" shall be in accordance with Section 333100 "Sanitary Sewer (Gravity)."

2.8 IMPORTED SURFACE MATERIAL

- A. Suitable sandy loam from an approved source.
- B. Possess friability and a high degree of fertility.
- C. Free of clods, roots, gravel, rocks, and other inert material.
- D. Free of quackgrass, horsetail, and other noxious vegetation and seed.
- E. Acidity range (pH) of 5.5 to 7.5.
- F. Minimum of 4 percent and maximum of 50 percent organic matter.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Where clearing or partial clearing of right-of-way is necessary, complete prior to start of trenching. Refer to Section 311100 - Clearing and Grubbing.
- B. Do not permit excavated materials to cover brush or trees prior to disposal.

3.2 STRIPPING AND STOCKPILING OF SURFACE MATERIAL

- A. In areas of maintained lawns and within golf course property, remove surface material to a depth of 6 inches for full width of disturbed areas and stockpile or finish grading. Imported topsoil may be substituted for stockpiling and replacing of surface material.

3.3 TRENCH WIDTH

- A. Width of trench shall be adequate for the installation of the pipe and make-up joints, but in no case shall the width of the trench at the top of the pipe be wider than the outside diameter of the pipe plus two (2) feet. The minimum clear width of an unsupported or supported trench measured at the centerline of the pipe shall be at least 18-inches or the pipe outside diameter plus 12-inches, whichever is greater. Where embedment compaction is required, the trench shall be wide enough to accommodate the compaction equipment.
- B. Maximum width at top of trench shall be limited, especially where excess width of excavation would cause damage to adjacent structures, asphalt pavement, concrete pavement or property or cause undue stresses on the pipe.
- C. If necessary to prevent sliding and caving, cut the trench banks back on a slope above an elevation two feet above the outside top of the pipe to reduce the earth load on the trench sides. Do not exceed the maximum width until 2 feet above the outside top of the pipe.
- D. Confine trench widths to dedicated rights-of-way or construction easements, unless special written agreements have been made with affected property owner.

3.4 EXCAVATION

- A. Material excavated is defined as unclassified excavation regardless of the material encountered.
- B. All pipe shall be laid in trenches of such depth as to provide 36 inches of minimum cover over the top of the pipe barrel unless otherwise shown on the Drawings.
- C. Depth shall be increased as necessary for crossing other pipe lines, to provide for proper connection to existing lines and structures, and to provide required cover for valves and valve boxes. Depth shall be increased so as not to exceed the maximum permissible deflection joint as recommended by the pipe manufacturer.
- D. Excavate trench to lines and grades shown on the Drawings, or as established by Engineer, with proper allowance for pipe bells. The bottom of the trench shall be graded so that the pipe will be in continuous and uniform contact with and have a uniform bearing for the full length of the pipe.
- E. Trench preparation should proceed in advance of the pipe installation only as far as can be backfilled in the same day. The excavation of trenches shall not advance more than 100 feet ahead of the completed pipe work and backfill. All trenches and areas disturbed by construction activity shall be backfilled, settled, and the ground restored to its original condition as soon as possible after the pipe is installed. Any unnecessary delay in restoring trenches to their original condition shall constitute just cause for stopping all other work until the trenches are so restored.
- F. If trench is excavated below required grade whether due to instability of soils or other reason, the Contractor shall excavate below the lower extremity of the pipe as directed by the Engineer, and place a foundation stabilization material thoroughly in place to receive the pipe.
- G. Remove hard spots that would prevent a uniform thickness of bedding.
- H. Engineer may, if requested, allow changes in the trench alignment to avoid major

unforeseen obstructions, if such alignment changes can be made within the easement or right-of-way without adversely affecting the future operation and maintenance of the pipeline.

- I. Any excavation which remains open overnight shall be properly barricaded and lighted in accordance with OSHA standards to avoid injury to persons and property.

3.5 FLOWABLE FILL BACKFILL UNDER PAVED STREETS AND PARKING LOTS (If Required)

- A. If required or shown on the Drawings, excavations under existing asphalt or concrete paved streets, driveways, and parking lots shall be backfilled from the top of the pipe zone bedding material up to the pavement (in accordance with details on the Drawings) with flowable concrete fill from a minimum of one foot behind each curb or a minimum of three feet off the edge of the pavement, when there is no curb present. After the flowable concrete fill has cured asphalt/concrete shall be placed to match existing pavement.
- B. Flowable concrete fill shall be a material prepared in an established ready-mix concrete plant and delivered to the site in ready-mix transit trucks.
- C. Flowable concrete fill shall not be placed on frozen ground.
- D. Batching, mixing, and placement may begin when the temperature is 34 degrees F and rising and shall be terminated when the temperature is 40 degrees F and falling.

3.6 TRENCH EXCAVATION AND SAFETY

- A. Contractor shall be totally responsible for all necessary safety measures and precautions as stipulated in the General Conditions to these Specifications, and in compliance with the Occupational Safety and Health Administration's (OSHA) Excavation and Trenching Safety standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, and state (Act 291 of 1993) and local laws applicable to the work of the various kinds as called for under this Contract. The most stringent of these requirements shall apply. Particular attention is called to the Appendix of these Specifications pertinent to Excavation and Trench Safety.
- B. The Contractor shall be totally responsible for providing and maintaining any necessary and required barricades, signs, markers, shoring, bracing, etc. to provide for the protection of workmen and the Owner's personnel during the duration of the Work under this Contract.
- C. Sheet, shore and brace trench when necessary to prevent caving during excavation in unstable material or to protect adjacent structures, property, existing utilities, streets, workers, and the public.
- D. Increase trench widths accordingly by the thickness of the sheeting or trench box.
- E. Maintain sheeting or trench box in place until pipe has been placed and backfilled at pipe zone.
- F. Remove shoring and sheeting or trench box as backfilling is done in a manner that will not damage pipe or permit voids in backfill.

3.7 LOCATION OF EXCAVATED MATERIALS

- A. Place excavated material only within construction easement, or approved working area.

- B. Do not obstruct private or public traveled roadways or streets.
- C. Gutter, ditches and drainageways shall be kept clear or other satisfactory provisions shall be made for drainage.

3.8 REMOVAL OF WATER

- A. Provide and maintain ample means and devices (well pointing or over excavation and sump pumping) to promptly remove and dispose of water entering trench during time trench is being prepared for pipe laying, during laying of pipe, and until backfill at pipe zone is completed. Any dewatering method other than the two mentioned above shall be submitted to Engineer for approval.
- B. Dewatering of trenches shall be to the extent that pipe can be placed upon a dry and firm trench bottom. Pipe shall not be placed in a wet or unstable trench.
- C. Soil that cannot be dewatered shall be excavated to such a depth, as deemed necessary, to establish a firm subgrade.
- D. Divert surface runoff away from the excavation. Where the excavation crosses natural drainage channels, care should be taken to prevent unnecessary damage or delays. Route diverted surface water into existing drainage structures, such as storm sewers, ditches, or streams in accordance with ADEQ requirements.
- E. Dispose of water in a manner to prevent damage to adjacent property and to prevent flooding of public or private property.
- F. Dispose of water in accordance with all ADEQ requirements.
- G. Drainage of trench water through the pipeline under construction is prohibited.
- H. Trench water shall not be discharged into the sanitary sewer.

3.9 FOUNDATION STABILIZATION

- A. If trench is excavated below required grade whether due to instability of soils or other reason, the Contractor shall excavate below the lower extremity of the pipe as directed by the Engineer, and place foundation stabilization material thoroughly in place to receive the pipe.
- B. Backfill trench to subgrade of pipe base with foundation stabilization material.
- C. Place foundation stabilization material over the full width of trench and compact in layers not exceeding 6 inches deep to required grade by making passes with a vibratory compactor (or equivalent).
- D. Material shall be considered unsuitable when it contains more than 5 percent organic material by volumetric sampling or when it will not support a reading of 1.5 on a hand penetrometer or if deemed by the Engineer unable to adequately support the pipe.
- E. In areas where trench stabilization material is directed to be placed by the Engineer (or his representative) place pipe zone material on top to cushion the pipe and to prevent point bearing of the pipe on the trench stabilization material which may have sharp points.

3.10 ROCK IN TRENCH

- A. Do not allow pipe to be subjected to point bearing on rock anywhere along its length.
- B. No part of any bell or coupling shall be in contact with the trench bottom or trench walls when the pipe is jointed.
- C. Minimum Bedding Thickness: 6 inches.

3.11 PIPE ZONE BACKFILL

- A. Pipe zone backfill shall be in full accordance with details on the Drawings.
- B. Particular attention shall be given to area of pipe zone from flow line to centerline of pipe to ensure firm support is obtained to prevent lateral movement of pipe during final backfilling of pipe zone.
- C. Backfill from bottom of pipe to horizontal centerline (springline) of pipe by hand-placing material around pipe in 4-inch layers.
- D. Compact all pipe zone material to 90 percent of standard proctor density.
- E. Achieve continuous support beneath pipe haunches by "walking in" and slicing with shovel. Compact pipe zone material to 90 percent of standard proctor density.
- F. Backfill from horizontal centerline (springline) to 6 inches above crown of pipe with pipe zone material. Lightly compact.
- G. Pipe zone material shall be approved by the Engineer, and shall be free of trash, lumber, or other debris deemed unacceptable by the Engineer.
- H. Special attention shall be given to compactive efforts near ponds to prevent leakage from ponds.

3.12 TRENCH BACKFILL ABOVE PIPE ZONE

- A. From a plane 6-inches above the crown of the pipe to the ground surface as shown on the Drawings.
- B. Backfill shall be placed in a manner to avoid pipe damage. Do not push backfill into trench in a way to permit free fall of material until at least 2 feet of cover is provided over top of pipe.
- C. Under no circumstances allow sharp, heavy pieces of material to drop directly onto pipe or tamped material around pipe.
- D. Do not use backfill material of consolidated masses larger than ½ cubic foot.
- E. Use compaction equipment to obtain approximately 80 percent of standard proctor density on the backfill above the pipe zone up to the ground surface.
- F. Backfill of trenches shall be uniformly graded, conforming to adjacent natural ground or to required finished grade. In untraveled areas on private or public street or road rights-of-way, leave trench with backfill material neatly mounded not more than 6 inches above existing ground for entire width of trench. In lawn or garden areas, backfill trench and maintain it level with existing adjacent grade.

- G. Replace surface soil in top 6 inches.
- H. Excess or deficiency of backfill material which becomes apparent after settlement and within warranty period shall be corrected by regrading, disposal of excess material, and adding additional material where required.
- I. Remove rocks larger than 2 inches from upper 6 inches of backfill.
- J. Remove trash, construction debris, materials, brush, and other foreign objects.
- K. For trenches crossing paved streets, paved parking lots, gravel streets, gravel parking lots, and driveways:
 - 1. Backfill trench above pipe zone with ARDOT Class 7 crushed stone backfill material as specified in lifts not exceeding 8 inches loose depth in accordance with details on the Drawings.
 - 2. Compact each lift with mechanical vibrating or impact tampers. The entire trench to a point no less than 6 inches below existing paved or gravel subgrade and compacted to a minimum density of 90% modified proctor and the remaining 6 inches shall be similarly backfilled with a minimum density of 95% modified proctor.
 - 3. Maintain surface of backfilled trench level with existing grade with granular backfill material until entire Project is accepted by Owner.
 - 4. Subsequent settlement of finished surfacing during warranty period shall be considered to be a result of improper or insufficient compaction and shall be promptly repaired.
 - 5. Repair in accordance with details on the Drawings.
- L. Repair trenches crossing asphalt or concrete paved streets, parking lots and driveways in accordance with details on the Drawings.
- M. Special attention shall be given to compactive efforts near ponds to prevent leakage from ponds.

3.13 MANHOLE EXCAVATION

- A. Excavate the base area no larger than necessary to provide an adequate base.
- B. Dewater all excavations if required before starting any permanent construction.
- C. Provide sheeting and shoring as required.
- D. Leave at least twelve (12) inches between the outer surface of manholes and the excavation or shoring.
- E. If over excavation occurs, bring the excavation back to proper grade with either:
 - 1. Stone Backfill (B Stone) material compacted to 95% modified proctor; or,
 - 2. Concrete poured monolithically with the base.

3.14 BACKFILLING MANHOLES

- A. Do not backfill around manholes until adequate strength has been obtained from the manhole to support the backfill without damage to the manhole.
- B. Never backfill poured-in-place manholes until the concrete has cured 48 hours.

- C. Backfill manholes with select native material compacted to a density sufficient to prevent excessive settlement.
- D. In public streets or roads, backfill and compaction requirements shall be the same as for trench crossings.

3.15 MISCELLANEOUS STRUCTURES

- A. Excavate a sufficient distance from walls and footings to allow for forms and for proper inspection.
- B. Provide a minimum of 12-inches between the outer surface of miscellaneous structures and the excavation or shoring.

3.16 CLAY, CONCRETE, OR FLOWABLE CONCRETE FILL DAMS

- A. Clay, concrete, and/or flowable fill dams shall be in accordance with details shown on the Drawings.
- B. Clay, concrete, and/or flowable fill dams shall be constructed at the locations shown on the Drawings. Dams shall be constructed to control the migration of storm or groundwater along and into the sanitary sewer beyond the limits of the repair or rehabilitation.
- C. Hand excavate a minimum of six (6) inches around the outside of the existing sanitary sewer or sanitary service lateral and a minimum of six (6) inches into the trench wall along the existing pipe at each end of the repair trench. The hand excavated void around the existing pipe shall be filled with bentonite clay pellets and a form used to hold the clay pellets in place. The form may be left in place after backfilling and restoration. Concrete or flowable concrete fill may be used in lieu of bentonite clay.
- D. Concrete shall be in accordance with Part 2 above.
- E. Flowable concrete fill shall be in accordance with Part 2 above.

3.17 VACANT

3.18 EXCESS EXCAVATED MATERIAL

- A. Dispose of excess or unsuitable excavated material off project site in an approved area. **Do not leave rocks from excavation on ground surface.**
- B. Broken concrete, asphalt, and other debris resulting from pavement or sidewalk removal, excavated rock in excess of the amount permitted to be installed in trench backfill above the pipe zone, debris encountered in excavation work and other similar waste materials shall be suitably disposed of away from the site of the Work.
- C. If acceptable to the Owner (and the property owner from whom the easement for this pipeline has been obtained), excess earth from the excavation may be distributed directly over the trench and within the temporary easement to a maximum depth of 6 inches above the original ground surface elevation at or across the trench and sloping uniformly each way.
- D. Material thus wasted shall be carefully finished with a drag, blade machine, or other

suitable tool to a smooth, uniform surface without obstructing drainage as mentioned in subsequent articles of this specification.

- E. Wasting of excess material in the above manner will not be permitted where the line of trench crosses or is within a railroad, public road, or highway right of way or is within some other utilities pre-existing easement.
- F. The disposal of waste and excess excavated materials, including hauling, handling, grading, and surfacing, shall be incidental to the cost of the pipeline and no separate payment will be made therefore.
- G. Disposal of excess material shall only be allowed on private property with written permission of the owner of the property. A copy of the written permission must be provided to Owner and Engineer.

3.19 TEMPORARY CLEAN UP

- A. Contractor shall not leave trenches open overnight without approval of the Engineer. Contractor shall install temporary fencing around excavation at pipe end, at end of workday.
- B. Backfilling shall be a continuous operation. Contractor shall not have more than 100 feet of trench open at any given time.
- C. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.

3.20 DRAINAGE MAINTENANCE AND RESTORATION

- A. Bridges and other temporary structures required to maintain traffic across such unfilled trenches shall be constructed and maintained by the Contractor.
- B. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. All material deposited in roadway ditches or other watercourses crossed by the line of trench shall be removed immediately after backfilling is completed and the original section, grades, and contours of ditches or watercourses shall be restored. Surface drainage shall not be obstructed any longer than necessary and shall by no means be left obstructed overnight or for the weekend.
- C. Where indicated on Drawings, provide rip rap on ditch banks.

3.21 SETTLEMENT

- A. The Contractor shall be responsible for all settlement of backfills, fills, and embankments which may occur during the warranty period (one year) stipulated in the General Conditions.
- B. The Contractor shall refill trenches as often as necessary to bring them back to original grade.
- C. Where settlement occurs in streets, driveways, roads, parking areas, or other paved surfaces, the Contractor shall refill them frequently enough to maintain traffic without hazard at all times.

- D. The Contractor shall make or cause to be made, all repairs or replacements made necessary by the settlement within 7 days after notice by the Engineer or Owner.

3.22 USE OF EXPLOSIVES

- A. Explosives shall not be used unless approved by Engineer.
- B. In the event the use of explosives is necessary for the efficient prosecution of the work, the Contractor shall notify the Engineer, in advance, of their use and shall exercise every precaution to prevent damage to adjoining improvements or property by reason of their use.
- C. Any damage to property resulting from the use of explosives shall be the liability of the Contractor.
- D. In all cases where the use of explosives is necessary, a permit from the local governmental agency having jurisdiction shall be obtained prior to their use. The Contractor shall be responsible for obtaining all permits. Copies of permits shall be submitted to Engineer and the Contractor shall keep a copy of all permits on the job site at all times.
- E. All work pertaining to the use of explosives shall be performed by qualified personnel.
- F. Contractor shall follow all governing OSHA safety regulations.
- G. Contractor shall use a blasting shield or mat.

END OF SECTION

SECTION 320117

ASPHALT PAVEMENT REPAIR

PART 1 - GENERAL

1.1 SUMMARY

- A. Repair asphaltic concrete pavement disturbed during construction in accordance with this Section and details shown on the Drawings.
- B. Contractor shall comply with all requirements of county or city in which the work is being done and the Arkansas Department of Transportation (ARDOT).
- C. Contractor shall secure permits and inspections, post necessary bonds, and pay necessary fees.
- D. Where asphalt streets, driveways, or parking areas are disturbed during excavation, the surface shall be replaced as soon as practical after completion of backfilling so as to restore it to the original condition.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials, 444 North Capitol Street North West, Suite 249, Washington, DC 20001.
 - 1. AASHTO M82 - Standard Specification for Cut-Back Asphalt (Medium-Curing Type).
- B. American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.
 - 1. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³))
- C. Arkansas State Highway and Transportation Department, P.O. Box 2261, Little Rock, AR 72203.
 - 1. ARDOT - Standard Specifications for Highway Construction, Latest Edition.
 - 2. ARDOT 303 - Aggregate Base Course.
 - 3. ARDOT Division 400 - Asphalt Pavements
 - a. ARDOT 407 - Asphalt Concrete Hot Mix Surface Course

PART 2 - PRODUCTS

2.1 ASPHALTIC PAVING MATERIALS

- A. Base Coarse: Crushed stone conforming to ARDOT Standard Specifications for Highway Construction Section 303, Class 7.
- B. Prime Coat: Medium curing cut-back asphalt; MC-30 or MC-70; AASHTO M82; heated and applied within the temperature range 80 degrees F. - 150 degrees F.

- C. Hot-mix surfacing material shall meet the following requirements: Asphaltic Cement Hot Mix Surface Course ($\frac{1}{2}$ ") in accordance with Section 407 of the ARDOT Standard Specifications for Highway Construction.

2.2 REINFORCEMENT STEEL

- A. Reinforcement steel shall be in accordance with Specification Section 320129 "Concrete Pavement Repair".

PART 3 - EXECUTION

3.1 GENERAL

- A. Asphalt surfaces for pavements, streets, roads, driveways, parking lots and walks shall be repaired with hot mix asphalt. Asphalt thickness shall match adjacent pavement with a minimum thickness of 2-inches. The finished surface shall match and shall be level with surrounding pavement.
- B. Before replacing paved surfacing, the existing pavement shall be cut, sawed, or trimmed along straight and vertical lines along each side of the trench.
- C. Temporary repairs (if required) to paved surfaces shall be made with cold mix asphalt to allow access. Final repairs shall be made within 60 days weather permitting. Driveways shall be maintained to allow access during all weather conditions.

3.2 EXCAVATION AND BACKFILL

- A. Excavate and backfill in accordance with Specifications Section 312303 - Excavating, Backfilling, and Compacting for Pavement.

3.3 SUBGRADE PREPARATION

- A. Subgrade for asphalt paving improvements shall have organic silty and clayey topsoils and other unsuitable material removed and replaced with approved material.
- B. Fill and tamp traces of utility trenches.
- C. Replace soft spots as needed.

3.4 BASE COURSE FOR ASPHALTIC PAVING

- A. A concrete slab 6 inches in thickness and reinforced with #4 reinforcement bars placed at 12 inches on center each way shall be poured with the finished top of the slab extending to a point 2 inches below the finished surface. A bituminous tack coat shall then be applied to the concrete surface at a rate of 0.03 to 0.10 gallons per square yard. After proper curing of the tack coat, asphalt concrete hot mix surface course shall be placed with a compacted thickness of 2 inches and rolled with a steel wheeled roller to a minimum density of 92% of maximum density by Modified Proctor method.
- B. Place material on prepared subgrade in accordance with details shown on the Drawings.
 - 1. Spread base course the same day the material is hauled. It shall be thoroughly mixed, either by repeated handling with a blade grader or by harrowing sufficiently to secure a uniform mixture of coarse and fine particles.

2. Compact base course by systematically rolling and watering as required to obtain a firm, uniform, smooth surface as specified in Division 300 of AHTD Standard Specifications for Highway Construction. Base course shall be compacted in 8-inch lifts.

C. Minimum density shall be 95 Percent Standard Proctor (ASTM D698).

3.5 HOT-MIX SURFACING FOR ASPHALTIC PAVING

A. Plant Mixing and Transporting: Mixing, transportation, and temperature limitations for hot-mix surface course materials shall be in accordance with the requirements of Division 400, Asphalt Pavements of the ARDOT Standard Specifications for Highway Construction.

B. Placing, compacting, and acceptance shall be in accordance with Division 400, Asphalt Pavements of the ARDOT Standard Specifications for Highway Construction.

C. Surface shall be uniform and shall match adjacent surfaces.

3.6 TEMPORARY REPAIRS TO PAVED SURFACES

A. The surface shall match the surfaces on each side of the trench and shall be in accordance with applicable state, county, or local requirements.

B. The Contractor shall maintain all temporary surfaces in good condition until permanent repairs are complete.

END OF SECTION

SECTION 320129

CONCRETE PAVEMENT REPAIR

PART 1 - GENERAL

1.1 SUMMARY

- A. Repair concrete pavement disturbed during construction in accordance with this Section and details shown on the Drawings.
- B. Contractor shall comply with all requirements of state, county, city, or local authority having jurisdiction for the paved surface in which the work is being done.
- C. Contractor shall secure permits and inspections, post necessary bonds, and pay necessary fees.
- D. Where concrete streets, driveways, or parking areas are disturbed during trench excavation, the surface shall be replaced as soon as practical after completion of backfilling so as to restore it to the original condition. The Contractor shall refer to Part 3.10, Temporary Repairs to Paved Surfaces.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials, 444 North Capitol Street North West, Suite 249, Washington, DC 20001
 - 1. AASHTO M33 - Standard Specifications for Transportation Materials and Methods of Sampling and Testing.
- B. American Concrete Institute, 38800 Country Club Drive, Farmington Hills, Michigan 48331.
 - 1. ACI 614 - Recommended Practice for Mixing, Measuring and Placing Concrete.
- C. American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428.
 - 1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 2. ASTM A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 - 3. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - 4. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 5. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM C131 - Standard Specification for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
 - 7. ASTM C150 - Standard Specification for Portland Cement.
 - 8. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 9. ASTM D698 - Standard Test Methods for Laboratory Compaction of Soil Standard Effort.
 - 10. ASTM D1557 - Standard Test Methods for Laboratory Compaction of Soil Modified Effort.

11. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
 - D. Arkansas State Highway and Transportation Department, P.O. Box 2261, Little Rock, AR 72203.
 1. AHTD - Standard Specifications for Highway Construction, 2014.
 2. AHTD 303 - Aggregate Base Course.
- 1.3 SUBMITTALS

- A. Submit complete information regarding concrete mix to Engineer for review in accordance with the requirements of ASTM C94 and in accordance with Specifications Section 013300 - Submittal Procedures.

PART 2 - PRODUCTS

2.1 FORMS

- A. Forms shall be constructed prior to placement of any concrete unless otherwise authorized by Engineer.
- B. Forms shall conform to shapes, lines, and dimensions as required to conform to the original shape and dimensions of the structure to be repaired.
- C. Forms shall be sufficiently tight to prevent leakage of mortar. Forms shall be properly braced or tied together so as to maintain position and shape.
- D. Forms shall be constructed of any material with sufficient strength which shall provide the finished work a satisfactory surface; however, metal forms shall not be permitted for concrete which will be exposed on any of the completed work, except upon the specific approval of the Engineer.
- E. Forms shall be constructed in such manner that a smooth concrete surface is produced which matches the existing surfaces on each side.
- F. Forms shall be removed in such a manner as to ensure the complete safety and integrity of the structure. When the structure is supported on shores, the removable floor forms, beams, and girder sides, and column and similar vertical forms may be removed after 96 hours, providing the concrete will not be damaged. Supporting forms or shoring shall not be removed until members have achieved sufficient strength to support their weight and imposed loads safely.
- G. Forms shall be coated with oil before placement of reinforcing steel or concrete. Excessive coating material shall not be permitted to form or stand in puddles in the forms nor allowed in contact with adjacent existing concrete against which fresh concrete will be placed.

2.2 CRUSHED STONE BASE

- A. Crushed stone conforming to Section 303, Class 7 of the ARDOT Standard Specifications for Highway Construction.

2.3 EXPANSION JOINTS AND JOINT FILLER

- A. Joint Filler - Joint filler shall be pre-molded joint filler of the non-extruding type, 3/4 inch to 1 inch thick conforming to AASHTO M33, or rubber based compound conforming to Federal Specification SS-F-336. Joint filler shall be of sufficient dimension to extend through the full depth of the paved surface.
- B. Expansion and contraction joints for sidewalks, streets, driveways, curb and gutter, ditch paving, and protective slabs shall be spaced every 12 feet maximum and shall be placed to match the original joint system for the pavement.

2.4 CONCRETE

- A. Concrete shall be ready mixed concrete conforming to ASTM C94. Concrete shall not contain more than 6 gallons of water per sack of cement, including the water in aggregates, and not less than 6 sacks of cement per cubic yard of concrete.
- B. Cement: Portland Cement conforming to ASTM C150, Type 1
- C. Water used shall be clean and free from injurious amounts of oil, acids, alkalis, salt, organic matter, or other deleterious substances.
- D. Compressive Strength: 4,000 psi at 28 days.
- E. Fine Aggregate: Fine aggregate shall consist of clean, sound, properly graded sand conforming to ASTM Standard C33 uniformly graded. Fine aggregate shall be graded within the following requirements:
 - 1. Total passing the No. 4 Sieve - 95-100% by weight
 - 2. Total passing the No. 16 Sieve - 35-75% by weight
 - 3. Total passing the No. 50 Sieve - 10-25% by weight
 - 4. Total passing the No.100 Sieve - 2-8% by weight
- F. Coarse Aggregate: Coarse aggregate shall consist of crushed stone or gravel having clean, hard, strong, durable non-coated particles with not more than 5% by weight of soft fragments, 1/4% by weight of clay lumps, and 1% by weight of material removed by decantation, except that when the material removed by decantation consists essentially of crushed dirt the maximum amount permitted may be increased to one and one-half percent by weight. Rocks shall conform to ASTM Standard C131.
 - 1. Coarse aggregate may be either of two sizes, 1-1/2 inch and smaller or 3/4 inch and smaller, and shall be graded within the following requirements:
 - a. Maximum size mesh screen (sq. mesh) 0-3% retained by weight
 - b. Half maximum size mesh screen (sq. mesh) 30-65% retained by weight
 - c. No. 4 sieve 94-100% retained by weight
 - 2. Coarse aggregate for exposed aggregate surfaces shall be as follows:
 - a. Total retained on the 1 1/2 inch sieve 0%
 - b. Total retained on the 3/4 inch sieve 25 - 60%
 - c. Total retained on the 3/8 inch sieve 70 - 90%
 - d. Total retained on the No. 4 inch sieve 95 - 100%

- G. Slump: 3 to 4 inches.
- H. Air Content: Severe Condition. 5.5 percent for 1-½ inch aggregate.
- I. The concrete shall be delivered and placed within 45 minutes after all materials including mixing water have been placed in the mixing drum.

2.5 CURING COMPOUND

- A. Liquid membrane-forming, clear or translucent, suitable for spray application.
- B. Conform to ASTM C309, Type 1.

2.6 REINFORCEMENT

- A. Reinforcement shall be free from rust scale or other coatings that will destroy or reduce the bond.
- B. Reinforcing steel shall be steel of 60,000 psi minimum yield strength, conforming to the following ASTM Standards:
 - 1. A615 - Standard Specification for Deformed Billet-Steel Bars for Concrete Reinforcement
 - 2. A996 - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 - 3. A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- C. All reinforcing steel bars #3 (3/8" diameter) or larger shall be deformed bars conforming to these specifications. Plain (non-deformed) bars larger than 1/4" diameter shall not be used for reinforcing.
- D. The supplier of reinforcing steel shall furnish certification of compliance with these specifications.
- E. Reinforcement shall be shop bent, unless otherwise permitted by the Engineer. Reinforcement partially embedded in concrete shall not be bent.
- F. Reinforcement shall be accurately placed according to the Drawings or as specified herein and adequately secured in position by concrete, metal, or other approved chairs, spacers, or ties.
- G. Reinforcement shall not be welded unless specifically permitted by the Engineer.
- H. Reinforcement shall be protected by the thickness of concrete as shown on the Drawings. Where dimension are not shown, the thickness of concrete over the reinforcement shall be as follows:
 - 1. Where concrete is deposited against the ground without the use of forms, not less than 3 inches, except wire mesh reinforcement for concrete slabs which may be within 1 1/2 inches of the ground.
 - 2. Where concrete is to be exposed to the weather or to the ground but placed in forms, in slabs and wall not exposed to the ground or to the weather not less than 2 inches.
 - 3. In all other cases not less than 2 inches.

- I. Reinforcement for concrete streets, driveways, and parking lots shall be #6 bars placed at 6 inches on center perpendicular to the trench and #4 bars placed at 6 inches on center parallel to the trench.
- J. Reinforcement for sidewalks, ditch paving, and slope protection shall consist of 6 inch x 6 inch mesh, #6 for driveways and #9 for ditch paving, slope protection and sidewalks.

2.8 ACCEPTANCE OF MATERIALS

- A. Materials shall be subject to inspection for suitability by the Engineer prior to or during incorporation into the work.

PART 3 - EXECUTION

3.1 GENERAL

- A. Concrete surfaces for streets, roads, driveways, and parking lots that are removed and/or damaged by construction operations shall be repaired with concrete with a minimum thickness of 6-inches or as shown on the Drawings.
- B. Concrete surfaces for sidewalks, slope protection, and ditch paving that are removed and/or damaged by construction operations shall be repaired with concrete with a minimum thickness of 4-inches or as shown on the Drawings.
- C. Before replacing surfacing, the existing pavement shall be cut, sawed, or trimmed along straight and vertical lines using a concrete saw or other suitable tool.
- D. Temporary repairs to paved surfaces shall be made with cold mix asphalt to allow access. Final repairs shall be made within 60 days weather permitting. Driveways shall be maintained to allow access during all weather conditions.
- E. After removal of forms and finishing, backfill shall be placed around the structures and thoroughly compacted.

3.2 EXCAVATION AND BACKFILL

- A. Excavate and backfill in accordance with Specifications Section 312300 Trench Excavation, Backfill, and Compacting.

3.3 PREPARATION OF SUBGRADE

- A. Bring the areas where pavement, curbs, and sidewalks are to be constructed to required grade on undisturbed ground and compact by sprinkling and rolling or mechanical tamping.
- B. As depressions occur, refill with crushed stone base course material and recompact until the surface is at the proper grade.
- C. Compact subgrade on fill to 95 percent of maximum density at optimum moisture content as determined by ASTM D698 Standard Proctor Density.

3.4 PLACING CRUSHED STONE BASE

- A. After subgrade for sidewalks and curbs is compacted and at proper grade, spread at least 4 inches of crushed stone base course material and compact to at least 95 percent of maximum density as determined by ASTM D698 Standard Proctor Density.
- B. Sprinkle with water and compact by rolling or other method.
- C. Top of compact granular fill shall be at proper level to receive concrete after taking slab thickness and desired finished grade into account.

3.5 SETTING FORMS

- A. Construct forms to the shape, lines, grades, and dimensions called for on the Drawings, or match shape, lines, grades, and dimensions of cut curbs.
- B. Stake wood or metal forms securely in place, true to line and grade.
- C. Brace forms to prevent change of shape or movement in any direction resulting from the weight of the concrete during placement.
- D. Construct short-radius curved forms to exact radius.
- E. Tops of forms shall not depart from grade line more than 1/8 inch when checked with a 10 foot straightedge.
- F. Alignment of straight sections shall not vary more than 1/8 inch in 10 feet.
- G. Forms shall be cleaned and oiled thoroughly after each use and before concrete is placed.

3.6 PLACING CONCRETE

- A. All placement of concrete shall be in the presence of the Engineer or his representative. The Contractor may be required to remove, without compensation, any concrete placed in the absence of the Engineer or his representative.
- B. Equipment for chuting, pumping and pneumatically conveying concrete shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials. All concrete in walls and columns shall be poured through tremies unless otherwise permitted by the Engineer. The free fall of concrete shall be held to a minimum.
- C. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. The placing of concrete shall be carried on at such a rate that concrete is at all times plastic and flows readily into the spaces between the bars. No concrete that has been contaminated by foreign material shall be used.
- D. Once placement has started, it shall be carried on as a continuous operation until placement of the panel or section is complete. When construction joints are necessary, they shall be constructed in accordance with these specifications.

- E. Concrete shall be placed and vibrated in such a manner as to prevent coarse aggregate to separate from mortar, that no rock pockets are left, that the concrete flows readily around the steel reinforcement and into the extremities of the forms. Free water shall not be present on the surface of the concrete. All concrete paving shall be poured and vibrated with mechanical vibration equipment.
- F. Water shall be removed from the place of deposit before concrete is placed. Before depositing concrete on or against concrete which has taken its initial set, the surface of the hardened concrete shall be broken off down to coarse aggregate and wire brushed to remove foreign matter and laitance. A layer of grout of the same cement-sand ratio as the concrete without coarse aggregate shall be placed to a thickness of one to two inches on the brushed surface after which the new concrete shall be placed immediately.

3.7 FLAT SURFACES

- A. Concrete shall be deposited and leveled so that the surface conforms to the line, grade and finish required to match adjacent surfaces.
- B. Exposed aggregate finish - Scrubbed finish shall be produced on green concrete. The surface shall be thoroughly wetted and scrubbed with stiff fiber or wire brushed, using water freely, until the surface film of mortar is removed and the aggregate is uniformly exposed. The surface shall then be rinsed with clean water. If portions of the surface have become too hard to scrub in equal relief, dilute hydrochloric acid (commercial muriatic acid diluted with 4 to 10 parts water) shall be used after the concrete is at least two weeks old to facilitate the scrubbing. The acid shall be removed within 15 minutes from the finished surface with clean water. This operation may be facilitated by casting the concrete against form faces which have been coated with a chemical retarder to keep the mortar adjacent to the form from setting. Every effort shall be exerted to assure that the new surface matches any existing adjacent surfaces.
- C. Protect flat surfaces from damage for period of 10 days.

3.8 COLD WEATHER REQUIREMENTS

- A. Concrete shall not be placed when the ambient temperature is below 40 degrees F, or when the concrete is likely to be subjected to freezing temperatures before final set has occurred. Concrete footings or slabs shall not be placed over frozen ground. The temperature of the concrete when placed shall not be less than 45 degrees F. Suitable means shall be provided for maintaining the concrete at a temperature of 45 degrees F for not less than 96 hours after placing.
- B. Any concrete damaged by freezing shall be removed and replaced at the expense of the Contractor.

3.9 HOT WEATHER REQUIREMENTS

- A. Suitable precautions shall be taken in hot weather to avoid drying of the concrete prior to finishing operations.
- B. Concrete deposited in hot weather shall not have a placing temperature that will cause difficulty from loss of slump, flash set, or cold joints. Concrete temperatures shall be less than 90 degrees F.

3.10 TEMPORARY REPAIRS TO PAVED SURFACES

- A. Unless permanent repairs to paved surfaces will be repaired within two (2) days after backfilling the trench, the Contractor shall place suitable asphalt material in the trench. This shall apply to driveways, sidewalks, parking lots, or other paved surface whenever the backfill will not adequately support vehicular traffic, whenever dust from the trench creates a nuisance, or whenever the trench is a hazard.
- B. The surface shall match the surfaces on each side of the trench and shall be in accordance with applicable state, county, or local requirements.
- C. The Contractor shall maintain all temporary surfaces in good condition until permanent repairs are complete.
- D. Detours shall have a gravel, crushed stone, or asphalt surface. Dust shall be controlled by the application of asphalt or water.

END OF SECTION

SECTION 321540
GRAVEL SURFACING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Repairing gravel surfaces disturbed during construction.

1.2 REFERENCES

- A. American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.
 - 1. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. Arkansas Department of Transportation (ARDOT), P.O. Box 2262, Little Rock, Arkansas 72203.
 - 1. ARDOT 303 - Aggregate Base Course.

1.3 TESTS

- A. Gradation of stone materials will be performed in accordance with ASTM C136.

PART 2 PRODUCTS

2.1 MATERIAL

- A. Gravel:
 - 1. Crushed or uncrushed stone.
 - 2. Free from objectionable, deleterious, or other injurious matter.
 - 3. Graded to ARDOT designation Class 7.

PART 3 EXECUTION

3.1 PLACING GRAVEL

- A. For compacted depths exceeding 8 inches, place material in multiple courses of equal depth which do not exceed 8 inches.
- B. Minimum thickness of gravel drives, shoulders and surfaces shall be as shown on the Drawings.
- C. Compact each course with mechanical compaction equipment approved by the Engineer. Compaction with wheel of backhoe or track of trackhoe is not acceptable. Compact to 95 percent of maximum density at a moisture content of 0 to 2 percent of optimum as determined by ASTM D698 Standard Proctor Density.
- D. Finish grade to provide smooth transition with surrounding gravel. Avoid leaving any humps or ruts.

- E. Repair settling as required.

END OF SECTION

SECTION 329219

SEEDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Work items for this section include the operations necessary to produce established grass-covered areas for restoring and stabilizing soils damaged by construction.
- B. Contractor shall seed, fertilize, and mulch as herein specified any and all areas impacted by construction activity that are not within a maintained lawn such as woods. Areas considered to be maintained lawns shall be as determined by the Engineer.
- C. Sod areas of maintained yards in accordance with Section 329223 - Sodding. Areas considered to be maintained lawns shall be as determined by the Engineer.
- D. **Cultivated fields used for crops such as soy beans, wheat, rice, etc. shall not be seeded, fertilized or mulched.**
- E. Seeding operations shall begin immediately after the trench backfill and rough grading in an area are completed to deter erosion and siltation of streams.
- F. All vegetation damaged by construction activities shall be replaced with healthy vegetation of the same kind or type. All plants shall be replanted in the original location.
- G. The Contractor shall maintain all such replanted vegetation by the application of water, fertilizers and topsoil. The vegetation shall be cultivated to prohibit the growth of foreign vegetation until a well-developed root system has been established and transplanted vegetation has overcome the "shock" resulting from transplanting.
- H. **The Contractor shall not use individual homeowners utilities, including water, for construction or maintenance activities.**

1.2 SUBMITTALS

- A. All agreements between the Contractor and Land Owner shall be in writing and shall be submitted to the Engineer.
- B. Submit in accordance with Section 013000 – Submittals.

PART 2 - PRODUCTS

2.1 IMPORTED SURFACE MATERIAL (TOPSOIL)

- A. Suitable sandy loam from an approved source.
- B. Possess friability and a high degree of fertility.
- C. Free of clods, roots, gravel, rocks, and other inert material.
- D. Free of quackgrass, horsetail, and other noxious vegetation and seed.

- E. Acidity range (pH) of 5.5 to 7.5.
- F. Minimum of 4 percent and maximum of 50 percent organic matter.

2.2 WATER

- A. Central Arkansas Water is the owner of the water distribution system within the project area. The Contractor shall contact Central Arkansas Water for any water that is required.
- B. The Contractor shall connect to the Central Arkansas Water distribution system in accordance with all requirements of Central Arkansas Water. The Contractor shall install a backflow prevention device and meter if required by the Central Arkansas Water.
- C. The Contractor shall be responsible for any fees and water use charges as may be charged to the Contractor by Central Arkansas Water.
- D. **The Contractor shall not use individual homeowners utilities, including water, for construction or maintenance activities.**

2.3 LIME

- A. Lime shall be agricultural grade ground limestone or equivalent as approved by the Engineer.

2.4 FERTILIZER

- A. Fertilizer shall be a commercial grade, uniform in composition, free flowing, and suitable for application with mechanical equipment. It shall be delivered to the site in labeled containers conforming to current Arkansas fertilizer laws and bearing the name, trademark, and warranty of the producer.

2.5 SEED

- A. Except as modified herein, the seed shall comply with the current rules and regulations of the Arkansas State Plant Board and the germination test shall be valid on the date the seed is used. It shall have a minimum of 98% pure seed and 85% germination by weight, and shall contain no more than 1% weed seeds. A combined total of 50 noxious weed seeds shall be the maximum amount allowed per pound of seed with the following exceptions: Johnson grass seed, wild onion seed, wild garlic seed, field bindweed seed, nut grass seed, sickle pod seed, sesbania seed, indigo seed, morning-glory seed, and cocklebur seed will not be allowed in any amount. Seed shall be furnished in sealed, standard containers. Seed that has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable.
 - 1. Legumes shall be inoculated with an approved culture as recommended by the manufacturer, just prior to seeding.
 - 2. Seed shall be composed of the varieties and amounts by weight as shown below.
 - 3. The seeding mixture may be altered by the Engineer for use in selected areas with no adjustment in contract price. The alteration shall be on an equivalent cost basis.
 - 4. Seeding mixtures are shown below for areas to be seeded. Mixtures may be adjusted by Contractor with Engineer's approval to match the original condition of area to be vegetated.

SEEDING MIXTURES

<u>Mixture No.</u>	<u>Seed</u>	<u>lbs./acre</u>
1	Bermuda Grass (unhulled)	10
	Bermuda Grass (hulled)	5
	Annual Ryegrass	25
2	Bermuda Grass (unhulled)	5
	Bermuda Grass (hulled)	3
	Red Fescue	20
	Annual Ryegrass	30
3	Bermuda Grass (unhulled)	10
	Bermuda Grass (hulled)	5
	Lespedeza (Kobe)	10
	Annual Ryegrass	30
4	Bermuda Grass (unhulled)	20
	Bermuda Grass (hulled)	5
	Wheat	20
	Crimson Clover (Dixie)	20
	Lespedeza (Kobe)	20
	Annual Ryegrass	20
5	Wheat	30
	Crimson Clover (Dixie)	10
	Annual Ryegrass	30

SEEDING MIXTURE USAGE

<u>Location</u>	<u>Time of Seeding</u>		
	<u>3/1-6/15</u>	<u>6/16-8/31</u>	<u>9/1-2/28</u>
Lawns/Yards			
Sun	1	1	3
Shade	2	2	2
Pasture	3	3	4
Cultivated	No seeding unless erosion is anticipated (for erosion control use 50 lbs/acre of annual ryegrass.)		
Timber Woodlands	5	5	5

2.6 MULCH

- A. Mulch cover shall consist of; straw from threshed rice, oats, wheat, barley, or rye; wood excelsior; hay obtained from various legumes or grasses, such as lespedeza, clover, vetch, soybeans, bermuda, carpet sedge, bahia, fescue, or other legumes or grasses; or a combination thereof. Mulch shall be dry and reasonably free from Johnson grass or other noxious weeds, and shall not be excessively brittle or in an advanced state of decomposition.

2.7 TACKIFIERS

- A. Tackifiers used in mulch anchoring shall be of such quality that the mulch cover will be bound together to form a cover mat that will stay intact under normal weather conditions.

PART 3 - EXECUTION

3.1 SEQUENCE

- A. Unless otherwise requested in writing and acceptable to the Engineer, the sequence of work shall be finish grading, application of lime and fertilizer, seeding, firming and cultipacking, mulching seeded areas, vibratory rolling, cleanup, protection, maintenance, and final acceptance.
- B. If trenching operations do not commence within 30 days after clearing and grubbing, the disturbed area shall be seeded.
- C. Minimize disturbances to sodded and/or landscaped thoroughfares and areas on or adjacent to improved property. Do not use such areas as storage sites for construction supplies and insofar as practicable, keep free from stockpiles and excavated materials. Restore public property with strict adherence to the requirements of the public body having jurisdiction therein.

3.2 FINISH GRADING

- A. After trench backfilling and compacting activities have been completed, all areas which have been disturbed or damaged by construction operations shall be brought to original grade, or if directed by the Engineer, graded to secure effective drainage. Unless otherwise indicated, a slope of at least 1 percent shall be provided. All ruts, deep tracks, dead furrows and ridges shall be eliminated.
- B. In areas of maintained lawn grass, 6 inches of topsoil shall be placed. Imported topsoil may be substituted for stockpiled surface material. Topsoil shall be of a quality at least equal to the existing surface material in adjacent areas, free from trash, debris, and well suited to support plant growth.
- C. Maintain finish grade until final acceptance. Repair damage caused by work operations or erosion. Add imported topsoil, if required.
- D. Refer to specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers" for appropriate elevations and grades to be established and maintained.

3.3 CLEARING

- A. Prior to seeding, vegetation that may interfere with operations shall be mowed, grubbed, and raked. The collected material shall be removed from the site. The surface shall be cleared of stumps, loose surface rocks, roots, cable, wire, and other materials that might hinder the work or subsequent maintenance.
- B. Remove trees, shrubs, brush, crops, and other vegetation within the limits of the easement (right-of-way), private property, or areas where work is to commence, as required. All efforts shall be made to retain existing landscaping. In the event that trees, shrubbery, hedges, and other landscaping cannot be saved, then prior approval from the property owner must be obtained before the existing landscaping can be removed. Provide Engineer with written authorization or agreements between the property owner and the Contractor, prior to work on the site.
- C. All trees shall be saved unless removal is approved by the property owner. Trim trees, as required, in accordance with the property owner's instructions.

- D. Shrubbery shall be saved unless removal is approved by the property owner. Contractor shall make reasonable efforts to save all shrubbery by trimming, in accordance with acceptable pruning practices, and treating wound surfaces with a commercial pruning compound.
- E. For small plants, flowers, or other landscaping vegetation, at least two weeks prior to the start of construction, Contractor shall notify the property owner of the proposed starting date so that the property owner can remove any small plants or flowers located within area of construction.
- F. Refer to specification Sections in Division 31 regarding further requirements on clearing, grubbing, tree protection and trimming, and landscape protection and restoration.

3.4 APPLICATION OF LIME AND FERTILIZER

- A. The fertilizer and lime shall be distributed uniformly over the areas to be seeded and sodded at the following rates:
 - 1. Fertilizer: At a rate necessary to provide 80 pounds of each pure chemical per acre, such as 800 pounds of 10-10-10 or 666 pounds of 12-12-12.
 - 2. Lime: One ton per acre or as recommended by soil test.
- B. Fertilizer shall be uniformly incorporated into the soil or combined with seed in the hydro-seeding operation.

3.5 APPLICATION OF SEED

- A. Sowing of seed shall be by mechanical walk-behind seeders or power equipment (hydro-seeder). Either method must give uniform distribution and no seeding shall be permitted during a high wind.
- B. The ground shall be watered before and after seeding as conditions may warrant.
- C. The area seeded shall be firmed with a cultipacker immediately after broadcasting. If hydro-seeding, the area shall be lightly firmed with a cultipacker immediately before broadcasting.

3.6 APPLICATION OF MULCH

- A. Mulch cover shall be applied at the rate of 4,000 pounds per acre immediately after seeding and shall be spread uniformly over the entire area by approved power mulching equipment. When approved by the Engineer, the Contractor may use hand methods to apply mulch cover to small or inaccessible areas.
- B. Mulch shall be stabilized by anchoring or applying a tackifier.
- C. If the Contractor so elects, an approved mulching machine may be used whereby the application of mulch cover and tackifier may be combined into one operation. If this method is used, no change in application rates will be allowed.
- D. In its final position, the anchored mulch shall be loose enough to allow air to circulate, but compact enough to partially shade the ground and reduce the impact of rainfall on the surface of the soil. Tackifier shall not discolor or mark structures, pavements, utilities, or other plant growth.

3.7 ROLLING

- A. All seeded areas for established lawns and yards (not designated to be sodded) shall be rolled with a drum roller to achieve a smooth surface.

3.8 PROTECTION

- A. Seeded areas shall be protected against traffic. If necessary, barricades or warning signs shall be erected. Such protective devices shall be maintained until acceptance of the work as specified herein.

3.9 CLEANUP

- A. After completion of the seeding operations, the entire area shall be cleared of excess soil and waste material, including, but not limited to, stones, stumps, roots, brush, wire, grade stakes, and all objects that might be a hindrance to maintenance operations or affect the visual appearance of the site. All roads over which hauling operations have been conducted, regardless of the type of surfacing, shall be kept clean, and soil clods and debris left on the surface shall be removed. The wheels of vehicles shall be cleaned to avoid leaving soil upon the surface of roads, walks, and other surfaced areas.

3.10 MAINTENANCE

- A. All seeded areas shall be maintained and watered by the Contractor until acceptance of the work as specified herein. Maintenance shall include reseeding, watering, repair of erosion damage, and maintenance of mulch. **The Contractor shall not use individual homeowners utilities, including water, for construction or maintenance activities.**
- B. Replanting: Prior to acceptance, seeded areas that show signs of substantial desiccation, as evidence by loss of color and distinct yellowing or by lack of germination, shall be considered failed and shall be reseeded and continue to be reseeded until an acceptable cover is obtained. Replanting operations shall be as originally specified.
- C. Maintenance of Grades: Original grades of seeded areas shall be maintained after commencement of planting operations and until acceptance. Any damage to the finished surface from construction operations shall be repaired within a reasonable time. In the event erosion occurs from rainfall, such damage shall be repaired within a reasonable time. Ruts, ridges, tracks, and other surface irregularities shall be corrected, and reseeded where required.
- D. Maintenance of Mulch: Mulch shall be maintained until covered with growing grass seedlings. Material that has been removed from the site by wind or other causes shall be replaced and secured.

3.11 WATER SPRINKLER SYSTEM

- A. Prior to, or during preparation of sod bed, the Contractor shall set up sprinkler system equipment needed to water the sod.
- B. Central Arkansas Water is the owner of the water distribution system within the project area. The Contractor shall notify Central Arkansas Water for any water that is required.
- C. The Contractor shall connect to the Central Arkansas Water distribution system in accordance with all requirements of Central Arkansas Water. The Contractor shall install a backflow prevention device and meter if required by the Central Arkansas Water.

- D. The Contractor shall be responsible for any fees and water use charges as may be charged to the Contractor by Central Arkansas Water.
- E. No sod may be placed until water system is in place.
- F. **The Contractor shall not use individual homeowners utilities, including water, for construction or maintenance activities.**

3.12 FINAL ACCEPTANCE

- A. If a satisfactory stand of grass has not been produced, the Contractor shall renovate and reseed the grass or unsatisfactory portions thereof.
- B. A satisfactory stand is defined as grass or section of grass that has:
 - 1. No bare spots larger than 1 square feet.
 - 2. Not more than 10 percent of total area with bare spots larger than 1 square foot.
 - 3. Not more than 15 percent of total area with bare spots larger than 6 inches square.
- C. Satisfactory stands of grass shall be at the sole discretion of the Engineer.

END OF SECTION

SECTION 329223

SODDING

PART - GENERAL

1.1 GENERAL

- A. This section shall include preparation of the sod bed, furnishing and installing sod, watering, and maintenance for designated areas as shown on the Drawings and specified herein.
- B. Contractor shall sod all areas disturbed by construction activities, including areas where excavation is temporarily stockpiled over existing ground. Areas considered to be maintained yards or lawns shall be as determined by the Engineer.
- C. The work under this Section shall be accomplished as soon as practicable after finish grading in order to deter erosion.
- D. **Stripping and/or cutting existing sod in areas that will be disturbed shall not be permitted to be used to replace sod in areas that are disturbed by construction activities. All sod shall be obtained from a sod farm.**
- E. All vegetation damaged by construction activities shall be replaced with healthy vegetation of the same kind or type. All plants shall be replanted in the original location.
- F. The Contractor shall maintain all such replanted vegetation by the application of water, fertilizers, and topsoil. The vegetation shall be cultivated to prohibit the growth of foreign vegetation until a well-developed root system has been established and transplanted vegetation has overcome the "shock" resulting from transplanting.
- G. Minimize disturbances to sodded and/or landscaped thoroughfares and areas on or adjacent to improved property. Do not use such areas as storage sites for construction supplies and insofar as practicable, keep free from stockpiles and excavated materials. Restore public property with strict adherence to the requirements of the public body having jurisdiction therein.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013300 - Submittals.
- B. Product Data:
 - 1. Common name of each grass species.
- C. Quality Control Submittals:
 - 1. Grower's Qualifications Data:
 - a. Name, business address, and telephone number of sod grower.
 - b. Statement listing the growers qualifications
- D. All agreements between the Contractor and land owner shall be in writing and shall be submitted to the Engineer.

1.3 DELIVERY, HANDLING, AND STORAGE

- A. Protect sod from dehydration, contamination and heating during transportation, delivery and storage.
- B. Sod shall be harvested, delivered and transplanted within a period of twenty-four (24) hours unless a suitable preservation method is approved.
- C. Keep stored sod moist and under shade or covered with moistened burlap.
- D. Sod showing visible signs of heating will be rejected.
- E. Deliver fertilizer to site in original, unopened containers, each bearing manufacturer's guaranteed analysis.

PART 2 - PRODUCTS

2.1 SOD

- A. Sod shall be well established, nursery grown sod:
 - 1. Bermuda
 - 2. Zoysia
 - 3. St. Augustine
- B. Sod shall match type and species of existing grass in disturbed areas designated for sod

2.2 IMPORTED SURFACE MATERIAL (TOPSOIL)

- A. Suitable sandy loam from an approved source.
- B. Possess friability and a high degree of fertility.
- C. Free of clods, roots, gravel, rocks, and other inert material.
- D. Free of quackgrass, horsetail, and other noxious vegetation and seed.
- E. Acidity range (pH) of 5.5 to 7.5.
- F. Minimum of 4 percent and maximum of 50 percent organic matter.

2.3 WATER

- A. Central Arkansas Water is the owner of the water distribution system within the project area. The Contractor shall contact Central Arkansas Water for any water that is required.
- B. The Contractor shall connect to the Central Arkansas Water distribution system in accordance with all requirements of Central Arkansas Water. The Contractor shall install a backflow prevention device and meter if required by the Central Arkansas Water.
- C. The Contractor shall be responsible for any fees and water use charges as may be charged to the Contractor by Central Arkansas Water.
- D. **The Contractor shall not use individual homeowners utilities, including water, for construction activities.**

PART 3 - EXECUTION

3.1 WATER SPRINKLER SYSTEM

- A. Prior to, or during preparation of sod bed, the Contractor shall set up sprinkler system equipment needed to water the sod.
- B. Central Arkansas Water is the owner of the water distribution system within the project area. The Contractor shall notify Central Arkansas Water for any water that is required.
- C. The Contractor shall connect to the Central Arkansas Water distribution system in accordance with all requirements of Central Arkansas Water. The Contractor shall install a backflow prevention device and meter if required by the Central Arkansas Water.
- D. The Contractor shall be responsible for any fees and water use charges as may be charged to the Contractor by Central Arkansas Water.
- E. No sod may be placed until water system is in place and all construction work in the area is complete.
- F. **The Contractor shall not use individual homeowners utilities, including water, for construction activities.**

3.2 PREPARATION OF SOD BED

- A. Rototill and scarify topsoil to a minimum depth of 3" to a fine and mellow condition. Lightly rake to provide a smooth, uniform and fine surface texture. Remove ridges and fill depressions as required to drain.
- B. Remove gravel, stone, roots, sticks, rubbish and any other material left over from construction operations. Remove any material greater than ¾" in dimension.
- C. Top of finish grade shall be below adjacent curbs, walks, and drains approximately 1-1/2" so that after sod is installed it will be flush or slightly below curbs, walks, drains and seeded areas.

3.3 SOD INSTALLATION

- A. Do not install sod when temperature is below 32 degrees F.
- B. Do not install sod on saturated or frozen soil.
- C. Protect newly installed sod against vehicular traffic.
- D. Dampen dry soil prior to sodding.
- E. Lay sod uniformly, evenly and parallel to the finished contour and at right angles to the center line of ditches and swales. Begin sodding at bottom of slopes.
- F. Minimize traffic on newly laid sod during installation. Provide plank or wood sheets as may be required to protect sod already laid during sodding operations.
- G. Lay each strip with tightly-fitted joints against each other without voids. Do not overlap edges. Joints at the ends of sod strips shall be staggered with adjacent strips of sod.

- H. Finish sod edges at walks, curbs, planting, mulch edges, and other vertical surface by cutting neatly and fitting tightly to edge and line.
- I. Sod mat to be approximately one inch below finished height of walks, pavement, curbs, etc. Any sod not conforming to this requirement will be removed, the subgrade adjusted, and the sod re-laid.
- J. Where new sod joins existing lawns, cut straight and neatly into existing lawn and level subgrade to allow height to match.
- K. Soil shall be firmed or heeled in along the edges of the sodded areas.
- L. Stake sod on slope ratio of 1 on 2 or steeper with minimum of two 8 inch stakes per square yard.
- M. After all sod is laid and thoroughly watered, roll all sodded areas (except staked sod), either with a small mechanical or hand roller, sufficiently to set or press sod into soil.

3.4 MAINTENANCE

- A. For the first two (2) weeks following the placing of the sod, all sodded areas shall be thoroughly watered daily, through the use on an onsite watering system. **The Contractor shall not use individual homeowners utilities, including water, for construction activities.**
- B. Continue maintenance until sodded areas are established with sod knitted in place. Maintenance period shall be minimum of 28 days, or to final acceptance.
- C. Maintenance of sodded areas shall include watering, weeding, mowing to a two to two and one half (2 – 2 ½”) inches height after growth has exceeded three (3”) inches and prior to a four (4”) inch growth, and replacement and installation of sod as originally specified for sodded areas failing to survive. Clippings from mowing which mat on the grass are to be removed.
- D. Water all sodded areas during maintenance period as necessary to maintain sod and soil moisture, supplement rainfall, to promote growth, proper rooting to insure sod survival and to prevent dormancy.

3.5 CLEANUP

- A. After completion of the sodding operations, the entire area shall be cleared of excess soil and waste material, including, but not limited to, stones, stumps, roots, brush, wire, grade stakes, and all objects that might be a hindrance to maintenance operations or affect the visual appearance of the site. All roads over which hauling operations have been conducted, regardless of the type of surfacing, shall be kept clean, and soil clods and debris left on the surface shall be removed. The wheels of vehicles shall be cleaned to avoid leaving soil upon the surface of roads, walks, and other surfaced areas.

3.6 FINAL ACCEPTANCE

- A. If a satisfactory stand of grass has not been produced or if the sod dies, the Contractor shall renovate and re-sod the grass or unsatisfactory portions thereof.
- B. A satisfactory stand is defined as grass or section of grass that has:
 - 1. No bare or dead spots larger than 1 square feet.

2. Not more than 10 percent of total area with bare or dead spots larger than 1 square foot.
 3. Not more than 15 percent of total area with bare or dead spots larger than 6 inches square.
- C. Satisfactory stands of grass shall be determined at the sole discretion of the Engineer.

END OF SECTION

SECTION 333910

REPLACEMENT OF MANHOLE FRAMES AND COVERS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Section describes the removal, replacement, and realignment of manhole frames (rings), covers (lids), and frame seals.
- B. The procedures included under this bid item shall be for all labor and equipment necessary for the removal, replacement, and realignment of manhole frames, covers, and frame seal, including but not limited to the saw-cutting and/or pavement removal, excavation, sealing of manhole frame and cover, realignment of the manhole frame and cover, removal and disposal of any loose and unsound material (within the area of work covered under this section), backfilling, pavement repair, site restoration, and any other related and incidental work as may be required to provide a complete and total replacement of manhole cover and frame with sealing. Refer to specification section 333921 "Manhole Grade Adjustments, Less Than 12 Inches" for grade adjustments 12 inches or less.
- C. Grade adjustments shall be measured and paid for in accordance with specification 012200 "Measurement and Payment". Payment and measurement shall not include the height of the joint material. Refer to specification Section 333920 "Manhole Grade Adjustments Greater Than 12 Inches" and specification Section 333921 "Manhole Grade Adjustments Less Than 12 Inches".
- D. Refer to Section 333913 "Sanitary Sewer Manholes, Frames, and Covers" for manhole construction materials and methods not discussed in this Section.

1.2 DEFINITIONS

- A. Manhole Frame/Ring – The portion of the manhole castings that holds the cover and that extends from the chimney up to an elevation above or at the surface in which the manhole is installed.
- B. Manhole Frame Seal – A coating or sealing system that bridges the joint between the manhole frame and the manhole chimney, ensuring there is no water intrusion at that location.
- C. Manhole Cover/Lid – A removable, plate, made of cast iron, which fits flush within a manhole frame/ring and forms the lid over the opening of a manhole.
- D. Chimney – The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.
- E. Cone or Corbel - That portion of the manhole structure which slopes downward and outward from the bottom of the manhole frame to the required barrel of the manhole. "Corbel" refers to a section built of brick or block, while "cone" refers to a precast, fiberglass or plastic section.
- F. Barrel – The barrel is the cylindrical portion of the manhole that typically maintains a consistent diameter, and runs from the Corbel or Cone down to the manhole bench at the bottom.

- G. Bench – The additional concrete that is applied at the bottom of the manhole and shaped in such a way to direct and maintain the water flow into the associated pipes.

1.3 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

1.4 STANDARDS OF ADJUSTMENT

- A. All manhole frames that are 2 inches or more below grade shall be excavated and raised. Manholes shall be accurately set to line and grade by removing the frame and cover, raising, or lowering the structure as required, and resetting the manhole and all components.

PART 2 - PRODUCTS

2.1 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 STANDARD MANHOLE FRAME AND COVER

- A. Standard manhole frames and covers shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.3 WATERTIGHT MANHOLE FRAME AND COVER

- A. Watertight manhole frame and covers shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.4 MANHOLE RISER AND ADJUSTMENT RINGS

- A. Manhole riser and adjustment rings shall be in accordance with specification Sections 333913 "Sanitary Sewer Manholes, Frames, and Covers", 333920 "Manhole Grade Adjustments, Greater Than Twelve-Inches", and 333921 "Manhole Grade Adjustments, Less than Twelve-Inches."
- B. For manhole adjustments more than 12-inches in height, modify lower riser section(s) as specified in Section 333920.
- C. Existing grade adjustment rings constructed of pre-cast concrete may be reused provided they are not cracked or damaged, and are in otherwise good condition.

2.5 BUTYL MASTIC SEALANT

- A. Butyl mastic sealant shall be used when joining the casting frame to the manhole, and between manhole adjustment riser rings.
- B. The manhole frame seal shall be capable of repeated vertical movement of the frame and repeated horizontal movement after installation and throughout its design life.
- C. Butyl mastic sealant shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.6 MANHOLE EXTERIOR JOINT WRAP

- A. The exterior of all cold joints in precast adjustment grade rings and joints at manhole frame-to-throat or chimney connections, shall be sealed with a 6" wide self-priming, self-sealing, permanently flexible, butyl based joint seal.
- B. Exterior joint seal wrap shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.7 NON-SHRINK GROUT (HYDRAULIC)

- A. Hydraulic non-shrink grout shall be "Rehabilitation Patching Material" as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Hydraulic non-shrink grout (patching material) shall be used in grouting interior spaces at joints of manholes, interior spaces at joints of adjustment riser rings, and other places as designated to receive hydraulic non-shrink grout.

2.8 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Non-shrink repair mortar shall be used for grouting and setting manhole ring and covers, flat annular spaces between extension rings, and other applicable repairs.

PART 3 – EXECUTION

3.1 GENERAL

- A. Manhole riser rings may be used to raise manhole covers to grade. The throat section height shall be 12-inches maximum. The throat section shall be as defined as the distance from the top of the manhole cover to the top of the manhole structure (cone or barrel section). The following shall apply to such instances:
 - 1. For an adjustment where a throat height with manhole riser rings would be greater than 12-inches, the corbel/cone shall be raised but is limited to a maximum height of 30-inches.
 - 2. For grade adjustments that require a throat section greater than 12-inches and a corbel/cone section greater than 30-inches, the manhole grade shall be adjusted by adjusting the manhole barrel and installing a new manhole section.
- B. Joint sealing and other associated construction materials and execution of such shall be as required in specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- C. Joint surfaces shall be free of dirt, stones, debris, and voids to ensure a watertight seal. If minor elevation adjustment (less than 2-inches) is required to match the existing pavement surface, non-shrink grout may be used to adjust the elevation, as detailed herein.
- D. The interior annular space at horizontal cold joints and joints between riser rings shall be grouted after installation with non-shrink grout

- E. Maximum adjustment height of the throat section shall be 12-inches. The throat section shall be defined as the distance from the top of the concentric cone section to the top of the manhole cover.
- F. Set manhole frame and cover to elevation indicated in specification Section 333913, Part 3.1.1 for improved and unimproved areas and paved areas.

3.2 PREPARATION

- A. Place covers over inlets and outlets to prevent extraneous material from entering the sewer lines. Any construction related material that enters the sewer mains shall be removed by the Contractor at no additional cost to the Owner.
- B. Ensure construction activities are in accordance with any safety and weather conditions required by the manufacturer or as modified by applicable rules and regulations of local, state, and federal authorities having jurisdiction.
- C. Install and operate sewage diversion pumping equipment to maintain sewage flows without backup, overflow, or spillage.
- D. Traffic control, siltation control, and other standard construction requirements shall be in accordance with the specifications in Division 01, Division 31, and Division 32 of these Contract Documents.

3.3 EXCAVATION

- A. Remove pavement, if applicable, and excavate around the manhole as necessary to prevent soil and debris from falling into the manhole while the frame and grade rings are removed. Dewater all excavations as required. Provide sheeting and shoring as required.
- B. All of the pavement or ground inside of the cut shall be removed to allow safe working conditions during the replacement of the manhole frame, cover, and seal and for adjustment and restoration of the top of the manhole to the proper elevation.
- C. Non-paved Areas: Excavate adjacent to the manhole to expose the entire frame to a minimum depth of 6-inches below the top of the structurally sound structure. Limit excavation to a 6-foot by 6-foot work area. The sides of the trench shall not deviate from the vertical for more than 1/2-inch for each foot of depth.
- D. Paved Areas: Make a square or rectangular full depth saw-cut and remove the pavement by breaking out from the saw-cut toward the manhole. Do not use pavement breaking equipment in the saw-cut. Limit saw-cutting to a 4-foot by 4-foot square cut or a 4-foot diameter circular cut in the pavement. Excavate the work area to expose the entire frame to a minimum depth of 6-inches below the top of the structurally sound structure.
- E. Material excavated is defined as unclassified excavation regardless of the material encountered.
- F. The Contractor shall be responsible for all settlement of backfills, fills, and embankments which may occur during the warranty period (one year) stipulated in the General Conditions. Where settlement occurs in streets, driveways, roads, parking areas, or other paved surfaces, the Contractor shall refill them frequently enough to maintain traffic without hazard at all times. The Contractor shall make or cause to be made, all repairs or replacements made necessary by the settlement within 7 days after notice by the Engineer or Owner, at no additional cost to the Owner.

- G. Any excavation which remains open overnight shall be properly barricaded and lighted in accordance with OSHA standards to avoid injury to persons and property.

3.4 CONSTRUCTION METHODS

- A. Removal, replacement, and raising of manhole frames and covers shall utilize materials as specified, and the work shall be generally performed as follows. *Contractor is ultimately responsible for means and methods of the required work.*
1. Prepare for work as defined above. Excavate as required and as described above. Materials shall be removed from around the frame to a depth to expose the entire frame and cover, and 6-inches of the top of the manhole corbel. If manhole structure or adjustments are found to be brick, block, or other material, expose at least two brick or block courses.
 2. Remove manhole frame and cover from the manhole structure.
 3. Separate and observe the condition of any existing grade adjustments, determining if an adjustment in height or if the adjustment needs to be replaced. Rebuild and adjust, as necessary, the top of the manhole to bring the frame and cover to the required elevation.
 4. Replace grade adjustments that are loose, deteriorated, broken, or show structural defects. Replace adjustments that are constructed of brick, block, or materials other than those approved, as necessary. Adjustment rings placed on manholes to obtain proper grade shall be a minimum of 2-inches thick each, and shall not exceed a total vertical height of 12-inches. Minor adjustments, less than 2 inches, made with mortar shall not be paid for separately, but shall be an integral part of the replacement of the manhole frame and cover and/or any adjustments. Adjustments less than 12-inches shall be in accordance with specification Section 333921 "Manhole Grade Adjustments, Less Than 12 Inches". If the adjustment required to bring the manhole cover to the proper elevation is greater than 12-inches, adjustments shall be in accordance with specification Section 333920 "Manhole Grade Adjustments, Greater Than 12 Inches".
 5. Wire brush exposed manhole surfaces that will receive mortar, grout, or seals, to remove dirt and loose debris that may interfere with the bonding of such materials.
 6. Coat exposed manhole joint surfaces with an approved bonding agent, if required, followed with a thin as possible application of construction grade mortar to provide a smooth working surface and to rebuild and adjust, if necessary, the top of the manhole to the required elevation. Mortar used for minor adjustments in elevations shall not exceed a total height of 2 inches.
 7. Joint surfaces between the frame and adjustments, or the frame and chimney section, shall be free of dirt, stones, debris, and voids to ensure a watertight seal. Place a flexible butyl mastic gasket seal between the frame and manhole or adjustments, as recommended by manufacturer or as detailed. The sealing material shall extend far enough onto the frame to insure bonding and cover enough of the joint area to insure proper sealing. No steel shims, wood, stones, or any material not specifically accepted by the Engineer may be used to obtain final surface elevation of the manhole frame. Concrete grade rings shall be wrapped with joint wrap, as specified herein.
 8. Grout the perimeter of the new casting to the existing manhole chimney, cone, or adjustment with a cementitious non-shrink grout.
 9. The top of the casting, in paved areas, shall be set level with the existing, adjacent pavement surface elevation. Allowances for the compression of the joint material shall be made to assure a proper final grade elevation.
 10. Manhole rims in improved or unimproved lands shall be set to the elevation specified for such areas, as detailed in specification Section 333913, Part 3.1.I.
 11. Once the adjustments and frame are properly positioned and secured, backfill in accordance with specification Section 312333 "Trench Excavation, Backfill, and

- Compacting", for manholes in paved or non-paved areas. Backfill shall provide a uniform slope from the top of the manhole casting for not less than three-feet each direction to the existing finished grade of the ground.
12. Restore paved and non-paved surfaces as applicable and as specified in Division 32 of these Contract Documents. Adequately protect the surrounding area, that has been filled in whole or in part with concrete and/or asphalt, by appropriate control devices to allow the pavement(s) to properly cure prior to traffic resuming. Non-paved surfaces shall be restored to equal or better than original condition. Pavements shall be restored to match existing surrounding pavement. Restoration of all surfaces will not be paid for separately.
 13. Test and/or inspect the new manhole frame and cover as described herein. Test and/or inspect grade adjustments according to specification Sections 333920 or 333921.
- B. Contractor shall accurately record any additional work being performed, and shall notify the Engineer or his on-site representative of such work. The Engineer or his on-site representative shall approve all additional work or corrective actions before the work is performed or completed.
- C. For watertight frames and covers:
1. The bolts shall be installed as per the manufacturer's recommendations for the required ft/lbs of torque for tightening.
 2. All bolts threads and holes shall be clean at installation.
 3. There shall be no separate pay item for gaskets require at watertight casting installations.
- D. Remove and dispose of frames and covers if not retained by Owner. All undamaged, removed manhole rings and covers shall be considered as salvaged and shall remain the property of the Owner. The Contractor shall, upon removal of frame and cover, remove all grout from the salvaged frame and cover. The cover shall then be tied to the frame using a minimum of two (2) or more pieces of six (6) gauge wire and delivered to the Owner. Contractor shall deliver salvaged manhole rings and covers to a storage area as designated by the Owner.
- E. Do not backfill around manholes until adequate strength has been obtained from the manhole to support the backfill without damage to the manhole.
- F. All permits for street cuts and repairs shall be obtained by the Contractor.

3.5 TESTING

- A. Manhole frames, covers, seals, and other work defined in this section shall be visually inspected after installation to ensure that the frame seal is properly positioned, tight against the manhole and frame surfaces, that no voids or leakage points exist, that the manhole frame and cover is in good condition, and that the manhole casting is grouted appropriately. If the manhole frame, cover, seal, or other work does not pass the visual inspection, then at the contractor's option, the installations may be tested for leakage using a method approved by the Engineer. Deficiencies shall be corrected at the expense of the Contractor and shall not be eligible for separate or additional pay.
- B. Prior to backfilling, the section around the frame seal of all manholes in which the frame and cover is replaced shall be flooded with dyed water to insure water tightness.

END OF SECTION

SECTION 333913

SANITARY SEWER MANHOLES, FRAMES AND COVERS

PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish and install manholes and all appurtenances.
- B. Brick, masonry, and vitrified clay block manholes shall not be acceptable.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

PART 2 PRODUCTS

2.1 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 MANHOLE DIMENSIONS AND LAYOUT

- A. Manhole dimensions and layout shall be in accordance with details on the Drawings.
- B. The cone section height shall be 24-inches minimum and 30-inches maximum.
- C. Locate the manhole so that the centerlines of all pipes entering and leaving the manhole pass through the center of the manhole.

2.3 CONCRETE (CLASS "A")

- A. Concrete for cast-in-place and precast manholes shall be plant mixed concrete which is mixed and delivered in accordance with ASTM C94.
- B. Concrete shall have a 28-day compressive strength of 4,000 psi and shall contain not more than 6 gallons of water per sack of cement, including the water in aggregates, and contain a minimum of 6 sacks of Portland cement per cubic yard of concrete.
- C. Cement shall be Portland Cement Type 1 conforming to ASTM C150.
- D. Water used shall be clean, potable water and free from injurious amounts of oil, acids, alkalis, salt, sewage, dirt, organic matter, or other deleterious substances.
- E. Fine Aggregate: Fine aggregate shall consist of clean, sound, properly graded sand conforming to ASTM Standard C33 uniformly graded from 100% passing the 3/8 inch sieve to not more than 8% passing the No. 100 sieve.
- F. Coarse Aggregate: Coarse aggregate shall consist of crushed stone or gravel having soft

fragments, 1/4% by weight of clay lumps, and 1% by weight of material removed by decantation, except that when the material removed by decantation consists essentially of crushed dirt the maximum amount permitted may be increased to one and one-half percent by weight. Rocks shall conform to ASTM Standard D289. Coarse aggregate may be either of two sizes, 1 1/2 inch and smaller or 3/4 inch and smaller, and shall be graded within the following requirements.

Maximum size mesh screen (sq. mesh)	0-3% retained by weight
Half maximum size mesh screen (sq. mesh)	30-65% retained by weight
No. 4 sieve	94-100% retained by weight

- G. Slump: 3 to 4 inches.
- H. Air Content: 4 to 7 percent
- I. The concrete shall be delivered and placed within 1 hour after all materials including mixing water have been placed in the mixing drum.
- J. Concrete shall not be mixed and placed when a descending temperature is less than 40 degrees F or a rising temperature is less than 35 degrees F. Temperatures shall be taken in the forms or other points of concrete placement. Concrete shall not be placed when there is frost or ice on the forms. In the mixing of concrete, particles of frozen aggregates shall not be used. If the Contractor desires to overcome the stated temperature restrictions, he shall provide heating equipment adequate to maintain a temperature of not less than 40 degrees F. The Contractor shall be responsible for any defective work and shall replace any defective concrete work at his own expense.

2.4 CAST-IN-PLACE MANHOLES

- A. Manhole structures shall be constructed in the size and to the depth indicated on the Drawings and as shown in details on the Drawings. Manholes shall be job-cast of concrete specified above. Cast-in-place manholes shall be made of special purpose forms of steel or plastic specifically designed for manhole construction.
- B. Construction of poured in place manholes shall be a continuous pour; cold joints may be made only with prior approval of the Owner and Engineer.
- C. Minimum wall thickness shall be 6 inches for a 4 ft. diameter manhole and 8 inches for a 5 ft and 6 ft. diameter manhole.
- D. Manhole bottoms shall be of sufficient thickness that the thickness below the invert section shall be 6-inches minimum for 4 ft. diameter manholes, 8-inches minimum for 5 ft. diameter manholes and 12-inches minimum for 6 ft. diameter manholes.
- E. The top section or cone shall be concentric, unless otherwise approved by the Owner.
- F. Drop manholes shall be constructed at all manholes where the difference in invert elevation between incoming and outgoing sewer is 2 feet or more. Drop manholes shall be as shown on the Drawings.
- G. The exterior of all cold joints shall be sealed with 6" wide self priming, self sealing, permanently flexible, butyl based seal specifically designed to create a high performance seal in concrete structures. Sealant shall provide a flexible water-tight seal around perimeter of joint. Seal shall be highly resistant to temperature extremes and acid or caustic environments. Seal shall be BIDCO External Joint Wrap as manufactured by

Trelleborg or Infi-Shield Gator Wrap by Sealing Systems, Inc. no other equal.

2.5 MANHOLE FORMS

- A. Forms shall be constructed to the shape, form, lines, and grade as shown on the Drawings, and shall be maintained sufficiently rigid to prevent deformation or displacement under a load.
- B. Forms shall be constructed of any material having sufficient strength to permit a surface of satisfactory finish. They shall be sufficiently tight enough to prevent the escape of mortar in appreciable quantity.
- C. Forms shall be clean and oiled with form oil, designed for that purpose, before concrete is placed. Any reinforcing steel coated with form oil shall be thoroughly cleaned before concrete is placed.

2.6 REINFORCING STEEL

- A. Reinforcement shall be free from rust scale or other coatings that will destroy or reduce the bond.
- B. Where bars are used in concrete which shall remain in contact with earth surfaces, the bars shall be supported in position by framing, and by wire as needed, in such a manner that the supports shall not remain as protrusions through the surface of the concrete. Wire, where used, shall be cut off and pushed down into the concrete before the concrete has reached its initial set.
- C. Where concrete is poured on horizontal forms, bars shall be supported by metal chairs, designed for that purpose.
- B. Reinforcing steel shall be steel of 60,000 psi minimum yield strength, conforming to the following ASTM Standards:
 - 1. A 615, Standard Specification for Deformed Billet-Steel Bars for Concrete Reinforcement
 - 2. A 616, Standard Specification for Rail-Steel Deformed Bars for Concrete Reinforcement
 - 3. A 617, Standard Specification for Axle-Steel Deformed Bars for Concrete Reinforcement
 - 4. A 185, Specification for Welded Steel Wire Fabric for Concrete Reinforcement
- C. All reinforcing steel bars #3 (3/8" diameter) or larger shall be deformed bars conforming to these specifications. Plain (non-deformed) bars larger than 1/4" diameter shall not be used for reinforcing.
- D. The supplier of reinforcing steel shall furnish certification of compliance with these specifications.
- E. Reinforcement shall be shop bent, unless otherwise permitted by the Engineer. Reinforcement partially embedded in concrete shall not be bent. Should field bending of reinforcing bars be required, they shall be bent cold.
- F. Reinforcement shall be accurately placed according to the Drawings or as specified herein and adequately secured in position by concrete, metal, or other approved chairs, spacers, or ties.

- G. Reinforcement shall not be welded unless specifically permitted by the Engineer.
- H. Reinforcement shall be protected by the thickness of concrete as shown on the Drawings. Where dimensions are not shown, the thickness of concrete over the reinforcement shall be as follows:
 - 1. Where concrete is deposited against the ground without the use of forms, not less than 3 inches, except wire mesh reinforcement for concrete slabs which may be within 1 1/2 inches of the ground.
 - 2. Where concrete is to be exposed to the weather or to the ground but placed in forms, in slabs and wall not exposed to the ground or to the weather not less than 2 inches.
 - 3. In all other cases not less than 2 inches.

2.7 MANHOLE GASKETS

- A. Pipe penetrations through cast-in-place manhole walls and connections to existing manholes shall be provided with a watertight gasket or coupling system suitable for the size of pipe being installed.
- B. Manhole gaskets shall conform to ASTM C923.
- C. Manhole gaskets for cast-in-place manholes shall be Romac Style LCT, Fernco CMA or approved equal.
- D. Manhole connections to pre-cast manholes may be made with Kor-N-Seal pipe to manhole connectors, or approved equal.
- E. Manhole gaskets shall be installed in accordance with manufacturer's recommendations.

2.8 PRECAST MANHOLES

- A. Concrete shall have a minimum compressive strength of 4,000 psi.
- B. Manholes shall meet the requirements of ASTM C 478. Minimum wall thickness shall be 5-inches for 4 ft. diameter manholes, 6-inches for 5 ft. diameter manholes, and 7-inches for 6 ft. diameter manhole
- C. Cones shall be of the concentric type.
- D. Riser sections shall be of suitable dimensions to construct the finished manhole top to the elevation shown on the Drawings or as directed by the Engineer.
- E. Horizontal joints between sections shall be made using elastomeric, pre-lubricated gaskets. Gaskets shall remain workable over a wide temperature range and shall not shrink, harden, or oxidize upon aging. Gaskets shall meet the requirements of ASTM C443 and ASTM C 361. Gaskets shall be Tylox Superseal, Forsheda 114, or approved equal.
- F. The invert of the manhole shall be finished with flow channels as shown on the Drawings, and free of sharp edges.
- G. Manhole bottoms shall be of sufficient thickness that the thickness below the invert section shall be 6-inches minimum for 4 ft. diameter manholes and 8-inches minimum for

5 ft. and 6 ft. diameter manholes.

- H. Diameter: As indicated on Drawings.
- I. The interior annular space at horizontal joints shall be grouted after installation with non-shrink grout. The exterior annular space at horizontal joints shall be sealed with 6" wide self priming, self sealing, permanently flexible, butyl based seal specifically designed to create a high performance seal in concrete structures. Sealant shall provide a flexible water-tight seal around perimeter of joint. Seal shall be highly resistant to temperature extremes and acid or caustic environments. Seal shall be BIDCO External Joint Wrap as manufactured by Trelleborg or Infi-Shield Gator Wrap by Sealing Systems, Inc. no other equal.
- J. The outside of the ring and cover shall be grouted with non-shrink grout.
- K. Pipe penetrations through manhole walls shall be provided with a watertight elastomeric gasket and shall be sized for the outside diameter of the sewer pipe to be inserted into the manhole. Pipe penetration seals shall be of rubber or similar material conforming to ASTM C443 and C923. Seals shall be appropriate for type of pipe material used and shall be Kor-N-Seal, as manufactured by NPC, Inc. or A-Lok, as manufactured by A-Lok Products, Inc., or approved equal.
- L. Drop manholes shall be constructed at all manholes where the difference in invert elevation between incoming and outgoing sewer is 2 feet or more. Drop manholes shall be as shown on the Drawings.
- M. Grade Rings: Reinforced-concrete rings, 6 to 9-inch total thickness, to match diameter of manhole frame and cover.
- N. Manholes shall be internally lined with 16-24 mils of coal tar epoxy, carboline bitumastic 300M or equal, prior to deliver to the job site.

2.9 STANDARD MANHOLE RING AND COVER FOR 4 FT DIAMETER MANHOLES

- A. All manhole ring and covers for 4 ft. diameter manholes shall be heavy duty cast iron and non-perforated.
- B. Cover shall have the letters SANITARY SEWER permanently cast on the surface of the cover.
- C. Two closed pick holes with bars shall be cast into the cover for lifting.
- D. Ring and cover shall have a 23.5-inch diameter cover, 32-inch flange diameter, and a 22-inch diameter clear opening. Seat depth shall be 2-inches.
- E. Cover shall have a machined bearing surface to prevent rocking.
- F. Ring and cover shall be made in USA.
- G. Ring and cover shall be Model V1348-1 by East Jordan Iron Works, Inc., Model 1266 by Deeter Foundry, or approved equal.

2.12 MANHOLE STEPS

- A. Manholes shall not have steps.

2.13 MANHOLE RISER RINGS

- A. Manhole riser rings shall be compatible with the size and type of manhole cover with which it will be used.
- B. The throat section height shall not exceed 12-inches unless approved by Engineer. The throat section shall be defined as the distance from the bottom of the integral cast manhole ring to the top of the manhole cover.
- C. Manhole riser rings may be constructed of concrete, polyethylene, or approved equal.
- D. Manhole riser rings shall only be used with approval of Engineer.

2.14 CEMENTITIOUS NON-SHRINK GROUT

- A. Cementitious non-shrink grout for use in installing pipe at existing manhole structures and other places as designated to receive non-shrink grout shall be one specially formulated for stopping active infiltration and filling voids in manholes and similar locations. Grout mix shall provide a quick setting, volume stable, cementitious product suitable for patching the interior of manholes when mixed and applied according to the manufacturer's recommendations. Grout mix shall be Strong Seal QSR, Quadex Hyperform as manufactured by Quadex, Inc., or approved equal.
- B. Grout that has not been used within 30 minutes after water has been added shall not be used.

PART 3 EXECUTION

3.1 GENERAL

- A. Trench and backfill shall be in accordance with Section 312333 - Trench Excavation, Backfill, and Compacting.
- B. Install manholes for changes in direction or pipe diameter.
- C. Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction.
- D. Manhole structures shall be constructed to the size and to the depth as indicated on the Drawings and as shown in details on the Drawings.
- E. Form continuous concrete channels and benches between inlets and outlet. Form a flow channel in the bench for any services stubbed into the manhole the same as mains.
- F. Benches shall be shaped and sloped 1/2 inch per foot from the manhole barrel wall down to 1/2 of the inside pipe diameter.
- G. The entire diameter of each pipe entering the manhole shall be cut smooth with the inside surface of the manhole barrel and the invert shaped throughout from all inlet pipes to the outlet pipe.
- H. The flow channels in the invert shall be contoured to the inside diameter of all pipes entering and exiting the manhole. Flow channels shall have a positive slope between inlet and outlet pipes.

- I. Set manhole frame and cover top level. Tops of manholes shall be constructed 4 inches above finished grade in maintained lawn areas, 1 foot above finished grade in wooded areas, or at elevation shown on the Drawings. Set tops of manholes in paved areas flush with pavements, sidewalks, or other paved surface. Finish grade shall slope away from manholes located in paved surfaces.
- J. Manholes shall be backfilled evenly around it's perimeter after 48 hours of concrete curing time. Care shall be taken to compact all backfill to the top of the highest pipe entering the manhole. Backfilling and bedding shall be in accordance with these specifications and as shown on the Drawings.
- K. All manholes shall be watertight and shall show no visible evidence of infiltration.
- L. Extend all pipes entirely through the manhole wall so that a joint occurs approximately 6-inches, but not greater than 12-inches, outside the manhole wall.

3.2 CAST-IN-PLACE MANHOLE INSTALLATION

- A. Forms for poured in place manholes shall have cutouts to fit around the sewer pipe entering the manhole so that the form rests upon the concrete base. Inlet and outlet pipes shall be joined to the manhole with a concrete watertight manhole gasket as specified above. Forms shall provide a smooth finish when forms are removed.
- B. Should circumstances make a cold joint necessary, a formed groove (keyway) and reinforcing dowels shall be required in the top of the first placement for shear protection. In no case shall a cold joint be below the observed water table without prior approval of the Owner. Immediately before the second placement is made, the surface of the cold joint shall be thoroughly cleaned and wetted with a layer of mortar being deposited on the surface.
- C. Consolidate concrete with a tamping rod, vibrator or other approved method so that a dense void free mass is formed.
- D. The tops of manhole bases shall be struck off to reasonably true planes. All scum, debris, and excess water shall be removed from the surface and the surface given a wood float finish.
- E. The interior finish shall be smooth and free of fins or sharp edges.
- F. Exterior walls which will remain exposed in the completed work, shall be wetted thoroughly and rubbed with a medium grit carborundum stone finish, followed by a second rubbing with a finer carborundum stone to obtain a smooth texture and uniform color. Rubbing shall not be undertaken until the end of the curing period. A cement wash or plaster coat shall not be acceptable.
- E. Unexposed surfaces in the completed work shall be carefully struck off with no further finish.
- F. Defective concrete whether exposed or unexposed, shall be repaired or replaced as required by Owner and Engineer.
- G. Install rubber gaskets in the walls around all pipes.
- H. The exterior of all cold joints shall be sealed with 6" wide external joint wrap in accordance with manufacturer's instructions and details shown on the Drawings.

Wrapping shall occur after manhole has been cleaned and free of debris that would inhibit the seal.

3.3 PRECAST MANHOLE INSTALLATION

- A. The bottom section of precast manholes shall be manufactured as an integral part of the manhole base slab. Install remaining sections in a truly vertical plane.
- B. Fill space between pipe and periphery of cutout entirely with non-shrink grout. The interior annular space at horizontal joints shall be grouted after installation with non-shrink grout. Grout lifting eyes with non-shrink grout.
- C. The interior finish shall be smooth and free of fins or sharp edges.
- D. The interior finish shall be smooth and free of fins or sharp edges.
- E. Invert shall be constructed in accordance with details shown on the Drawings.
- F. External horizontal joints shall be sealed with 6" wide external joint wrap in accordance with manufacturer's instructions and details shown on the Drawings. Wrapping shall occur after precast manhole has been cleaned and free of debris that would inhibit the seal.

3.4 MANHOLE EXCAVATION

- A. Excavate the base area no larger than necessary to provide an adequate base.
- B. Dewater all excavations before starting any permanent construction. Manholes shall not be installed in water filled excavation.
- C. Provide sheeting and shoring as required.
- D. Provide a minimum of 12-inches between the outer surface of manholes and the excavation or shoring.
- E. If over excavation occurs, provide foundation stabilization material in accordance with Section 312333 of these Specifications or concrete poured monolithically with the base.

3.5 PLACING CONCRETE

- A. The concrete base shall be poured on undisturbed earth free from frost, ice, mud, and other detrimental substances. Prior to pouring the base, any water in the excavation shall be removed and the base poured in the dry.
- B. Concrete shall be placed monolithically between walls and base.
- C. The interior of forms shall be cleaned of all sawdust, chips, and other construction debris.
- D. Steel reinforcement shall be inspected and approved by the Engineer prior to placement of concrete. Runways for buggies or wheel barrows shall not be supported on the reinforcement.
- E. Concrete shall be placed in such a manner as to avoid segregation, and to avoid displacement of reinforcement. Concrete shall not be discharged through open chutes, except chutes in mixing plants or on mixer trucks. Concrete shall be deposited as closely

as feasible to its final position. Concrete shall not be dropped freely for distances greater than those specified as follows:

Bottom and top slabs of structures - 3 feet
Pipe Foundations - 3 feet
Bases of Manholes - 10 feet
Concrete Encasement - 10 feet

- F. Concrete shall be placed to the lines, grades, and sections shown on the Drawings or as directed by the Engineer. Care shall be exercised in the placing of concrete that the forms are not displaced. Honeycomb shall be prevented by proper manipulation and compaction of the concrete.
- G. Concrete shall not be placed in layers over 18 inches deep. The method and rate of placement shall be such that the top of the layer is kept fresh and the formation of cold joints is avoided. Each layer shall be compacted by mechanical internal vibrating equipment, supplemented by hand spading, rodding and tamping. Vibrators shall not be used to transport concrete inside forms over distances so great as to cause segregation.
- H. The use of form vibrators is not acceptable. Internal vibrators shall be capable of transmitting vibration to the concrete at frequencies not less than 4,500 impulses per minute. Duration of vibration shall be limited to the time necessary to provide satisfactory consolidation without causing segregation. Vibrators shall be applied in a substantially vertical position, penetrating the surface of previously placed layers so as to ensure bonding of the layers and prevention of cold joints, and at uniformly spaced points not further apart than the visible effectiveness for the vibrator. Vibration shall be supplemented by hand spading, rodding, and tamping. All concrete shall be vibrated, except the concrete in manhole bases and pipe foundations need not be vibrated if other methods produce satisfactory results.
- I. If a construction joint is required because of plant breakdown or other unforeseeable cause, the joint shall be formed in a manner approved by the Owner and Engineer. Joints shall be cleaned of all laitance, loose particles, and other debris before new concrete is placed. Cleaning shall be thorough, but shall not dislodge the embedded coarse aggregates. Joints shall be kept moist for a period of 4 days or until new concrete is placed thereon. Concrete shall be placed monolithically between construction joints.

3.6 MANHOLE FORM REMOVAL

- A. Forms shall be removed in such a manner that the concrete is not damaged. Forms shall not be removed prior to the periods of time as follows:

Exterior Walls - 48 hours
Interior Wall forms, if not support for top slab forms - 48 hours
Top Slab Forms - 7 days
- B. Form ties shall be broken off, or cut back, 1/4 inch and the resulting holes or depressions filled with mortar and struck off even with the concrete surface. This operation shall take place as the forms are removed.
- C. Honeycombing found to be present after the removal of forms shall be repaired as directed by the Engineer.

3.7 STUBOUTS

- A. Stubouts shall be constructed in the direction and shall be of the size as shown on the Drawings.
- B. Stubouts shall be bedded and backfilled as specified and shown on the Drawings for sewer pipe.
- C. Watertight caps shall be installed on the end of stubouts that are not connected to live services.
- D. Stubouts shall be pressure tested as specified for gravity sewers.

3.8 CONNECTIONS TO EXISTING MANHOLES

- A. The sewage flow through the existing manhole shall be controlled by temporary plugs or bypass pumping as necessary to facilitate the new connection and grouting for the manhole invert. The existing flow of sewage shall be maintained in a manner to prevent overflow or discharge of sewage onto the ground surface and prevent damage caused by excessive surcharge in upstream sewer mains and service connections.
- C. Cut opening in the wall of existing manhole of sufficient size to permit proper installation of the new pipe at the designated line and grade.
- D. Insert new pipe through wall of manhole with manhole gasket positioned around the pipe at the midpoint of the wall.
- E. The opening in the wall around the new pipe shall be filled with non-shrink grout and properly finished inside and outside with cement mortar, so that leakage does not occur.
- F. The invert of the existing manhole shall be chipped out and re-grouted with cement mortar as necessary to provide a smooth transition between the invert for the new pipe and the other pipes entering and leaving the manhole.

3.9 DROP MANHOLES

- A. Drop manholes shall be constructed at all manholes where the difference in invert elevation between incoming and outgoing sewer is 2 feet or more.
- B. Drop manholes shall be as shown on the Drawings.
- C. Pipe and fittings for drops shall be ductile iron.
- D. Encase the 90-degree bend in concrete as shown on the Drawings.

3.9 TESTING

- A. All new manholes shall be visually inspected during installation and before backfill, vacuum tested as specified below, and visually inspected after backfill and testing.
- B. All manholes shall pass a vacuum test in accordance with ASTM C1244 and as follows:
- C. Vacuum testing shall not be performed earlier than 7 days after construction or installation.

- D. Contractor shall provide all test equipment and perform the test under witness by the Engineer and authorities having jurisdiction.
- E. Manholes shall be tested using the vacuum testing procedure:
1. Vacuum test head shall be positioned at the inside surface of the concrete at the top of the cone section and the seal inflated in accordance with the equipment manufacturer's instructions.
 2. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump isolated by the shut-off valve on the test head connection.
 3. When valve is closed, time measurement shall commence, and the time required for vacuum drop to 9 inches of mercury shall be observed and recorded.
 4. The time measured for vacuum drop from 10 inches to 9 inches of mercury shall not be less than indicated in the following table.

Depth of Manhole (Feet)	Time in seconds for 1" Drop in Mercury		
	48" Diameter	60" Diameter	72" Diameter
<10	20	23	33
10'	25	33	41
12'	30	39	49
14'	35	46	57
16'	40	57	67
18'	45	59	73
20'	50	65	81
22'	55	72	89
24'	59	78	97
26'	64	85	105
28'	69	91	113
30'	74	98	121

5. Manholes showing greater than the allowable leakage shall be repaired and re-tested until a satisfactory leakage result is obtained.
- F. All manholes with leaks in excess of the above shall be repaired or replaced. All corrective work shall be approved by the Engineer.
- G. Repair or replace manholes failing the vacuum test and repeat testing until leakage is within allowances specified.

- H. The Engineer will visually inspect manholes during all phases of construction. The level of inspection is at the discretion of the Engineer and will be based partly on the Contractor's ability, experience, and past performance. All work not conforming to these Specifications and/or Drawings shall be corrected by the Contractor.

3.10 PIPE SEAL AT MANHOLE

- A. Seal of pipe at new or existing manholes will be inspected upon completion of each line segment and again at final inspection prior to final acceptance of the project. No visible leaks shall be allowed. Should a leak be present at any of the inspection times it will be the responsibility of the Contractor to stop the leak with a method approved by the Engineer. Any leaks discovered during the warranty period shall be repaired under the Warranty.

END OF SECTION

SECTION 333920

MANHOLE GRADE ADJUSTMENTS, GREATER THAN 12 INCHES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section describes the materials, equipment, tools, labor, and construction procedures for the removal and replacement, or installation, of manhole precast sections where existing manholes must be adjusted and raised more than 12 inches to bring the manhole frame and cover to the appropriate elevation. Manhole grade adjustments will be as determined in the field, during manhole rehabilitation work.
- B. Manhole adjustments less than 12 inches shall meet the requirements of specification Section 333921 "Manhole Grade Adjustments, Less Than 12 Inches".
- C. Refer to specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers" and/or the project drawings for manhole construction materials and methods not covered in this Section.
- D. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 "Measurement and Payment", item "Manhole Grade Adjustments, Greater than 12 Inches".

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

1.3 DEFINITIONS

- A. Chimney or Throat - The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.
- B. Cone or Corbel - That portion of the manhole structure which slopes downward and outward from the bottom of the manhole frame to the required barrel of the manhole or barrel diameter. "Corbel" refers to a section built of brick or block, while "cone" refers to a precast, fiberglass or plastic section.
- C. Barrel or Section – The barrel is the cylindrical portion of the manhole that typically maintains a consistent diameter, and runs from the Corbel or Cone down to the manhole bench at the bottom. The Barrel most typically consists of multiple precast sections sitting on top of each other.
- D. Manhole Cover/Lid – A removable, plate, made of cast iron, which fits flush within a manhole frame/ring and forms the lid over the opening of a manhole.
- E. Manhole Frame/Ring – The portion of the manhole that extends from the chimney up to the surface in which the manhole is installed, and holds the manhole cover.
- F. Manhole Frame Seal – A coating or sealing system that bridges the joint between the manhole frame and the manhole chimney, ensuring there is no water intrusion at that location.

- G. Bench – The additional concrete that is applied at the bottom of the manhole and shaped in such a way to direct and maintain the water flow into the associated pipes.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 – PRODUCTS

2.1 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 PRECAST MANHOLE SECTIONS

- A. Precast manhole sections shall be in accordance with specification section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.
- A. Replaced cones shall be of the concentric type, unless otherwise approved by the Engineer.
- B. Replaced sections shall be to the correct, field measured height so that the manhole top is at the approximate required elevation and shall be of such height as to minimize minor final grade adjustments.

2.3 MANHOLE GRADE ADJUSTMENT RISERS AND EXTENSION RINGS

- A. Manhole adjustment risers and extension rings shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.

2.4 BUTYL MASTIC SEALANT

- A. Butyl mastic sealant shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.
- B. The annular space between manhole sections, extension rings, adjustment risers, and manhole frames shall be sealed utilizing a flexible butyl mastic sealant material.

2.5 PRE-LUBRICATED JOINT GASKETS

- A. Horizontal joint gaskets shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.

2.6 MANHOLE EXTERIOR JOINT WRAP

- A. Exterior joint wrap shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.

2.7 HYDRAULIC NON-SHRINK GROUT (HYDRAULIC)

- A. Hydraulic non-shrink grout shall be "Rehabilitation Patching Material" as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Hydraulic non-shrink grout (patching material) shall be used in grouting interior spaces at joints of manholes, interior spaces at joints of adjustment riser rings, and other places as designated to receive hydraulic non-shrink grout.

2.8 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Non-shrink repair mortar shall be used for grouting and setting manhole ring and covers, flat annular spaces between extension rings, and other applicable repairs.

2.9 TOOLS AND EQUIPMENT

- A. The Contractor shall have the required tools and equipment necessary to facilitate the proper excavation and removal of existing manhole sections and as necessary for the installation of replacement concrete manhole sections and other rehabilitation products as described in this specification section.

PART 3 - EXECUTION

3.1 GENERAL

- A. General execution of work described herein shall be in accordance with the manufacturer's instructions and recommendations, as well as comply with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. The Contractor shall be responsible for supplying the required materials for the manhole grade adjustments described in this section, including the unloading, temporary storage, and transporting of the materials. Transportation, handling, storage, and protection of materials and equipment shall be as specified in Section 016000 "Materials and Equipment".
- C. Contractor shall conform to specification Section 010000 "Basic Requirements", in which is defined applicable general requirements for the project, including pre-construction activities, utility related requirements, environmental related requirements, construction responsibilities, administrative requirements, and post-construction procedures.
- D. Manhole steps shall not be allowed at new manhole sections.
- E. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction.
- F. The Contractor shall be responsible for cleaning paved streets that have been soiled by their construction efforts at the end of each day or within 24 hours after any notification.
- G. The Contractor shall maintain flow entering the manhole by blocking, diverting, or bypass pumping if the flow will affect proper application/installation, as specified in specification Section 010000 "Basic Requirements".

- H. Contractor is responsible for verifying all adjustment heights prior to delivery of manhole sections.
- I. Manhole rim elevations shall be set at paved areas and unpaved areas in accordance with specification 333913 "Sanitary Sewer Manholes, Frames, and Covers", Part 3.1.I.
- J. All external joint wrapping shall occur after manhole has been cleaned and free of debris that would inhibit the seal. The exterior surfaces of the frame base, and 4 inches below the top of the manhole cone shall be cleaned with a wire brush. A protective polyethylene cover shall be placed over the rehabilitation work when backfilling, following sealing of the frame to the manhole.
- K. The interior annular space at horizontal cold joints and joints between riser rings shall be grouted after installation with non-shrink grout.
- L. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- M. Surface drainage shall not be obstructed any longer than necessary and shall by no means be left obstructed overnight or for the weekend.

3.2 ACCESS TO MANHOLES

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "Basic Requirements" and as required by Malvern Water Works.
- B. Refer to Section 010000 Basic Requirements for required Public Notices.
- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.
- D. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.
- E. The Work included in this Project may require excavation and related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. The locations of all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts, and the Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service.
- F. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work which might endanger the existing utilities. If such utilities are damaged or impaired because

of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.

- G. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.

3.3 EXCAVATION

- A. Trenching and Excavation shall be in accordance with specification Section 312333 "Trench Excavation, Backfill, and Compacting".
- B. All of the pavement and/or dirt inside of the cut/area shall be removed to allow safe working conditions during the adjustment and restoration to the proper height or level. Place excavated material only within construction easement, or approved working area. The Contractor is responsible for disposal of excess excavated material off-site.
- C. Any excavation which remains open overnight shall be properly barricaded and lighted in accordance with OSHA standards to avoid injury to persons and property.
- D. Non-paved Areas: Excavate to expose the manhole cone and/or sections to be removed and replaced. Limit excavation to the minimum work area required.
- E. Paved Areas: Make a square or rectangular full depth saw-cut and remove the pavement by breaking out from the saw-cut toward the manhole. Do not use pavement breaking equipment in the saw-cut. Excavate around the frame and cover to an adequate depth that will allow the desired adjustments to be accomplished.
- F. Roots 4 inches or greater found during excavation shall be exposed but not severed and shall be wrapped in burlap to protect them while exposed. Roots 2 inches to 4 inches in diameter that are severed during construction shall be neatly trimmed and coated with a heavy coat of tree seal. In the event where major roots of smaller trees are damaged or severed, the Engineer may require the Contractor to consult with a qualified arborist to determine the proper method to protect trees.
- G. Do not obstruct private or public traveled roadways or streets.
- H. Gutters, ditches, and drainageways shall be kept clear or other satisfactory provisions shall be made for drainage.
- I. Joint surfaces between the frame and adjustment sections or cone section shall be free of dirt, stones, debris, and voids to ensure a watertight seal. If minor elevation adjustment is required to match the existing pavement surface, quick setting mortar shall be used to adjust the elevation.
- J. The interior annular space at horizontal cold joints and joints between riser rings shall be grouted after installation with non-shrink grout.

3.4 CONSTRUCTION METHODS

- A. When an adjustment with grade rings (also called the "transition" or "throat") exceeds the maximum specified transition height of 12 inches, the Contractor shall remove the existing rings, cone, and/or barrel section; then the rings, cone, and/or barrel section shall be replaced as required to raise the manhole top to the required elevation. Installation of manhole frames and covers shall be in accordance with specification Sections 333910 "Replacement of Manhole Frames and Covers", 333913 "Sanitary Sewer Manholes, Frames, and Covers", and as specified herein.

- B. The following requirements shall apply to manhole adjustments greater than 12 inches:
1. For an adjustment where a throat height with manhole riser rings would be greater than 12 inches, the corbel/cone shall be raised but is limited to a minimum height of 24 inches and a maximum height of 30 inches.
 2. For grade adjustments that require a throat section greater than 12 inches and a corbel/cone section greater than 30 inches, the manhole grade shall be adjusted by replacing the corbel/cone section and other manhole barrel sections.
- C. The diameter of new manhole sections shall be consistent with the existing diameter of the remaining manhole structure. The remaining structure shall be capable of supporting the newly constructed portions of the manhole.
- D. The adjustment of manhole elevations by the partial replacement of manhole sections may affect existing sewer lines, and work described herein shall include the replacement of 5 feet of existing sewer lines, as required. The sewer line materials and installation shall be in accordance with Section 333913. Pipe embedment and backfill shall be as specified in accordance with Division 32 of these specifications. Sewer line installation shall be generally as follows:
1. Install pipe stubs for future connections at locations, angles, evaluations, and materials as specified or as determined by the Engineer or his Representative.
 2. Install each pipe stub with the bell or joint of the pipe abutting to, or as close to, the manhole wall but not more than 2 feet from outside the manhole walls for future connections.
 3. Pipe connections and penetrations at manholes shall be permanently sealed, watertight connection, with non-shrink grout placed around voids and at pipe penetrations. The grout shall provide a smooth transition from the pipe to the manhole wall.
- E. Contractor shall accurately record any additional work being performed. The Contractor shall notify the Engineer if additional deterioration exists.
- F. Replacement or installation of manhole adjustments shall be generally performed as described herein. Manhole grade adjustments greater than 12 inches shall utilize materials as specified herein. Contractor is ultimately responsible for means and methods of the required work.
1. Install catch-basins, plugs, and/or safety equipment as required to prevent debris from entering the sewer mains. Bypass pump or block sewage, so flow is around manhole to be rehabilitated, as required.
 2. Manhole shall be thoroughly cleaned and loose debris removed prior to beginning rehabilitation.
 3. Contractor shall field verify actual height to raise manhole to grade.
 4. Excavate manhole to 1 foot below corbel/wall joint or as required.
 5. Remove frame and cover, clean and stockpile as salvage. Contractor shall, upon removal of frame and cover, remove all grout from frame and cover. Reasonable care shall be exercised to prevent unnecessary damage to the salvaged frames and covers. No additional payment will be made for this work.
 6. Separate and inspect the condition of grade adjustments. If the grade adjustments are loose, deteriorated, broken, made of block, brick, or unapproved materials, replace them in accordance with these specifications.
 7. Adjustments less than 12 inches shall be in accordance with Section 333921. For adjustments greater than 12 inches, proceed with the following general instructions.
 8. Lift corbel to remove from wall section. Contractor shall be responsible for repairing any damage to the remaining manhole structure that may occur during the execution of work described herein.

9. Wire brush exposed manhole surfaces to remove dirt and loose debris. Apply mortar or cement to provide a smooth working surface as thin as possible or to rebuild the exposed surface.
10. Add precast wall sections and/or corbel to bring manhole to grade. Use flat bottom precast sections for adjustments at manholes with existing brick walls that are to remain in place. The diameter of precast corbels or barrel sections shall be consistent with the existing remaining structure. Apply seal for joints with a butyl mastic sealant.
11. Grout the interior annular spaces at horizontal joints after installation.
12. Apply exterior joint wrap after installation. Wrapping shall occur after manhole has been cleaned and is free of debris that would inhibit the seal. Grout manhole sections lifting eyes as required. If minor elevation adjustment is required to match the existing pavement surface, a construction grade mortar shall be used to adjust the elevation.
13. Install castings and complete frame seal. Frame and cover shall be replaced with the same size frame and cover unless otherwise specified by the Engineer. Install new manhole frame and cover per specification Section 333910 "Replacement of Manhole Frames and Covers".
14. Prior to backfilling, replace any removed or damaged sewer pipe, matching the existing pipe diameter, with a minimum 5 feet of sewer pipe, stubbed-out to the point of connection to the existing sewer main.
15. Backfill in accordance with specification Section 312333 "Trench Excavation, Backfill, and Compacting". Allowances for the compression of the joint material shall be made to assure a proper final grade elevation.
16. Remove debris and construction materials from the site if not salvageable. Contractor shall deliver salvaged frames and cover to location indicated and approved by the Engineer and Owner. No additional payment shall be made for this work.
17. Restore paved and non-paved surfaces as specified in Section 333913 Part 3.1.I of these Contract Documents. Paved areas shall be adequately protected by control devices for a period of time that will allow the area to properly cure before allowing traffic to resume. Before any pavement restoration commences, pavement that has been undermined shall be removed to stable material by sawcut. No payment will be made for replacement of pavement outside of standard pay width due to excavating wider than the standard excavation width specified herein. Pavement joints shall not be placed in the vehicle wheel path.

3.5 INSPECTION AND TESTING

- A. The Engineer or his representative will inspect the project's manholes during all phases of construction. The level of inspection is at the discretion of the Engineer or his representative and will be based partly on the Contractors ability, experience, and past performance.
- B. Adjustments, barrel extensions, and frame seals shall be visually inspected, throughout construction and after all work, to ensure that the sections are properly sized and positioned, that seals are properly installed and watertight, and that no voids or leakage points exist. Any visual deficiencies found during inspections shall be addressed and reworked as necessary, by the Contractor, to the Engineer's satisfaction, at no additional cost to the Owner.
- C. Prior to backfilling, the section around the frame seal of all manholes in which the frame is adjusted shall be flooded with dyed water to insure water tightness.
- D. All materials used for work described in this section shall be inspected for condition, appropriate installation, leakage, and/or other obvious, visible signs of non-approved materials.

- E. If the installation does not pass visual inspection, then at the Contractor's option, the installation may be tested for leakage using a testing method approved by the Engineer.

END OF SECTION

SECTION 333921

MANHOLE GRADE ADJUSTMENTS, 12 INCHES OR LESS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This section describes the materials, equipment, tools, labor, and construction procedures for the removal and replacement, or installation, of manhole grade adjustment risers and extension rings where existing manholes must be raised, 12 inches or less, to bring the manhole frame and cover to the appropriate elevation. Manhole grade adjustments will be as determined in the field, during manhole rehabilitation work.
- B. Manhole adjustments greater than 12 inches shall meet the requirements of specification Section 333920 “Manhole Grade Adjustments, Greater Than 12 Inches”.
- C. Refer to specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers” and/or the project drawings for manhole construction materials and methods not covered in this Section.
- D. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 “Measurement and Payment”, bid item “Replacement of Manhole Frame and Cover” where work covered under the bid item shall include grade adjustment by adjustment rings for a throat height of 12 inches or less.
- E. When a manhole adjustment of less than 12 inches is required, all defective courses of brick adjustment rings or other damaged adjustment rings shall be removed, the manhole riser/throat shall be rebuilt to the proper grade, and the ring reset, as described herein.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

1.3 DEFINITIONS

- A. Chimney or Throat - The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.
- B. Cone or Corbel - That portion of the manhole structure which slopes downward and outward from the bottom of the manhole frame to the required barrel of the manhole or barrel diameter. “Corbel” refers to a section built of brick or block, while “cone” refers to a precast, fiberglass or plastic section.
- C. Barrel or Section – The barrel is the cylindrical portion of the manhole that typically maintains a consistent diameter, and runs from the Corbel or Cone down to the manhole bench at the bottom. The Barrel most typically consists of multiple precast sections sitting on top of each other.
- D. Manhole Cover/Lid – A removable, plate, made of cast iron, which fits flush within a manhole frame/ring and forms the lid over the opening of a manhole.

- E. Manhole Frame/Ring – The portion of the manhole that extends from the chimney up to the surface in which the manhole is installed, and holds the manhole cover.
- F. Manhole Frame Seal – A coating or sealing system that bridges the joint between the manhole frame and the manhole chimney, ensuring there is no water intrusion at that location.
- G. Bench – The additional concrete that is applied at the bottom of the manhole and shaped in such a way to direct and maintain the water flow into the associated pipes.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 - PRODUCTS

2.1 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 MANHOLE GRADE ADJUSTMENT RISERS AND EXTENSION RINGS

- A. Manhole adjustment risers and extension rings shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.
- B. Cracked or multiple piece pre-cast concrete grade adjustment rings will not be accepted.

2.3 BUTYL MASTIC SEALANT

- A. Butyl mastic sealant shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.
- B. The annular space between manhole sections, extension rings, adjustment risers, and manhole frames shall be sealed utilizing a flexible butyl mastic sealant material.

2.4 MANHOLE EXTERIOR JOINT WRAP

- A. Exterior joint wrap shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.
- B. Sealant shall provide a flexible water-tight seal around the exterior perimeter of the joint at manhole riser rings and/or at the joint at the riser ring and the manhole structure.

2.5 HYDRAULIC NON-SHRINK GROUT (HYDRAULIC)

- A. Hydraulic non-shrink grout shall be “Rehabilitation Patching Material” as specified in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.

- B. Hydraulic non-shrink grout (patching material) shall be used in grouting interior spaces at joints of manholes, interior spaces at joints of adjustment riser rings, and other places as designated to receive hydraulic non-shrink grout.

2.6 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Non-shrink repair mortar shall be used for grouting and setting manhole ring and covers, flat annular spaces between extension rings, and other applicable repairs.

2.7 TOOLS AND EQUIPMENT

- A. The Contractor shall have the required tools and equipment necessary to facilitate the proper excavation and removal of existing manhole sections and as necessary for the installation of replacement concrete manhole sections and other rehabilitation products as described in this specification section.

PART 3 - EXECUTION

3.1 GENERAL

- A. General execution of work described herein shall be in accordance with the manufacturer's instructions and recommendations, as well as comply with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. The Contractor shall be responsible for supplying the required materials for the manhole grade adjustments described in this section, including the unloading, temporary storage, and transporting of the materials. Transportation, handling, storage, and protection of materials and equipment shall be as specified in Section 016000 "Materials and Equipment".
- C. Contractor shall conform to specification Section 010000 "Basic Requirements", in which is defined applicable general requirements for the project, including pre-construction activities, utility related requirements, environmental related requirements, construction responsibilities, administrative requirements, and post-construction procedures.
- D. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction.
- E. The Contractor shall be responsible for cleaning paved streets that have been soiled by their construction efforts at the end of each day or within 24 hours after any notification.
- F. Manhole rim elevations shall be set at paved areas and unpaved areas in accordance with specification 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- G. All external joint wrapping shall occur after manhole has been cleaned and free of debris that would inhibit the seal. The exterior surfaces of the frame base, and 4 inches below the top of the manhole cone shall be cleaned with a wire brush. A protective polyethylene cover shall be placed over the rehabilitation work when backfilling, following sealing of the frame to the manhole.
- H. The interior annular space at horizontal cold joints and joints between riser rings shall be grouted after installation with non-shrink grout.

- I. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- J. Surface drainage shall not be obstructed any longer than necessary and shall by no means be left obstructed overnight or for the weekend.

3.2 MANHOLE ADJUSTMENTS

- A. Manhole riser rings shall be sealed with a butyl mastic type sealant to create a water tight seal between adjustment rings and between the manhole frame and riser rings.
- B. Existing grade adjustment rings constructed of pre-cast concrete may be reused provided they are not cracked and are in otherwise good condition.
- C. Existing grade adjustments rings that are constructed of brick, block, or materials other than as approved herein, shall be removed and replaced.
- D. Existing riser rings that are reused and reinstalled are not eligible for payment.
- E. To accommodate steep surface grades, non-uniform pre-cast adjustment rings may be manufactured so that they are 2 inches deep on one side and 3 inches deep on the opposite side.

3.3 ACCESS TO MANHOLES

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "Basic Requirements" and as required by Malvern Water Works.
- B. Refer to Section 010000 Basic Requirements for required Public Notices.
- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.
- D. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.
- E. The Work included in this Project may require excavation and related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. The locations of all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts, and the Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service.
- F. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work

which might endanger the existing utilities. If such utilities are damaged or impaired because of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.

- G. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.

3.4 EXCAVATION

- A. Trenching and Excavation shall be in accordance with specification Section 312333 "Trench Excavation, Backfill, and Compacting".
- B. All of the pavement and/or dirt inside of the cut/area shall be removed to allow safe working conditions during the adjustment and restoration to the proper height or level. Place excavated material only within construction easement, or approved working area. The Contractor is responsible for disposal of excess excavated material off-site.
- C. Any excavation which remains open overnight shall be properly barricaded and lighted in accordance with OSHA standards to avoid injury to persons and property.
- D. Non-paved Areas: Excavate to expose the manhole frame, cover, and adjustment to be removed and replaced or installed. Limit excavation to the minimum work area required.
- E. Paved Areas: Make a square or rectangular full depth saw-cut and remove the pavement by breaking out from the saw-cut toward the manhole. Do not use pavement breaking equipment in the saw-cut. Excavate around the frame and cover to an adequate depth that will allow the desired replacement and adjustment to be accomplished.
- F. Roots 4 inches or greater found during excavation shall be exposed but not severed and shall be wrapped in burlap to protect them while exposed. Roots 2 inches to 4 inches in diameter that are severed during construction shall be neatly trimmed and coated with a heavy coat of tree seal. In the event where major roots of smaller trees are damaged or severed, the Engineer may require the Contractor to consult with a qualified arborist to determine the proper method to protect trees.
- G. Do not obstruct private or public traveled roadways or streets.
- H. Gutters, ditches, and drainageways shall be kept clear or other satisfactory provisions shall be made for drainage.
- I. Joint surfaces between the frame and adjustment sections or cone section shall be free of dirt, stones, debris, and voids to ensure a watertight seal. If minor elevation adjustment is required to match the existing pavement surface, quick setting mortar shall be used to adjust the elevation.
- J. The interior annular space at horizontal cold joints and joints between riser rings shall be grouted after installation with non-shrink grout.

3.5 CONSTRUCTION METHODS

- A. Removal and replacement of riser rings for adjustment of manhole frames and covers shall be in accordance with specification Sections 333910 "Replacement of Manhole Frames and Covers", 333913 "Sanitary Sewer Manholes, Frames, and Covers", and as specified herein.
- B. Raising of manhole frames and covers by riser rings, for a throat height of 12 inches maximum, shall be generally performed as described herein. Contractor is ultimately responsible for means and methods of the required work.

1. Install catch-basins, plugs, and/or safety equipment as required to prevent debris from entering the sewer mains.
2. Manhole shall be thoroughly cleaned and loose debris removed prior to beginning rehabilitation.
3. Contractor shall field verify actual height to raise manhole to grade.
4. Excavate as required and as described in Part 3.2 above. Remove enough material to access all joints in existing adjustment grade rings. Excavate to approximately 6 inches below the bottom of the manhole throat section.
5. Remove frame and cover, clean and stockpile as salvage. Contractor shall, upon removal of frame and cover, remove all grout from frame and cover. Reasonable care shall be exercised to prevent unnecessary damage to the salvaged frames and covers. No additional payment will be made for this work.
6. Separate and observe the condition of the existing grade adjustments. If the grade adjustments are loose, deteriorated, broken, or show structural defects replace them in accordance with these Specifications.
7. Wire brush manhole frame and exposed manhole surfaces to remove dirt and loose debris. Apply mortar or cement to provide a smooth working surface as thin as possible or to rebuild and adjust, if necessary, the top of the manhole to required elevation.
8. Install castings and complete frame seal. Frame and cover shall be replaced with the same size frame and cover unless otherwise specified by the Engineer. Install new manhole frame and cover per specification Section 333910 "Replacement of Manhole Frames and Covers".
9. Backfill in accordance with specification Section 312333 "Trench Excavation, Backfill, and Compacting". Allowances for the compression of the joint material shall be made to assure a proper final grade elevation.
10. Remove debris and construction materials from the site if not salvageable. Contractor shall deliver salvaged frames and cover to location indicated and approved by the Engineer and Owner. No additional payment shall be made for this work.
11. Restore paved and non-paved surfaces as specified in Division 32 of these Contract Documents and specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers". Paved areas shall be adequately protected by control devices for a period of time that will allow the area to properly cure before allowing traffic to resume. Before any pavement restoration commences, pavement that has been undermined shall be removed to stable material by sawcut. No payment will be made for replacement of pavement outside of standard pay width due to excavating wider than the standard excavation width specified herein. Pavement joints shall not be placed in the vehicle wheel path.

3.6 INSPECTION AND TESTING

- A. The Engineer or his representative will inspect the project's manholes during all phases of construction. The level of inspection is at the discretion of the Engineer or his representative and will be based partly on the Contractor's ability, experience, and past performance.
- B. Adjustments, barrel extensions, and frame seals shall be visually inspected, throughout construction and after all work, to ensure that the sections are properly sized and positioned, that seals are properly installed and watertight, and that no voids or leakage points exist. Any visual deficiencies found during inspections shall be addressed and reworked as necessary, by the Contractor, to the Engineer's satisfaction, at no additional cost to the Owner.
- C. Prior to backfilling, the section around the frame seal of all manholes in which the frame is adjusted shall be flooded with dyed water to insure water tightness.

- D. All materials used for work described in this section shall be inspected for condition, appropriate installation, leakage, and/or other obvious, visible signs of non-approved materials.
- E. If the installation does not pass visual inspection, then at the Contractor's option, the installation may be tested for leakage using a testing method approved by the Engineer.

END OF SECTION

SECTION 333930

INTERNAL CHIMNEY SEALS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The work covered herein, includes but is not limited to, furnishing all labor, equipment, tools, materials, and supervision, and performing all work necessary to seal the manhole with an internal polymer chimney seal as specified herein. The work under this item includes the installation of internal, applied chimney sealing system to manholes through the frame joint area and the area above the manhole cone, including all extensions to the chimney.
- B. Work described herein may be in conjunction with work described in other specification sections, as defined on the Bid Form and referenced herein.
- C. Manholes designated for installation of internal chimney seals are shown on the Manhole Rehabilitation Summary in Appendix A.
- D. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 "Measurement and Payment" for details regarding measurement of work for payment.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.
- B. Manufacturer shall supply, in writing, certification that each of the Contractor and/or his representatives have been trained and are approved to install the proposed internal chimney seal system. This training and installation certification shall be included in the bid item(s) for internal manhole seals and shall be provided to the Engineer with the internal chimney seal submittal.
- C. The manufacturer's specifications for the materials and method for proposed installation of the proposed internal chimney seal system shall be submitted to the Engineer for review before sealing work commences.

1.3 DEFINITIONS

- A. Chimney or Throat - The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.
- B. Cone or Corbel - That portion of the manhole structure which slopes downward and outward from the bottom of the manhole frame to the required barrel of the manhole or barrel diameter. "Corbel" refers to a section built of brick or block, while "cone" refers to a precast, Fiberglass, or plastic section.
- C. Barrel or Section – The barrel is the cylindrical portion of the manhole that typically maintains a consistent diameter, and runs from the Corbel or Cone down to the manhole bench at the bottom. The Barrel most typically consists of multiple precast sections sitting on top of each other.

- D. Manhole Frame/Ring – The portion of the manhole that extends from the chimney up to the surface in which the manhole is installed, and holds the manhole cover.
- E. Manhole Frame Seal – A coating or sealing system that bridges the joint between the manhole frame and the manhole chimney, ensuring there is no water intrusion at that location.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof. Little Rock Water Reclamation Authority's specifications and standards shall govern if any conflicts arise between codes, standards, these project specifications, and the Little Rock Water Reclamation Authority's specifications and standards.

PART 2 - PRODUCTS

2.1 BUILD AMERICA, BUY AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 GENERAL

- A. Chimney seals shall be designed to provide a watertight, interior, flexible seal of the manhole chimney area.
- B. The seal shall be designed to prevent leakage of water into the manhole through the frame joint area and the area above the manhole cone, including all extensions to the chimney area, throughout its design life. Extension materials may include, but are not limited to, lifting rings, brick material, block material, precast concrete, or plastic material. Cleaning and preparation of these surface materials shall be as recommended by the chimney sealant manufacturer.
- C. The seal shall remain flexible, allowing repeated vertical movements of the frame due to frost lift, ground movement, or other causes, of up to 2 inches and/or repeated horizontal movement of the frame due to thermal movement of pavement or other causes of up to 1/2 inch.

2.3 INTERNAL MANHOLE SEALS

- A. The manhole sealing system shall conform to the physical requirements of ASTM D412.
- B. The final liner material shall be corrosion resistant with a flexible urethane resin coating to be applied to the inside wall of the entire chimney area as described herein.
- C. The product shall have the following minimum requirements:

1. Elongation (at break) (ASTM D412)	800%
2. Hardness (Durometer) (ASTM D2240)	75
3. Tensile strength (ASTM D412)	1150 psi (topcoat)
4. Adhesion strength (ASTM D903)	175 lb. l/in. (topcoat)
5. Water Absorption (ASTM D570)	0.05% by weight
6. Tear Resistance (ASTM D1004)	155 lb. l/in.

- D. Internal chimney seals shall be Flex-Seal Utility Sealant as manufactured by Sealing Systems Inc., Elastaseal as manufactured by Manhole Rehab. Inc., or approved equal.

2.4 TOOLS AND EQUIPMENT

- A. Internal Chimney Seals: The Contractor shall have the manufacturer's recommended tools and other equipment which may be necessary to prepare the surfaces of the manhole and apply the manhole chimney sealant.

PART 3 - EXECUTION

3.1 GENERAL

- A. General execution of work described herein shall be in accordance with the manufacturer's instructions and recommendations.
- B. The Contractor shall be responsible for supplying the required materials for the manhole chimney seal as described in this section, including the unloading, temporary storage, and transporting of the materials.
- C. Repair and rehabilitation activities at manhole shall be coordinated with other work required at the manhole which may affect any other repairs to be performed.
- D. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction. The Contractor shall remove and dispose of all debris collected from the cleaning or installation operations. Contractor shall install catch-basins, plugs, and/or safety equipment as required to prevent debris from entering the sewer mains.
- E. Chimney seals shall be installed in accordance with the manufacturer's specifications and recommendations regarding use of butyl caulk on the lower portion of the seal when installed in brick manholes.

3.2 ACCESS TO MANHOLES

- A. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, with work notification, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.

3.3 INSTALLATION

- A. Cleaning and reparation of surface should include sandblasting and/or wire brushing of surface. No water or moisture shall be introduced during the blasting procedure.
- B. Butyl mastic must be removed completely or covered with a cementitious coating material compatible with the chimney sealant system and as recommended by the sealant manufacturer.
- C. Thoroughly sandblast and clean the entire area to be coated plus 2 inches (or more) above and below the intended top coat area.

- D. After cleaning, Contractor shall ensure the contact surfaces for the seal are reasonably smooth, and free from excessive voids or defects. All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed.
- E. The Contractor shall not allow any sand or other removed materials to enter the sewer pipes during the cleaning and sandblasting activities.
- F. After sandblasting, air blast the entire area to remove any loose material that may have been deposited or is embedded in the substrate.
- G. When air blasting is finished, and if recommended by the manufacturer, wipe the entire surface to be coated with acetone wet wipes.
- H. The substrate surface must be dry and free of dust, loose debris, latencies, sand, dirt, oil, grease, bituminous coatings, paint coatings, and chemical contamination.
- I. The Contractor shall determine the number of manholes and vertical coverage requirements to allow accurate ordering of the internal, applied chimney seal system.
- J. Seal may require the proper mixing of agents, as recommended by the manufacture's instructions. Apply primer as recommended by manufacturer.
- K. Internal Chimney Seals: Utilizing materials as specified, the work shall be generally performed in the steps described as follows. Contractor is ultimately responsible for means and methods of the required work.
 - 1. Sandblast, clean, and repair or patch surface as required. Active leaks (infiltration) shall be sealed by a method as recommended by the chimney seal manufacturer and as specified in these Contract Documents, prior to installing the chimney seal. If the substrate surface is rough or irregular and will not provide an effective sealing surface, it shall be smoothed with a non-shrink quick set repair mortar or grout, designed for vertical and overhead use, as specified in Section 333913. Openings or gaps greater than ¼ inch should be filled with materials specified in Section 333913 or as recommended by the manufacturer. The use of any patching material and work will require the Contractor to contact the sealant manufacturer to determine the proper time required for the material to completely cure prior to installing the sealant system.
 - 2. Blast surface with clean air.
 - 3. Acetone wet wipe.
 - 4. Mix primer as recommended by manufacturer and apply accordingly. Primer must be applied to a dry surface and only to the prepared surface area. Brush apply primer. For grade adjustment ring application of primer, apply a thin layer 3 inches above the bottom of the frame and the entire adjustment ring area to 3 inches below the bottom ring.
 - 5. After allowing for proper drying of primer to occur, mix and apply sealant. Mix sealant at time when ready for application. Blend sealant using method recommended by manufacturer. This may require the use of at least a power drill with a paint mixer attachment. Ensure sealant is properly prepared and mixed. Mix may require a brief wait to achieve desired consistency.
 - 6. Apply sealant within time frame specified after primer application, as recommended by the manufacture. If sealant is to be applied after the recommended primer curing time frame, the primer may have to be re-activated per manufacturer instructions. Sealant may be applied by brush as evenly as possible over the entire chimney area that includes 2 inches above the frame joint area, 2 inches below the top of the manhole cone, and the area above the manhole cone including all extensions to the

chimney area. The manhole chimney sealing system shall have a minimum of 120 mil thickness for durability and resistance to elongation and tearing. Recommended mil thickness is directly related to the expansion associated within the territory's climate. Contractor shall verify mil thickness with chimney seal manufacturer. Brick manholes shall be sealed from the bottom 2 inches of the manhole casting to the second level of brick courses of the manhole chimney. Fill all gaps with sealant. Do not apply sealant to any unprimed area.

7. Perform any testing after manufacturer recommended cure time, which may be approximately 30-days. Schedule other rehabilitation work to allow proper cure time and to minimize Contractor down time. No additional pay shall be made to the Contractor due to cure times or application zone variances. Patching or stopping of infiltration within the application area shall be subsidiary to the internal chimney seal bid item.

3.4 INSPECTION AND TESTING

- A. Internal manhole frame-chimney sealant material shall be visually inspected after application to ensure the material has been applied to the proper location of the manhole and that the material has begun to take an initial cure or set prior to replacing the manhole cover.
- B. Chimney sealant system shall be visually inspected, throughout application and after all work, to ensure that system is properly applied. Any visual deficiencies found during inspections shall be addressed and reworked as necessary, by the Contractor, to the Engineer's satisfaction, at no additional cost to the Owner.

END OF SECTION

SECTION 333940

REHABILITATION OF MANHOLE BENCH, TROUGH, LOWER 18 INCHES, AND PIPE SEALS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section shall govern all work, materials, and tools required to construct and/or provide rehabilitation methods to rebuild or repair damages, eliminate active infiltration, fill voids, restore structural integrity, and provide corrosion protection to benches, troughs, inverts, bases, pipe seals, and lower 18 vertical inches (measured from the manhole base) of the manhole wall. Contractor shall supply all labor, materials, equipment, and apparatus not specifically mentioned herein or noted on the plans, but which are incidental and necessary to complete the work to rehabilitate manhole benches, troughs, inverts, bases, pipe seals, and lower 18 vertical inches of manhole wall. Work shall be completed to the requirements specified herein and to the satisfaction of the Engineer.
- B. Refer to specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers" and/or the project drawings for manhole construction materials and methods not covered in this Section.
- C. Manholes designated for rehabilitation of manhole benches, troughs, inverts, bases, pipe seals, and lower 18 vertical inches of manhole wall are listed on the Manhole Rehabilitation Schedule in Appendix A and shown on the Drawings.
- D. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 "Measurement and Payment" for details regarding measurement of work for payment.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

1.3 MANUFACTURER'S RECOMMENDATIONS

- A. Materials, additives, mixture ratios, and procedures utilized for the grouting process shall be in accordance with manufacturers' recommendations.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 – PRODUCTS

2.1 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 GENERAL

- A. Water used to mix products shall be clean, potable water.
- B. Materials for rehabilitation or repairs as specified herein shall be compatible with other repair and rehabilitation products specified for use.
- C. Products and materials used for rehabilitation and repairs shall not promote the corrosion of any steel with which it may have contact.
- D. Grouts and mortar that have not been used within 30 minutes, after mixed or after water has been added, shall not be used.
- E. Consult product manufacturer for recommendations when conditions are such that the choice is not clear on which grout and installation method shall be used for stopping very active infiltration. Engineer shall be notified of manufacturer recommendations and of any changes in the proposed system.

2.3 REHABILITATION GROUTING MATERIAL (FOR VERY ACTIVE INFILTRATION AND FILLING VOIDS)

- A. Grouting material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.4 REHABILITATION PATCHING MATERIAL (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Patching material shall be used for patching, filling, and repairing non-leaking holes, cracks, voids, and spalls in concrete and masonry. Patching material shall be used to fill voids to prevent pressure-injected grouts from escaping areas of application.

2.5 REHABILITATION INFILTRATION CONTROL MATERIAL (FOR MINOR INFILTRATION)

- A. Infiltration control material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Infiltration control grout shall be used to stop minor water infiltration and shall be specially formulated for leak control. The product shall be designed to stop flowing leaks in vertical and horizontal concrete and masonry surfaces.

2.6 REHABILITATION BENCH/TROUGH COATING MATERIAL

- A. Bench/Trough coating material ("Coating Material") shall be used to rehabilitate manhole benches, troughs, inverts, and bases with a cementitious product to restore structural integrity, repair damage, and to provide corrosion protection, where required or for work as designated by the Engineer.
- B. Coating material shall have the following minimum requirements:
 - 1. Compressive Strength (ASTM C109): >9,000 psi at 28 days
 - 2. Tensile Strength (ASTM C496): >800 psi at 28 days
 - 3. Flexural Strength (ASTM C293): >1,200 psi at 28 days
 - 4. Shrinkage at 90% Relative Humidity (ASTM C596): 0% at 28 days
 - 5. Bond (ASTM C882): >2,000 psi at 28 days

- 6. Density, When Applied: 140 ± 5 pcf
- 7. Freeze/Thaw (ASTM C666): 300 cycles no visible damage
- C. Coating material shall be made with pure fused aluminate aggregates and calcium aluminate cement and shall include alkaline-resistant fiberglass fibers.
- D. Coating material shall be StrongSeal® Bench Mix as manufactured by The Strong Company, or approved equal.

2.7 CHEMICAL GROUT

- A. Chemical grouting shall be pre-approved for use by the Engineer and shall only be eligible for use if other methods of infiltration and leak control fail to perform. Chemical grouting shall meet the requirements of ASTM F2414, "Standard Practice for Sealing Sewer Manholes Using Chemical Grouting".
- B. The Contractor shall submit the required information for the type of chemical grout that is proposed for use on this project. Depending on the specific application, either Acrylic or Acrylate Based Grout, or Urethane Based Grout, shall be furnished. The type of grout to be used shall be in accordance with the manufacturer's recommendation for the specific application of the project.
- C. Contractor shall provide a chemical sealant solution containing a principal chemical sealant constituent, initiator (trigger), and catalyst specifically recommended for the purpose of sealing in sanitary sewer lines and manholes. Chemical sealant constituent, initiator (trigger), and catalyst shall be compatible when mixed. Grout shall have the ability to tolerate dilution and cure in the presence of water. Chemical grout shall produce a continuous, irreversible, impermeable stiff material and shall not be rigid or brittle.
- D. The chemical grout shall exhibit the following properties:
 - 1. Ability to adjust conditions, with additives or chemicals, for catalyzing reactions, controlling reaction times and shrinkage, lowering the freezing temperature of the grout, providing reinforcement strength, inhibiting root growth, and adding fillers.
 - 2. Resistance to chemicals, to most organic solvents, mild acids, alkali, and other similar constituents which are found at sanitary sewer manholes.
 - 3. The grout shall be non-toxic in its cured form.
 - 4. The material shall be able to withstand freeze/thaw and moving load conditions.
 - 5. Sealing material shall be non-corrosive.
- E. Additives and chemical sealant constituents shall be compatible when mixed with grout components and shall be supplied by the same manufacturer.
- F. Chemical grout shall have a controllable reaction time, from ten seconds to one hour, at temperatures ranging from ambient to freezing.
- G. Carrier material for chemical grout: For use in situations where other methods do not perform, where a void is greater than 1/4" or where water is actively flowing from a void, use a product suitable as a carrier material to hold grout in the desired location while grout cures. Carrier material shall be a strong fibrous jute, free of oils and tars.

2.9 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.10 ROOT INHIBITOR

- A. All present root growth will be removed from area designated for repairs, rehabilitation, or lining, prior to allocation of grout or patching materials. Special attention should be used during the cleaning operation to remove roots from the joints. Chemical root treatment shall be used before or following the root removal operation, depending on the manufacturer's recommendation. The Contractor shall capture and remove all roots from manholes.
- B. The application of the root inhibitor to the roots shall be done in accordance with the manufacturer's recommendations and specifications in such a manner to preclude damage to surrounding vegetation. Any damaged vegetation, so designated by the Engineer or Owner, shall be replaced by the Contractor at no additional cost to the Owner. All safety precautions as recommended by the manufacturer shall be adhered to for handling and application of any root inhibitor.
- C. A root inhibiting chemical such as dichlobenil shall be utilized at any area on manhole benches, troughs, invert, bases, pipe seals, and lower 18 vertical inches of manhole wall, where roots are removed prior to repairs.
- D. Root inhibitor shall be applied at a safe level of concentration, and as recommended by the manufacturer.
- E. Root inhibitor shall have the ability to remain active within the grout for a minimum of 12 months.
- F. Deviations from these specifications shall be noted clearly on the submittal for Root Inhibitor products.
- G. Root inhibitors shall be Avanti AC-50W Root Inhibitor, by Avanti, or approved equal.

2.11 ADDITIVES

- A. Grout additions may be utilized for catalyzing the gel reaction, inhibiting the gel reaction, buffering the solution, lowering the freezing temperature of the solution, acting as filler, providing strength or for inhibition of root growth.

2.12 TOOLS AND EQUIPMENT

- A. The Contractor shall have the required tools and equipment necessary to facilitate the proper repair and rehabilitation of manhole benches, troughs, invert, bases, pipe seals, and lower 18 vertical inches of manhole wall, as described herein and as recommended by the material supplier. Equipment manufactured by the material supplier for product installation shall be used if specifically required for proper application of material.

PART 3 – EXECUTION

3.1 GENERAL

- A. Materials shall be mixed and applied in accordance with manufacturers' recommendations.
- B. Repair and rehabilitation activities at manhole benches, troughs, invert, bases, pipe seals, and lower 18 vertical inches of manhole wall, shall be coordinated with other work required at manhole which may affect any other repairs to be performed.

- C. All cracked or deteriorated material shall be removed from the area to be patched, and replaced with the appropriate material, as specified in Part 2 above.
- D. The Contractor shall maintain flow entering the manhole by blocking, diverting, or bypass pumping if the flow will affect proper application/installation, as specified in specification Section 010000 "Basic Requirements". Blocking or diverting of active inflow, with pumping around as required, shall be incidental to the work defined in this specification.
- E. Contractor shall conform to specification Section 010000 "Basic Requirements", in which is defined applicable general requirements for the project, including pre-construction activities, utility related requirements, environmental related requirements, construction responsibilities, administrative requirements, and post-construction procedures.
- F. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction. The Contractor shall remove and dispose of all debris collected from the cleaning operation.
- G. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- H. The Contractor shall conduct operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, and to adjacent property owners or tenants.
- I. Contractor shall comply with all relevant provisions of Safety and Health Regulations for Construction. Specific attention is directed to OSHA safety rules, regulations, and precautions to be taken by the Contractor before entering sanitary sewer manholes with respect to physical and chemical hazards which may be present. Contractor shall ventilate interior and exterior application areas, and all occupied spaces adjacent to application areas, during the application of products specified herein, such as grout.
- J. The manhole benches, troughs, inverts, bases, pipe seals, and lower 18 vertical inches of manhole wall shall be rehabilitated and finished in such a manner so that a watertight seal exists between the manhole walls, pipes, bench/trough areas, and other joined surfaces.
- K. Install materials in accordance with safety and weather conditions required by the manufacturer and/or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Normal grouting operations including application of interior coating shall be performed at temperatures of 40F or greater. If grouting is performed below temperatures of 40F, then it must be performed in accordance with manufacturer's recommendations.
- L. Any private property element or structure that is removed for access to the manhole shall be replaced by the Contractor to existing or better condition, to the satisfaction of the property owner and the Engineer, and in accordance with the Contract Documents.

3.2 ACCESS TO MANHOLES

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "Basic Requirements" and as required by Malvern Water Works.
- B. Refer to Section 010000 Basic Requirements for required Public Notices.

- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.
- D. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, with work notification, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.
- E. The Work included in this Project may require related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. The locations of all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts. The Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service, as required by the rehabilitation work at manholes.
- F. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work which might endanger the existing utilities. If such utilities are damaged or impaired because of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.
- G. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.

3.3 MATERIALS AND METHODS OF REPAIRS

- A. Manholes to be repaired may be of brick, pre-cast or poured concrete construction, fiberglass, corrugated metal, or plastic.
- B. Filling of large voids, cracks, holes, and other non-infiltrating penetrations in the manhole bench, trough, invert, bases, and walls, shall be completed by the hand application of quick setting patching material as defined herein. Patching materials and repairs shall not commence until infiltration or any leaks are properly sealed and manhole area re-cleaned.
- C. Minor, active leaks in benches, troughs, or repair areas associated with this specification section, shall be stopped using quick-setting, high-early-strength, hand applied specially formulated infiltration control mixes, as defined herein. Some leaks may require weep holes to localize the infiltration during the application of the infiltration control mix. When severe infiltration exists, and the infiltration control mix is not sufficient to stop the leak, only then shall drilling be allowed for pressure grouting (chemical injection), as defined herein. No additional payment shall be made for the use of pressure grouting (chemical injection) methods over hand applied infiltration control mixes. Rehabilitation of manhole walls and corbel shall be paid as defined on the Bid Form and in the Measurement and Payment specification of these Contract Documents.
- D. Diverting and/or blocking of active inflow shall be incidental to the work defined in this specification.

3.4 REHABILITATION PATCHING GROUT (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching grout shall be hand or trowel placed, applying pressure and holding in position until material remains in place.
- B. This grout shall be used for filling large voids, cracks, and areas around incoming pipelines, and shall be used to fill voids to prevent applied pressure-injected grouts from escaping.
- C. Material shall be troweled uniformly onto damaged invert and/or trough at a minimum thickness of ½-inch, at the invert and/or trough extending out onto the bench, base, or wall of the manhole. Patching material shall be used to repair damage at any bench, trough, invert, base and/or bottom 18-vertical inches of manhole. Pipe seals to be repaired and grouted (and if the manhole is not being rehabilitated with a cementitious liner) shall be prepared, sealed, and grouted. All infiltration around the pipe seals shall be stopped.
- D. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.

3.5 REHABILITATION INFILTRATION CONTROL GROUT (FOR MINOR INFILTRATION)

- A. Apply as a dry or very thick paste by hand or trowel. Hold material in place to allow the infiltrating liquid to set the mix. Some leaks may require weep holes to localize infiltration during the application. After application, weep holes shall be plugged with the patching material as described herein.
- B. This grout shall be used to stop minor water infiltration and shall be specially formulated for leak control.
- C. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.

3.6 CHEMICAL GROUT APPLICATION

- A. Contractor shall deliver materials to job site in undamaged, unopened containers bearing manufacturer's original labels. Materials used as chemical grout shall be transported, stored, mixed, and applied in a manner recommended and as detailed in published data provided by manufacturer.
- B. Additives shall be provided in accordance with the grout manufacturers recommendations and installation instructions, in quantities as specified.
- C. Mixing and handling of chemical grout, which may be toxic under certain conditions, shall be done in such a manner as to minimize any hazard to personnel and shall be in accordance with the manufacturer's recommendations. It is the responsibility of the Contractor to provide appropriate protective measures to ensure that chemicals are handled only by trained and authorized personnel.
- D. All equipment used to install the grout shall be as recommended by the manufacturer and only personnel familiar with the grouting material and meeting the qualifications required, shall perform the actual grouting operation. All equipment used to install materials shall be as recommended by the manufacturer and only personnel thoroughly familiar with all aspects of the grouting material shall perform the actual grouting operation.
- E. The chemical grout shall be applied so as to have the grout material flow freely into the defects, with the minimum set time established so that adequate grout travel is achieved.

- F. Injection holes shall be drilled through the manhole at locations recommended by the manufacturer. Provide injection holes near observed defects. Provide a minimum three injection holes at 120-degree angles from each other on the same plane of elevation. Rows shall be separated no more than three vertical feet, and the holes shall be staggered with the holes in the rows above and below.
- G. Do not drill directly into a crack unless concrete is less than 6-inches thick, or if offset drilling is not possible. Concrete 6-inches thick or less may require drilling injection holes directly into cracks to properly seal them. For concrete 6-inches thick or less, drill the injection holes deeper than 2-inches but not more than 5-inches deep, to expose a larger area of crack surface to the materials. Surface sealing the crack may be required. For concrete greater than 6-inches thick, drill injection holes deep enough to assure intersection with the crack.
- H. Drill one or two injection holes on the right or left side of the crack. These first injection holes are injection test holes to determine which side of the crack should be sealed first and how far materials will travel along the crack. Only the water pump should be charged and ready to pump for test holes. Do not fill the material pump, or open pails of grout, until after the test hole pumping.
- I. The spacing between the holes is critical, and is a function of crack width. The tighter the crack, the closer the holes. Typically, holes will be spaced $1\frac{1}{2}$ times the distance that the test water travels.
- J. Grout shall be injected through the holes under pressure with suitable probe, injection packer, and/or wall spear, as recommended by the grout manufacturer. Injection pressure shall not cause damage to the manhole structure or surrounding surface. Grout shall be injected through the lowest holes first and at the lowest point on the crack possible. Injection holes shall be drilled at 45-degree angles to intersect a crack halfway into the concrete. The procedure shall be repeated until the area is sealed as required.
- K. Grouting from the ground surface shall not be allowed.
- L. Grout travel shall be verified by observation of grout to defects or adjacent injection holes. Provide additional injection holes, if necessary, to ensure grout travel.
- M. Injection holes shall be cleaned with a drill and waterproof patched with a quick setting commercial grade grout or patching material, as recommended by the chemical grouting manufacturer.

3.6 CONSTRUCTION METHODS

- A. Contractor shall provide schedules to the Engineer as required showing which manholes that the Contractor will be working on in the near future.
- B. The existing deteriorated bench, trough, invert, base, pipe seals, and bottom 18-vertical inches of manhole shall be completely rehabilitated. Repairs shall be performed on all benches, troughs, inverts, bases, pipe seals, and bottom 18-vertical inches of manhole designated for work in Appendix A and as shown on the Drawings. Care must be taken to avoid damaging other areas of the manhole structure not in need of repair or already rehabilitated.
- C. Cleaning and preparation of the manholes shall be done in accordance with the rehabilitation system manufacturer's recommendations. Utilize materials as specified. *Contractor is ultimately responsible for means and methods of the required work.*
- D. In the absence of any recommendations, the work shall be generally performed as follows:

1. Contractor shall be responsible for plugging, diverting, or redirecting the flow of wastewater, as needed, for repair and rehabilitation of manholes and shall be incidental to the work defined in this specification.
 - a. Place covers over inlets and outlets to prevent extraneous material from entering the sewer lines before cleaning.
 - b. Any construction related material that enters the sewer mains shall be removed and properly disposed of by the Contractor, at no additional cost to the Owner.
2. After blocking flow through the manhole, the manhole bench (to 1 foot above the bench), trough, invert, base, pipe seals, and 3 feet of wall above the base, shall be cleaned as required for the work to be performed. Care shall be taken to avoid damage to other parts of the manhole structure.
 - a. All foreign material including but not limited to dirt, chemicals, previous coatings, sludge, mineral deposits, and debris shall be removed from the manhole bench, trough, invert, base, and lower 18 inches of manhole wall using steam, a high-pressure water spray (minimum of 3500 psi), wire brush, light duty chipping hammer, and/or grinding wheel, as necessary to provide a clean substrate contact material. Prepare and clean pipe seals as required for application of rehabilitation products.
 - b. When grease and oil are found in the manhole, an approved detergent, chemical cleaning compound, or muriatic acid may be used with the high-pressure water blast. All surfaces using these methods shall be thoroughly rinsed, scrubbed, neutralized, and tested, in order to confirm the removal of all cleaning agents and their reactant products.
 - c. If deemed necessary, and with the approval by the Engineer, use of an abrasive sand blast or sand-assisted water blast may be used to clear all debris from the original substrate.
 - d. Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper, to expose a sound sub-base.
 - e. If reinforcing steel is exposed, either before or after removing deteriorated concrete, it shall be thoroughly cleaned to remove all contamination and rust particles.
 - f. The Contractor shall cut and remove all roots within the area of the bench, trough, invert, base, lower 18 inches of wall, and pipe seals that may interfere with adequate repair and rehabilitation.
 - g. Air blast after all debris removal, with oil free compressed air, to remove any remaining wear or loose sand and grit.
3. All materials resulting from cleaning shall be removed prior to application of rehabilitation materials and/or coatings. The debris is to be disposed of properly in accordance with all regulations.
4. After the reinforcing steel is cleaned and prepared, the Contractor shall place a protective, corrosion inhibiting product on the exposed reinforcing steel, prior to any sealing of leaks, patching, or other repair work. The protective coating shall be approved by the Engineer and applied in accordance with the manufacturers' recommendations.
5. A root inhibitor, either as an additive to grouts, mortars, and patching materials or as a stand-alone product, shall be utilized at all repair sites in relation to the bench, trough, invert, base, lower 18 inches, and pipe seals. Contractor shall consult with root inhibitor and rehabilitation product manufacturers to determine the best method of application of the root inhibitor.

6. Seal active leaks within manhole at bench, trough, invert, base, lower 18 inches, and pipe seals prior to the application of mortars and patching materials, either by plugging with a hydraulic cement or chemical grout sealing.
 - a. Active leaks shall be stopped using quick setting, specially formulated infiltration control mixes as specified and according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application. After application, the weep holes shall be plugged with the infiltration control mix as specified prior to the application of any patching materials and coatings.
 - b. When severe infiltration exists, and the infiltration control mix is not sufficient to stop the leak, only then shall drilling be allowed for chemical grout sealing/pressure grouting by chemical injection, as defined herein. Additional payment shall ***not*** be made for the use of pressure grouting/chemical injection methods over hand applied infiltration control mixes and plugging with hydraulic cements. Manufacturer's recommendations shall be followed when chemical/pressure grouting is required.
7. After sealing of leaks, clean manhole areas again. All materials resulting from cleaning shall be removed prior to application of patching materials. Inspect the areas to be grouted or patched to assure that the surfaces are clean and wet. Repair and patch manhole inverts and troughs, seal pipe seals, patch and seal the bottom 18 vertical inches of the manhole walls, and rebuild benches that have visible damage present. All holes and/or voids, joints or pipes, spalled areas, and cracks shall be patched with rapid-setting patching material, as specified herein. Application of patching materials shall be completed by hand application. After thoroughly cleaning, the quick-setting patch material shall be applied in an expeditious manner. Trowel mix uniformly onto damaged area at a minimum thickness of ½ inch, extending sufficiently out onto the base of the manhole to tie into the structurally sound, remaining portions of the manhole.
 - a. Invert/Trough: All troughs and inverts shall follow the grades of the pipe entering the manhole. The invert/trough shall be shaped smooth throughout, contoured to the inside diameter of all pipes entering and exiting the manhole. Flow channels shall have a positive slope between inlet and outlet pipes. The invert depth at the flow line shall be approximately one-half the pipe diameter. The invert/trough area of the manhole shall be finished with flow channels.
 - b. Bench: The bench shall be repaired such that a gradual slope is produced from the walls to the invert/trough. The patching material shall be applied up onto the wall a minimum of 2-inches. The wall bench intersection shall be rounded to a uniform radius equal to the full circumference of the intersection. Benches shall be shaped and sloped ½-inch per foot from the manhole barrel wall down to ½ of the inside pipe diameter.
 - c. Finished surfaces not to be lined shall be smooth and free of ridges. Inverts shall be U-shaped and have a minimum depth of 1/2 pipe diameter. Benches shall have smooth surfaces without defects that allow debris to accumulate.
 - d. Where seal cracks and openings greater than 1/8" occur at the manhole bench, trough, invert, pipe seals, base, or bottom 18 vertical inches, the area shall be repaired by chipping out a minimum depth and width of ¾" to provide mechanical key for patching material. Patch, grout, repair manhole base, bottom 18 inches, and pipe seals to stop infiltration, prohibit root growth, and repair damage.
 - e. The surface of the patching material is to be troweled to assure that material penetrates voids and sets the bond to the substrate.

- 8. All missing mortar shall be repointed using a non-shrink cement mortar, as specified herein, and applied as recommended by the manufacturer.
- 9. Flow may be reestablished in the manhole in accordance with the manufacturer's recommendations.
- E. The thicknesses of the patches, grouting, coatings, etc. on bottom 18 inches of the wall must form a uniform, vertical surface. Other patched, grouted, coated, etc. materials shall be formed to a smooth, even surface.
- F. Care shall be taken to prevent the degradation or damage of newly rehabilitated and repaired benches, troughs, inverts, bases, pipe seals, and bottom 18 vertical inches of manhole wall.

3.7 TESTING AND INSPECTIONS

- A. All manholes in which the bench, trough, invert, base, pipe seals, and bottom 18 vertical inches have been repaired shall be visually inspected.
- B. The bench, trough, invert, base, pipe seals, and bottom 18 vertical inches shall be rehabilitated such that a watertight seal exists in the repaired areas.
- C. Testing shall not be performed on a specific manhole until all work as shown on the Manhole Rehabilitation Schedule has been completed for that specific manhole.
- D. Any rehabilitated manholes that are observed to be leaking by the Engineer shall be subject to additional repairs and testing at no additional cost to the Owner. The Contractor shall only be responsible for repairs of those work items completed by the Contractor in accordance with the Bid Form.

END OF SECTION

SECTION 333950

REHABILITATION OF MANHOLE WALLS AND CORBEL

PART 1 – GENERAL

1.1 SCOPE

- A. This section governs all work, materials, and testing required for the repair of defects to rehabilitate manhole walls and corbels and the removal and patching of manhole steps, as described herein. Manholes designated for rehabilitation of walls and corbels, and those designated for manhole step removal and patching, are shown on the Manhole Rehabilitation Schedule in Appendix A and/or are designated on the Drawings. The Contractor shall be responsible for the furnishing of all labor, supervision, materials, and equipment required to complete all manhole rehabilitation work as specified herein.
- B. This section includes, but is not limited to, the following for rehabilitation of manhole walls and corbels: elimination of active infiltration, repair and filling of voids and cracks, removal and disposal of unsound construction material, cleaning and surface preparation for rehabilitation methods, removal and patching of manhole steps, grouting of any lifting holes, grouting of joints as noted, root removal, testing, and any other related or incidental work as may be required to provide rehabilitated manhole walls and corbels.
- C. Refer to specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers” and/or the project drawings for manhole construction materials and methods not covered in this Section.
- D. Manholes designated for rehabilitation of walls, corbels, and removal/patching of steps/step holes and lifting holes, are listed on the Manhole Rehabilitation Schedule in Appendix A and shown on the Drawings.
- E. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 “Measurement and Payment” for details regarding measurement of work for payment.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.

1.3 MANUFACTURERS RECOMMENDATIONS

- A. Materials, additives, mixture ratios, and procedures utilized for the grouting process shall be in accordance with manufacturers' recommendations.

1.4 DEFINITIONS

- A. Chimney or Throat - The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.
- B. Cone or Corbel - That portion of the manhole structure which slopes downward and outward from the bottom of the manhole frame to the required barrel of the manhole or barrel diameter. “Corbel” refers to a section built of brick or block, while “cone” refers to a precast, fiberglass or plastic section.

- C. Barrel or Section – The barrel is the cylindrical portion of the manhole that typically maintains a consistent diameter, and runs from the Corbel or Cone down to the manhole bench at the bottom. The Barrel most typically consists of multiple precast sections sitting on top of each other.
- D. Manhole Cover/Lid – A removable, plate, made of cast iron, which fits flush within a manhole frame/ring and forms the lid over the opening of a manhole.
- E. Manhole Frame/Ring – The portion of the manhole that extends from the chimney up to the surface in which the manhole is installed, and holds the manhole cover.
- F. Manhole Frame Seal – A coating or sealing system that bridges the joint between the manhole frame and the manhole chimney, ensuring there is no water intrusion at that location.
- G. Bench – The additional concrete that is applied at the bottom of the manhole and shaped in such a way to direct and maintain the water flow into the associated pipes.

1.5 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Water used to mix products shall be clean, potable water.
- B. Materials for rehabilitation or repairs as specified herein shall be compatible with other repair and rehabilitation products specified for use.
- C. Products and materials used for rehabilitation and repairs shall not promote the corrosion of any steel with which it may have contact.
- D. Grouts and mortar that have not been used within 30 minutes, after mixed or after water has been added, shall not be used.
- E. Consult product manufacturer for recommendations when conditions are such that the choice is not clear on which grout and installation method shall be used for stopping very active infiltration. Engineer shall be notified of manufacturer recommendations and of any changes in the proposed system.

2.3 BUY AMERICAN, BUILD AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.3 REHABILITATION GROUTING MATERIAL (FOR VERY ACTIVE INFILTRATION AND FILLING VOIDS)

- A. Grouting material shall be in accordance with specification Section 333913 “Sanitary Sewer Manholes, Frames, and Covers”.

- B. Grouting material shall be used for filling voids (in porous soils) behind substrates for leak and subsidence control, and for stopping very active infiltration. Apply required products to restore structural integrity of substrate prior to using any pressure-injection grouting.

2.4 REHABILITATION PATCHING MATERIAL (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Patching material shall be used for patching, filling, and repairing non-leaking holes, cracks, voids, and spalls in concrete and masonry. Patching material shall be used to fill voids to prevent pressure-injected grouts from escaping areas of application.

2.5 REHABILITATION INFILTRATION CONTROL MATERIAL (FOR MINOR INFILTRATION)

- A. Infiltration control material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Infiltration control grout shall be used to stop minor water infiltration and shall be specially formulated for leak control. The product shall be designed to stop flowing leaks in vertical and horizontal concrete and masonry surfaces.

2.6 CHEMICAL GROUT

- A. Chemical grout shall be approved by the Engineer and shall only be eligible for use if other methods of infiltration and leak control fail to perform. Chemical grouting shall meet the requirements of ASTM F2414, "Standard Practice for Sealing Sewer Manholes Using Chemical Grouting".
- B. The Contractor shall submit the required information for the type of chemical grout that is proposed for use on this project. Depending on the specific application, either Acrylic or Acrylate Based Grout, or Urethane Based Grout, shall be furnished. The type of grout to be used shall be in accordance with the manufacturer's recommendation for the specific application on the project.
- C. Contractor shall provide a chemical sealant solution containing a principal chemical sealant constituent, initiator (trigger), and catalyst specifically recommended for the purpose of sealing in sanitary sewer lines and manholes. Chemical sealant constituent, initiator (trigger), and catalyst shall be compatible when mixed. Grout shall have the ability to tolerate dilution and cure in the presence of water. Chemical grout shall produce a continuous, irreversible, impermeable stiff material and shall not be rigid or brittle.
- D. The chemical grout shall exhibit the following properties:
 - 1. Ability to adjust conditions, with additives or chemicals, for catalyzing reactions, controlling reaction times and shrinkage, lowering the freezing temperature of the grout, providing reinforcement strength, inhibiting root growth, and adding fillers.
 - 2. Resistance to chemicals, to most organic solvents, mild acids, alkali, and other similar constituents which are found at sanitary sewer manholes.
 - 3. The grout shall be non-toxic in its cured form.
 - 4. The material shall be able to withstand freeze/thaw and moving load conditions.
 - 5. Sealing material shall be non-corrosive.
- E. Additives and chemical sealant constituents shall be compatible when mixed with grout components and shall be supplied by the same manufacturer.

- F. Chemical grout shall have a controllable reaction time, from ten seconds to one hour, at temperatures ranging from ambient to freezing.
- G. Carrier material for chemical grout: For use in situations where other methods do not perform, where a void is greater than ¼" or where water is actively flowing from a void, use a product suitable as a carrier material to hold grout in the desired location while grout cures. Carrier material shall be a strong fibrous jute, free of oils and tars.

2.7 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be as specified in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.8 ROOT INHIBITOR

- A. All present root growth will be removed from area designated for repairs, rehabilitation, or lining, prior to allocation of grout or patching materials. Special attention should be used during the cleaning operation to remove roots from the joints. Chemical root treatment shall be used before or following the root removal operation, depending on the manufacturer's recommendation. The Contractor shall capture and remove all roots from manholes.
- B. The application of the root inhibitor to the roots shall be done in accordance with the manufacturer's recommendations and specifications in such a manner to preclude damage to surrounding vegetation. Any damaged vegetation, so designated by the Engineer or Owner, shall be replaced by the Contractor at no additional cost to the Owner. All safety precautions as recommended by the manufacturer shall be adhered to for handling and application of any root inhibitor.
- C. A root inhibiting chemical such as dichlobenil shall be utilized at any area on the manhole bench, trough/inverts, and bottom of the manhole, where roots are removed prior to repairs.
- D. Root inhibitor shall be applied at a safe level of concentration, and as recommended by the manufacturer.
- E. Root inhibitor shall have the ability to remain active within the grout for a minimum of 12 months.
- F. Deviations from these specifications shall be noted clearly on the submittal for Root Inhibitor products.
- G. Root inhibitors shall be Avanti AC-50W Root Inhibitor, by Avanti, or approved equal.

2.9 ADDITIVES

- A. Grout additions may be utilized for catalyzing the gel reaction, inhibiting the gel reaction, buffering the solution, lowering the freezing temperature of the solution, acting as filler, providing strength or for inhibition of root growth.

2.10 TOOLS AND EQUIPMENT

- A. The Contractor shall have the required tools and equipment necessary to facilitate the proper repair and rehabilitation of manhole walls and corbels, as described herein and as recommended by the material supplier. Equipment manufactured by the material supplier for product installation shall be used if specifically required for proper application of material.

PART 3 - EXECUTION

3.1 GENERAL

- A. Materials shall be mixed and applied in accordance with manufacturer's recommendations.
- B. Repair and rehabilitation activities at manhole walls and corbels shall be coordinated with other work required at manhole which may affect any other repairs to be performed.
- C. All cracked or deteriorated material shall be removed from the area to be patched, and replaced with the appropriate material, as specified in Part 2 above.
- D. The Contractor shall maintain flow entering the manhole by blocking, diverting, or bypass pumping if the flow will affect proper application/installation, as specified in specification Section 010000 "Basic Requirements". Blocking or diverting of active inflow, with pumping around as required, shall be incidental to the work defined in this specification.
- E. Contractor shall conform to specification Section 010000 "Basic Requirements", in which is defined applicable general requirements for the project, including pre-construction activities, utility related requirements, environmental related requirements, construction responsibilities, administrative requirements, and post-construction procedures.
- F. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction. The Contractor shall remove and dispose of all debris collected from the cleaning operation.
- G. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- H. The Contractor shall conduct operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, and to adjacent property owners or tenants.
- I. Contractor shall comply with all relevant provisions of Safety and Health Regulations for Construction. Specific attention is directed to OSHA safety rules, regulations, and precautions to be taken by the Contractor before entering sanitary sewer manholes with respect to physical and chemical hazards which may be present. Contractor shall ventilate interior and exterior application areas, and all occupied spaces adjacent to application areas, during the application of products specified herein.
- J. Install materials in accordance with safety and weather conditions required by the manufacturer and/or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Normal grouting operations including application of interior coating shall be performed at temperatures of 40F or greater. If grouting is performed below temperatures of 40F, then it must be performed in accordance with manufacturer's recommendations.
- K. Any private property element or structure that is removed for access to the manhole shall be replaced by the Contractor to existing or better condition, to the satisfaction of the property owner and the Engineer, and in accordance with the Contract Documents.
- L. Contractor shall remove all manhole steps, at manholes identified in the Manhole Rehabilitation Schedule provided in Appendix A and as shown on the Drawings. Contractor shall patch holes where steps are removed, with material as specified in Part 2.

- M. Seal all unsealed lifting holes, unsealed step holes, precast manhole section joints or cold joints, and voids with material specified in Part 2.
- N. Grouting should only be performed on a structurally sound manhole unless the grout is used to prevent water from entering the manhole during application of a lining or coating system. All structural repairs, adjustments to the frame and cover, and installation of grade rings shall be completed prior to beginning the grouting operations of manhole walls and corbels.

3.2 ACCESS TO MANHOLES

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "General Requirements" and as required by Malvern Water Works.
- B. Refer to Section 010000 Basic Requirements for required Public Notices.
- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.
- D. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, with work notification, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.
- E. The Work included in this Project may require related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. The locations of all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts. The Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service, as required by the rehabilitation work at manholes.
- F. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work which might endanger the existing utilities. If such utilities are damaged or impaired because of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.
- G. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.

3.3 MATERIALS AND METHODS OF REPAIRS

- A. Manholes to be repaired may be of brick, pre-cast, or poured concrete construction.
- B. Filling of large voids, cracks, holes, lifting holes, step holes, joints, and other non-infiltrating penetrations in the manhole wall and corbel, shall be completed by the hand application of quick setting patching material as defined herein. Patching materials and repairs shall not commence until infiltration or any leaks are properly sealed and manhole area re-cleaned.

- C. Minor, active leaks in walls and corbels shall be stopped using quick-setting, high-early-strength, hand applied specially formulated infiltration control mixes, as defined herein. Some leaks may require weep holes to localize the infiltration during the application of the infiltration control mix. When severe infiltration exists, and the infiltration control mix is not sufficient to stop the leak, only then shall drilling be allowed for pressure grouting (chemical injection), as defined herein. No additional payment shall be made for the use of pressure grouting (chemical injection) methods over hand applied infiltration control mixes. Rehabilitation of manhole walls and corbel shall be paid as defined on the Bid Form and in the Measurement and Payment specification of these Contract Documents.
- D. Diverting and/or blocking of active inflow shall be incidental to the work defined in this specification.

3.4 REHABILITATION PATCHING GROUT (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching grout shall be hand or trowel placed, applying pressure and holding in position until material remains in place.
- B. This grout shall be used for filling large voids, cracks, and areas around incoming pipelines, and shall be used to fill voids to prevent applied pressure-injected grouts from escaping. All wall lift holes to be repaired and plugged (and the manhole is not being rehabilitated with a cementitious liner) shall be prepared, sealed, and grouted. All infiltration around the manhole wall lift holes shall be stopped.
- C. Material shall be troweled uniformly onto damaged substrate at a minimum thickness of ½-inch. Patching material shall be used to repair damage at manhole walls, corbels, and other areas that are exhibiting infiltration.
- D. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.
- E. The thicknesses of the patches must form a uniform, vertical wall established from the manhole bench to the manhole cone section.

3.5 REHABILITATION INFILTRATION CONTROL GROUT (FOR MINOR INFILTRATION)

- A. Apply as a dry or very thick paste by hand or trowel. Hold material in place to allow the infiltrating liquid to set the mix. Some leaks may require weep holes to localize infiltration during the application. After application, weep holes shall be plugged with the patching material as described herein.
- B. This grout shall be used to stop minor water infiltration and shall be specially formulated for leak control.
- C. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.

3.6 CHEMICAL GROUT APPLICATION

- A. Contractor shall deliver materials to job site in undamaged, unopened containers bearing manufacturer's original labels. Materials used as chemical grout shall be transported, stored, mixed, and applied in a manner recommended and as detailed in published data provided by manufacturer.

- B. Additives shall be provided in accordance with the grout manufacturers recommendations and installation instructions, in quantities as specified.
- C. Mixing and handling of chemical grout, which may be toxic under certain conditions, shall be done in such a manner as to minimize any hazard to personnel and shall be in accordance with the manufacturer's recommendations. It is the responsibility of the Contractor to provide appropriate protective measures to ensure that chemicals are handled only by trained and authorized personnel.
- D. All equipment used to install the grout shall be as recommended by the manufacturer and only personnel familiar with the grouting material and meeting the qualifications required, shall perform the actual grouting operation. All equipment used to install materials shall be as recommended by the manufacturer and only personnel thoroughly familiar with all aspects of the grouting material shall perform the actual grouting operation.
- E. The chemical grout shall be applied so as to have the grout material flow freely into the defects, with the minimum set time established so that adequate grout travel is achieved.
- F. Injection holes shall be drilled through the manhole at locations recommended by the manufacturer. Provide injection holes near observed defects. Provide a minimum three injection holes at 120-degree angles from each other on the same plane of elevation. Rows shall be separated no more than three vertical feet, and the holes shall be staggered with the holes in the rows above and below.
- G. Do not drill directly into a crack unless concrete is less than 6-inches thick, or if offset drilling is not possible. Concrete 6-inches thick or less may require drilling injection holes directly into cracks to properly seal them. For concrete 6-inches thick or less, drill the injection holes deeper than 2-inches but not more than 5-inches deep, to expose a larger area of crack surface to the materials. Surface sealing the crack may be required. For concrete greater than 6-inches thick, drill injection holes deep enough to assure intersection with the crack.
- H. Drill one or two injection holes on the right or left side of the crack. These first injection holes are injection test holes to determine which side of the crack should be sealed first and how far materials will travel along the crack. Only the water pump should be charged and ready to pump for test holes. Do not fill the material pump, or open pails of grout, until after the test hole pumping.
- I. The spacing between the holes is critical, and is a function of crack width. The tighter the crack, the closer the holes. Typically, holes will be spaced 1½ times the distance that the test water travels.
- J. Grout shall be injected through the holes under pressure with suitable probe, injection packer, and/or wall spear, as recommended by the grout manufacturer. Injection pressure shall not cause damage to the manhole structure or surrounding surface. Grout shall be injected through the lowest holes first and at the lowest point on the crack possible. Injection holes shall be drilled at 45-degree angles to intersect a crack halfway into the concrete. The procedure shall be repeated until the area is sealed as required.
- K. Grouting from the ground surface shall not be allowed.
- L. Grout travel shall be verified by observation of grout to defects or adjacent injection holes. Provide additional injection holes, if necessary, to ensure grout travel.
- M. Injection holes shall be cleaned with a drill and waterproof patched with a quick setting commercial grade grout or patching material, as recommended by the chemical grouting manufacturer.

3.7 CONSTRUCTION METHODS

- A. Contractor shall provide schedules to the Engineer as required showing which manholes that the Contractor will be working on in the near future.
- B. The existing deteriorated walls, corbels, and other corresponding areas shall be completely rehabilitated. Repairs shall be performed on all manhole walls, corbels, and other areas as designated for work in Appendix A and as shown on the Drawings. Care must be taken to avoid damaging other areas of the manhole structure not in need of repair or already rehabilitated. Promptly inform Engineer of errors or discrepancies between the contract documents and the field conditions found, in order that changed conditions can be evaluated and revised directives issued in a timely manner.
- C. Cleaning and preparation of the manholes shall be done in accordance with the rehabilitation system manufacturer's recommendations. Utilize materials as specified, the work shall be generally performed as follows. *Contractor is ultimately responsible for means and methods of the required work.*
- D. Contractor shall remove all manhole steps, and restore surface, at manholes identified in the Manhole Rehabilitation Schedule provided in Appendix A and as shown on the Drawings. Contractor shall patch holes where steps were removed with appropriate material, as specified in Part 2.
- E. Seal all unsealed lifting holes with appropriate material described in Part 2.
- F. In the absence of any recommendations, the following steps should be performed:
 - 1. Contractor shall be responsible for plugging, diverting, or redirecting the flow of wastewater, as needed, for repair and rehabilitation of manholes and shall be incidental to the work defined in this specification.
 - a. Place covers over inlets and outlets to prevent extraneous material from entering the sewer lines before cleaning.
 - b. Any construction related material that enters the sewer mains shall be removed and properly disposed of by the Contractor, at no additional cost to the Owner.
 - 2. After blocking flow through the manhole, the manhole shall be thoroughly cleaned. Care shall be taken to avoid damage to other parts of the manhole structure.
 - a. All foreign material including but not limited to dirt, chemicals, previous coatings, sludge, mineral deposits, and debris shall be removed from the manhole bench and trough using steam, a high-pressure water spray (minimum of 3500 psi), wire brush, light duty chipping hammer, and/or grinding wheel, as necessary to provide a clean substrate contact material.
 - b. When grease and oil are found in the manhole, an approved detergent, chemical cleaning compound, or muriatic acid may be used with the high-pressure water blast. All surfaces using these methods shall be thoroughly rinsed, scrubbed, neutralized, and tested, in order to confirm the removal of all cleaning agents and their reactant products.
 - c. If deemed necessary, and with the approval by the Engineer, use of an abrasive sand blast or sand-assisted water blast may be used to clear all debris from the original substrate.
 - d. Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper, to expose a sound sub-base. Remove all loose or defective brick, grout, steps, protruding ledges, or other loose debris from the patching area. Removal shall consist of neatly cutting steps flush with the wall prior to any sealing or patching. The Contractor

- shall be responsible for proper disposal of steps.
- e. If reinforcing steel is exposed, either before or after removing deteriorated concrete, it shall be thoroughly cleaned to remove all contamination and rust particles.
 - f. The Contractor shall cut and remove all roots within the area of the wall and corbel that may interfere with the adequate repair of the wall and/or corbel.
 - g. Air blast after all debris removal, with oil free compressed air, to remove any remaining wear or loose sand and grit.
- 3. All materials resulting from the cleaning of the bench and trough shall be removed prior to application of patching materials and/or coatings. The debris is to be disposed of properly in accordance with all regulations.
 - 4. After the reinforcing steel is cleaned and prepared, the Contractor shall place a protective, corrosion inhibiting product on the exposed reinforcing steel, prior to any sealing of leaks, patching, or other repair work. The protective coating shall be approved by the Engineer and applied in accordance with the manufacturers' specifications.
 - 5. A root inhibitor, either as an additive to grouts, mortars, and patching materials or as a stand-alone product, shall be utilized at all repair sites in relation to the walls and/or corbel.
 - 6. Inspect each manhole to determine methods of stopping leaks and applying patch repairs. First, seal active leaks and infiltration within manhole prior to the application of mortars and patching materials, either by plugging with a hydraulic cement or chemical grout sealing. Sealing of leaks usually begins with grouting the lowest leaks first, the moving higher until the manhole is sealed from leaks and infiltration.
 - a. Active leaks in walls, corbel, or other areas applicable to this area of work shall be stopped using quick setting, specially formulated infiltration control mixes as specified and according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application. After application, the weep holes shall be plugged with the infiltration control mix as specified prior to the application of any patching materials and coatings.
 - b. When severe infiltration exists, and the infiltration control mix is not sufficient to stop the leak, only then shall drilling be allowed for chemical grout sealing/pressure grouting by chemical injection, as defined herein. Additional payment shall **not** be made for the use of pressure grouting/chemical injection methods over hand applied infiltration control mixes and plugging with hydraulic cements. Manufacturer's recommendations shall be followed when pressure grouting is required.
 - 7. After sealing of leaks, clean manhole areas again. All materials resulting from the cleaning of the structure shall be removed prior to application of patching materials. Inspect the areas to be grouted or patched to assure that the surfaces are clean and wet. Repair and patch manhole areas in walls and corbel that have visible damage present. All holes, joints, pipes, spalled areas, and cracks shall be patched with rapid-setting patching material, as specified herein. Seal all unsealed lifting holes, unsealed step holes, precast manhole section joints, and voids larger than approximately one-half (1/2) inch in thickness. Application of patching materials shall be completed by hand application.
 - a. Finished surfaces not to be lined shall be smooth and free of ridges. Inverts shall be U-shaped and have a minimum depth of 1/2 pipe diameter.

- b. Where seal cracks and openings greater than 1/8" occur at the manhole walls and corbel area shall be repaired by chipping out a minimum depth and width of 3/4" to provide mechanical key for patching material.
 - e. The surface of the patching material is to be troweled to assure that material penetrates voids and sets the bond to the substrate.
- 8. All missing mortar shall be repointed using a non-shrink cement mortar, as specified herein, and applied as recommended by the manufacturer.
- 9. Caution should be taken to minimize exposure of applied product to sunlight and air movement. If application of additional coats is to be longer than 15 minutes, the structure shall be covered. At no time should the finished product be exposed to sunlight or air movement for longer than 15 minutes before covering or closing access.
- 10. Flow may be reestablished in the manhole in accordance with the manufacturer's recommendations.
- G. The thicknesses of the patches, coatings, etc. must form a uniform, vertical wall established from the manhole bench to the manhole cone section.
- H. Care shall be taken to prevent the degradation or damage of newly rehabilitated and repaired walls and corbels.
- I. Any private property element or structure that is removed for access to the manhole shall be replaced by the Contractor to existing or better condition to the satisfaction of the property owner.

3.8 TESTING OF REHABILITATED MANHOLES

- A. All manholes in which the wall and corbel have been repaired shall be visually inspected.
- B. The wall and corbel shall be rehabilitated such that a watertight seal exists in the repaired wall and/or corbel area.
- C. Testing shall not be performed on a specific manhole until all work as shown on the Manhole Rehabilitation Schedule has been completed for that specific manhole.
- D. Any rehabilitated manholes that are observed to be leaking by the Engineer shall be subject to additional repairs and testing at no additional cost to the Owner. The Contractor shall only be responsible for repairs of those work items completed by the Contractor in accordance with the Bid Form.

END OF SECTION

SECTION 333960

REHABILITATION OF SANITARY SEWER MANHOLES (CEMENTITIOUS COATING)

PART 1 - GENERAL

1.1 SCOPE

- A. This section governs all work, materials, and testing required for the rehabilitation of sanitary sewer manholes. The Contractor shall be responsible for the furnishing of all labor, supervision, materials, and equipment required to complete all manhole rehabilitation work as specified herein.
- B. Manhole rehabilitation procedures will involve flow control, removal and replacement of manhole ring and cover, raising manhole ring and cover to grade, cleaning and surface preparation for existing manhole to be sprayed, removal and disposal of any debris and/or loose and unsound material, elimination of active infiltration prior to liner application, repair and patching of voids and joints, repair and sealing of pipes, inverts and benches, structural rebuilding as required, spray application of a cementitious mix to form a structural monolithic liner, surface restoration, testing, and other related and incidental work as may be required to provide completely sealed, patched, and lined manholes acceptable to Owner and Engineer.
- C. Liner: The Contractor approved and trained by the manufacturer, shall furnish all labor, equipment, and materials for applying a cementitious mix to form a structural monolithic liner of a minimum of ½-inch thickness with machinery specifically designed for the application. All aspects of the installation shall be in accordance with the manufacturer's recommendation and per these specifications.
- D. Method and items of rehabilitation shall be as shown on the Manhole Rehabilitation Summary Sheets in the Appendix.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.
- B. Submit documentation of previous manhole rehabilitation work. Submit a list of a minimum of three (3) recently completed manhole rehabilitation projects including project name and location, names of owner and engineer, description of products used, and application procedures.
- C. Submit written and dated certification stating Contractor is factory trained and approved by the manufacturer for application of the specified products.
- D. Submit a list of key supervisory personnel that will be working on the project. Provide a resume for each of the key supervisory personnel that includes their experience with the proposed products, including specific projects and their responsibilities, and their history with the Contractor submitting the bid. Key supervisory personnel shall have a minimum of 3 years of experience installing the proposed product. Key supervisory personnel shall be on-site when work is being performed on the project. The Engineer shall be notified in writing when there is any change in key supervisory personnel.

1.3 MANUFACTURERS RECOMMENDATIONS

- A. Materials, mixture ratios, and procedures utilized for the coating process shall be in

accordance with manufacturers' recommendations.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 - PRODUCTS

2.1 BUILD AMERICA, BUY AMERICA ACT

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure Investment and Jobs Act (IIJA)/Bipartisan Infrastructure Law (BIL) (Pub. Law 117-58, Nov. 15, 2021).

2.2 GENERAL

- A. Manholes to be coated may be of brick, block, precast, or poured concrete construction. Some may have a previously applied interior mortar coating.
- B. Contractor shall keep complete and accurate field records for each manhole rehabilitated or where rehabilitation work has occurred. Show identifying manhole number, location, and quantities of rehabilitation materials used or rehabilitation methods, per the Bid Form, utilized.
- C. Cleaning, surface preparation, lining application, and thicknesses shall be as specified herein and shall meet or exceed the lining manufacturer's recommendations. When the manufacturer's minimum recommendations exceed the specified requirements, Contractor shall comply with the Manufacturer's minimum recommendations.

2.3 GROUTING MATERIAL (FOR VERY ACTIVE INFILTRATION AND FILLING VOIDS)

- A. Grouting material used for stopping very active infiltration and filling voids shall be volume stable and shall have a 28-day compressive strength of 250 psi. Chemical grouts may also be used for stopping very active infiltration and shall be mixed and applied per the manufacturer's recommendations.
- B. Grout that has not been used within 30 minutes after water has been added shall not be used.
- C. Water used shall be clean and potable.
- D. Grouting material shall be mixed and applied in accordance with the manufacturer's recommendations.
- E. Grouting material shall be compatible with the cementitious lining material.
- F. Grout shall be Strong Seal 250 as manufactured by The Strong Company, Quadex, Avanti, or approved equal.

2.4 PATCHING MATERIAL (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching material shall be a rapid setting, fiber reinforced, high early strength, corrosion resistant, hand mixed and hand applied, calcium aluminate based cementitious material.

- B. Patching material shall have the following minimum requirements:
 1. Compressive Strength (ASTM 109) – 800 psi at 1 hour and 1800 psi at 24 hours.
 2. Bond (ASTM C882) – 1600 psi at 28 days.
 3. Calcium Aluminate Cement – Sulfate resistant
 4. Applied Density – 105 pcf +/- 5 lbs pcf.
 5. Shrinkage (ASTM C596) 0% at 90% R.H.
 6. Placement Time – 5 to 10 minutes
 7. Set Time – 15 to 30 minutes
- C. Water used shall be clean and potable.
- D. Patching material shall be mixed and applied in accordance with the manufacturer's recommendations.
- E. The patching material shall be compatible with the cementitious lining material.
- F. Patching material shall be Strong Seal QSR as manufactured by The Strong Company, Quadex Hyperform as manufactured by Quadex, Inc., or approved equal.

2.5 INFILTRATION CONTROL MATERIAL (FOR MINOR INFILTRATION)

- A. Infiltration control material used to stop minor water shall be rapid setting, high early strength, hand applied, cementitious material specifically formulated for leak control.
- B. Infiltration control material shall have the following minimum requirements.
 1. Compressive Strength (ASTM 109) – 1000 psi at 1 hour and 2500 psi at 24 hours.
 2. Freeze/Thaw (ASTM C666 Method A) – 100 cycles.
 3. Sulfate Resistance (ASTMC267) – No weight loss after 15 cycles at 2000 ppm.
 4. Pull Out Strength (ASTM C234) – 14000 lbs
 5. Set Time – less than 1 minute
- C. Water shall be clean and potable.
- D. Infiltration control material shall be mixed and applied in accordance with the manufacturer's recommendations
- E. Infiltration control material shall be compatible with the cementitious lining material.
- F. Infiltration control material shall be Strong Seal Strong Plug as manufactured by The Strong Company, Quadex Quad Plug as manufactured by Quadex, Inc., or approved equal

2.6 CEMENTITIOUS LINER MATERIAL

- A. Liner material shall be a single component, acid resistant, fiber reinforced, spray applied, cementitious calcium aluminate mortar.
- B. Material shall be factory blended requiring only the addition of clean, potable water at the jobsite.
- C. Material shall be mixed, used, and applied in accordance with the manufacturer's recommendations.
- D. Liner material shall meet the following minimum requirements:

1. Compressive Strength (ASTM C109):	9,000 psi at 28 days
2. Tensile Strength (ASTM C496):	800 psi at 28 days

3.	Flexural Strength (ASTM C293):	1,500 psi at 28 days
4.	Shrinkage at 90% Relative Humidity (ASTM C596):	0% at 28 days
5.	Bond (ASTM C882):	2,000 psi at 28 days
6.	Freeze/Thaw (ASTM C666):	300 cycles, No Visible Damage

- E. Liner material shall be reinforced with alkaline resistant fiberglass rods not less than ½" in length.
- F. All material shall meet or exceed industry standards and shall not have any basic ingredient that exceeds EPA maximum allowable limit for any heavy metal.
- G. All cement liner materials must be capable of a placement thickness of ½" to 4" in a one pass monolithic application.
- H. Cementitious manhole liner shall be Strong-Seal® MS-2C® as manufactured by The Strong Company, AluminaLiner™ as manufactured by Quadex, or approved equal.

2.7 STANDARD MANHOLE RING AND COVER FOR 4 FT DIAMETER MANHOLES

- A. All manhole ring and covers for 4 ft. diameter manholes shall be heavy duty cast iron and non-perforated.
- B. Cover shall have the letters SANITARY SEWER permanently cast on the surface of the cover.
- C. Two closed pick holes with bars shall be cast into the cover for lifting.
- D. Ring and cover shall have a 23.5-inch diameter cover, 32-inch flange diameter, and a 22-inch diameter clear opening. Seat depth shall be 2-inches.
- E. Cover shall have a machined bearing surface to prevent rocking.
- F. Ring and cover shall be made in USA.
- G. Ring and cover shall be Model V1348-1 by East Jordan Iron Works, Inc., Model 1266 by Deeter Foundry, or approved equal.

2.8 MANHOLE RISER RINGS

- A. Manhole riser rings shall be compatible with the size and type of manhole cover with which it will be used.
- B. The throat section height shall not exceed 12-inches unless approved by Engineer. The throat section shall be defined as the distance from the bottom of the integral cast manhole ring to the top of the manhole cover.
- C. Manhole riser rings may be constructed of concrete, polyethylene, or approved equal.
- D. Manhole riser rings shall only be used with approval of Engineer.

2.9 TOOLS AND EQUIPMENT

- A. Contractor shall use equipment approved, designed, and manufactured by the material supplier if specifically designed for the application of cementitious coating materials.

2.10 MIXING AND HANDLING

- A. Mixing and handling of interior coating shall be in accordance with the recommendations of the manufacturer and in such a manner as to minimize hazard to personnel. It is the responsibility of the Contractor to provide appropriate protective measures to ensure that materials are secure at all times and are not available to unauthorized personnel or animals. Only personnel thoroughly familiar with the handling of the coating material shall perform the coating operations.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall be trained and approved by the liner manufacturer. The Contractor shall furnish all labor, supervision, equipment, materials, and testing for applying a cementitious mix to form a structural monolithic liner of a minimum of 1/2-inch thickness with machinery specially designed for the application. All aspects of the installation shall be in accordance with the manufacturer's recommendations and per these specifications. The coating shall be applied by a trained certified applicator.
- B. Manhole coating shall not be performed until replacement, adjusting, sealing of manhole ring and cover, manhole adjustments, partial manhole replacement, repair and grouting of manhole benches, troughs, walls, and corbels, and/or sewer line rehabilitation are complete.
- C. Coating material shall be mixed and applied in accordance with manufacturer's recommendations.
- D. The Contractor shall maintain flow entering the manhole by blocking, diverting, or bypass pumping if the flow will affect proper application/installation, as specified in specification Section 010000 "Basic Requirements". Blocking or diverting of active inflow, with pumping around as required, shall be incidental to the work defined in this specification.
- E. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction. The Contractor shall remove and dispose of all debris collected from the cleaning operation.
- F. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- G. The Contractor shall conduct operations in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, and to adjacent property owners or tenants.
- H. Any private property element or structure that is removed for access to the manhole shall be replaced by the Contractor to existing or better condition, to the satisfaction of the property owner and the Engineer, and in accordance with the Contract Documents.

3.2 REMOVAL OF STEPS

- A. Contractor shall remove all manhole steps in manholes that are lined with cementitious liner (Group 8 and 5). Contractor shall remove all steps in lower 18" of manholes for manholes in Group 3. Removal of steps shall be included in the bid item price for Group 8, 5, and 3.

- B. Contractor shall patch the area the steps are removed with material described in Part 2 of these specifications.

3.3 NOTICES TO PROPERTY OWNERS

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "Basic Requirements" and as required by the Owner and Engineer. Any access or easement related issues shall be immediately reported to the Engineer. The Contractor is not required to obtain or modify any easement.
- B. Refer to Section 010000 Basic Requirements for required Public Notices.
- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.

3.4 ACCESS TO MANHOLES

- A. The Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, with work notification, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.

3.5 WEATHER

- A. Install materials in accordance with weather conditions required by the manufacturer. Normal grouting operations including application of interior coating shall be performed at temperatures of 40 degrees Fahrenheit or greater, or in accordance with manufacturer's recommendations. No application shall be made if the temperature is anticipated to fall below 32 degrees Fahrenheit within 24 hours.
- B. No application shall be made on frozen surfaces.
- C. Precautions shall be taken to keep mix temperatures at time of application below 90 degrees Fahrenheit. Water temperature shall not exceed 80 degrees Fahrenheit. Chill with ice if necessary.

3.6 MANHOLE CASTING (REMOVE, REPLACE, RAISE TO GRADE) (Group 1 and 2)

- A. Removal, replacement and raising manhole ring and covers shall be performed on those manholes identified in the Manhole Rehabilitation Summary Sheets in the Appendix as Group 1 or 2.
- B. The Contractor shall furnish all labor, equipment, and materials to remove the existing manhole ring and cover and replace with a new manhole ring and cover.
- C. Contractor shall properly dispose of all salvaged ring and covers.
- D. Construction Methods:
 - 1. Materials shall be removed from around the frame to a depth to expose the entire frame and cover.
 - 2. If the manhole is located in pavement, the frame and cover removal shall be accomplished by sawcutting a 4 ft. x 4 ft. square in the pavement.

3. Rebuild and adjust, if necessary, the top of the manhole to required elevation.
4. Set the new manhole frame in full mortar bed with a mastic seal between mortar and manhole frame. Grout the perimeter of the new casting to the existing cone or chimney section.
5. In paved areas such as roads, driveways, sidewalks, etc. set the ring and cover flush with the pavement.
6. When raising manhole ring and cover to grade in non-paved areas, set the ring and cover one-tenth (0.10) of a foot above existing natural grade.
7. Backfill under pavement, drives, and sidewalks shall be compacted to 95% of maximum density modified proctor.
8. Backfill in non-paved areas shall be compacted to 90% of maximum density modified proctor.
9. If the manhole is in a paved area, replacement of asphalt and concrete shall be in accordance with Sections 320117 and 320129 of these specifications.

3.7 GROUT AND LINE LOWER 18" OF MANHOLE (Group 3)

- A. Grouting and lining the lower 18" of manholes shall be performed on those manholes identified in the Manhole Rehabilitation Summary Sheets in the Appendix as Group 3.
- B. Preparation of the lower 18" shall be in accordance with Part 3.10 of these specifications.
- C. Liner shall be in accordance with Part 3.14 of these specifications.

3.8 REPAIR CONSTRUCT MANHOLE BENCH AND INVERT (Group 6)

- A. Invert and bench repair shall be performed on those manholes identified in the Manhole Rehabilitation Summary Sheets in the Appendix as Group 6.
- B. Preparation shall be in accordance with Part 3.10 of these specifications.
- C. After blocking flow through the manhole and thoroughly cleaning invert and bench, apply patching material described in Part 2 of these specifications to the invert and bench in an expeditious manner. The material shall be troweled uniformly onto the damaged invert at a minimum thickness of ½-inch at the invert extending out onto the bench on the manhole sufficiently to tie into the structural monolithic liner to be spray applied. The finished invert and bench surfaces shall be smooth and free of ridges.
- D. Spray the bench with liner materials in a manner such that a gradual slope is produced from the walls to the invert with the thickness at the invert to be no less than ½-inch. The wall/bench intersection shall be rounded to a uniform radius the full circumference of the intersection.

3.9 CHIMNEY SEALS

- A. Chimney seals shall be installed on those manholes identified in the Manhole Rehabilitation Summary Sheets in the Appendix as Group 4. Refer to Section 333930 of these Specifications.
- B. Chimney seals shall be installed in accordance with the manufacturer's recommendations.

3.10 APPLICATION PREPARATION (Group 8, 5, and 3)

- A. Prepare the manhole as per the manufacture's recommendations and as herein specified.

- B. Place covers over invert to prevent extraneous material from entering the sanitary sewer lines before cleaning. Any construction related material that enters the sewer mains shall be removed by the Contractor, at no additional cost to the Owner.
- C. All foreign material including but not limited to dirt, grease, sludge, and debris shall be removed from the manhole wall, corbel, and bench using a high-pressure water spray (minimum of 3500 psi). If grease, chemicals, previous coatings or other surface contaminants are present, the surface shall be cleaned with steam, chemical cleaning compounds, or surface abrading as necessary to provide a clean substrate contact material. Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper.
- D. Remove all materials that are in the joint area. Clean out the joint completely if possible. Joint cleaning can be done by the same methods listed herein.
- E. Remove all loose or defective brick, grout, steps, protruding ledges, or other loose debris from the patching area. Fill any large voids with quick setting patching mix as specified herein. All materials resulting from the cleaning of the structure shall be removed from the manhole prior to the application of the coating.
- F. Active leaks in walls, bench, cone, chimney, etc. shall be stopped using quick setting, specially formulated infiltration control mixes as described in Part 2 of these specifications and according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application. After application, the weep holes shall be plugged with infiltration control material as described in Part 2 of these specifications. When severe infiltration exists, drilling may be required in order to pressure grout using a grouting material as specified in Part 2.2 of these specifications. Manufacturer's recommendations shall be followed when pressure grouting is required.
- G. Where overspray or droppings may affect the benching or flow channels, the manhole base shall be covered with plywood and braced to provide a firm working platform.
- H. Contractor shall remove all manhole steps in manholes that are lined with cementitious liner (Group 8 & 5). Contractor shall remove all steps in lower 18" of manholes for manholes in Group 3. Removal of steps shall be included in the bid item price for Group 3, 5, and 8. Contractor shall patch the area the steps are removed with material described in Part 2 of these specifications.

3.11 REPAIR AND GROUT PIPE SEALS (as a Part of Group 3, 5, and 8)

- A. Contractor shall repair and grout pipe seals for all manholes identified in the Manhole Rehabilitation Summary Sheets in the Appendix as Group 8, 5, and 3. All infiltration around the pipe seals shall be stopped.
- B. No separate payment will be made for repair and grouting of pipe seals for manholes identified in Group 8 or 5.

3.12 BENCH APPLICATION OF LINER MATERIALS (as a part of Group 8 and 5)

- A. After the walls are coated, the invert/bench covers shall be removed and the bench sprayed with coating material in such a manner as to have a gradual slope from the walls to the invert with the thickness at the invert to be no less than 1/2-inch. The wall/bench intersection built up and rounded to a uniform radius for the full circumference of the intersection. Trough area shall be coated as required to seal all cracks and to provide a smooth surface. The Contractor shall prepare a watertight seal and smooth transition between pipe penetrations

(either lined pipe or unlined pipe) and manhole coating system. No leakage or gaps will be allowed.

- B. Manholes identified as Group 8 and 5 in the Manhole Rehabilitation Summary Sheets in the Appendix shall have the bench coated with liner materials as a part of that bid item. No separate payment shall be made for lining the bench for manholes identified in Group 8, 5, and/or 3.

3.13 MIXING OF LINER MATERIALS (Group 8, 5, and 3)

- A. For each bag of product, use the amount of water required per manufacturer's recommendations following mixing procedures noted on product bag. Use only enough water to produce a mix consistency to allow application of liner material 1 inch thick in a single application without material sagging on vertical surface.
- B. Prepared mix shall be discharged into a hopper and another batch prepared to occur in such a manner as to allow spraying continuously without interruption until each application is complete.

3.14 SPRAYING OF LINER MATERIALS (Group 8, 5, and 3)

- A. Surface shall be clean and free of all foreign material and shall be damp without noticeable free water droplets or running water, but totally saturated just prior to application of material. Materials shall be spray applied up to 1 inch thick in one or more passes from the bottom of the frame; however, minimum total thickness shall not be less than ½-inch. The surface shall then be troweled to a relatively smooth finish being careful not to over trowel.
- B. A brush finish shall be applied to the trowel finished surface. Manufacturer's recommendations shall be followed whenever more than 24 hours have elapsed between applications.

3.15 CURING

- A. Cure materials in accordance with the manufacturer's recommendations.

3.16 TESTING OF REHABILITATED MANHOLES

- A. Visual inspection of the finished product shall verify a leak free, uniform appearance. The cementitious coating shall provide a continuous surface with uniform thickness throughout the manhole interior.
- B. All manholes rehabilitated with cementitious liner shall pass a vacuum test.
- C. Vacuum testing shall be performed after liner material has appropriately cured, as recommended by liner material manufacturer.
- D. Contractor shall provide all test equipment and perform the test under witness by the Engineer and authorities having jurisdiction.
- E. Manholes shall be tested using the vacuum testing procedure:
 - 1. Vacuum test head shall be positioned at the inside surface of the concrete at the top of the cone section and the seal inflated in accordance with the equipment manufacturer's instructions.
 - 2. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump isolated by

the shut-off valve on the test head connection.

3. When valve is closed, time measurement shall commence, and the time required for vacuum drop to 9-inches of mercury shall be observed and recorded.
4. The time measured for vacuum drop from 10-inches to 9-inches of mercury shall not be less than indicated in the following table:

Depth of Manhole (Feet)	Time in seconds for 1" Drop in Mercury		
	48" Diameter	60" Diameter	72" Diameter
<10'	20	26	33
10'	25	33	41
12'	30	39	49
14'	35	46	57
16'	40	57	67
18'	45	59	73
20'	50	65	81
22'	55	72	89
24'	59	78	97
26'	64	85	105
28'	69	91	113
30'	74	98	121

5. Manholes showing greater than the allowable leakage shall be repaired and re-tested until a satisfactory leakage result is obtained.
- F. All manholes with leaks in excess of the above shall be repaired or replaced. All corrective work shall be approved by the Engineer.
- G. Repair manholes failing the vacuum test and repeat testing until leakage is within allowances specified.

END OF SECTION

SECTION 333961

REHABILITATION OF SANITARY SEWER MANHOLES (1/2-inch of Cementitious Liner Followed by 125 mils of Epoxy)

PART 1 - GENERAL

1.1 SCOPE

- A. This section governs all work, materials, and testing required for the spray application of a cementitious mix followed by a 100% solids epoxy (or polyurethane) to form a structural monolithic liner for manholes. The Contractor shall be responsible for the furnishing of all labor, supervision, materials, and equipment required to complete all manhole rehabilitation work as specified herein.
- B. This section includes, but is not limited to, the following for rehabilitation of manholes by the application of ½-inch cementitious coating followed by 125 mils of 100% solids epoxy: flow control, cleaning and surface preparation for existing manhole to be sprayed, removal and disposal of any loose and unsound material, elimination of active infiltration prior to liner application, patching of voids and joints, sealing of pipes and inverts, structural rebuilding as required, spray application of a cementitious mix to form a structural monolithic liner, surface restoration, testing, and other related and incidental work as may be required to provide completely sealed, patched, and lined manholes acceptable to Owner and Engineer.
- C. Work described herein may be in conjunction with work described in other specification sections, as defined on the Bid Form and referenced herein.
- D. Paid separately under other sections: Removal and replacement of manhole ring and cover, adjustments of manholes ring and cover, repair and rehabilitation of bench, troughs, pipe seals, and bottom 18-vertical inches of manholes, repair and rehabilitation of manhole walls and corbels, installation of internal or external chimney seals, and other incidentals and requirements of this Contract for a complete and rehabilitated system.
- E. Refer to specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers" and/or the project drawings for manhole construction materials and methods not covered in this Section.
- F. Manholes designated for cementitious and epoxy manhole coating are shown on the Manhole Rehabilitation Schedule in Appendix A and/or are designated on the Drawings.
- G. Payment shall be made in full for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the work herein specified. Refer to specification Section 012200 "Measurement and Payment" for details regarding measurement of work for payment.

1.2 SUBMITTALS

- A. Submit in accordance with Section 013000 - Submittals.
- B. Submit documentation of previous manhole rehabilitation work. Submit a list of a minimum of three (3) recently completed manhole rehabilitation projects including project name and location, names of owner and engineer, description of products used, and application procedures.

- C. Submit written and dated certification stating Contractor is factory trained and approved by the manufacturer for application of the specified products.
- D. Submit a list of key supervisory personnel that will be working on the project. Provide a resume for each of the key supervisory personnel that includes their experience with the proposed products, including specific projects and their responsibilities, and their history with the Contractor submitting the bid. Key supervisory personnel shall have a minimum of 3 years of experience installing the proposed product. Key supervisory personnel shall be on-site when work is being performed on the project. The Engineer shall be notified in writing when there is any change in key supervisory personnel.

1.3 MANUFACTURERS RECOMMENDATIONS

- A. Materials, mixture ratios, and procedures utilized for the coating process shall be in accordance with manufacturers' recommendations.

1.4 REFERENCES

- A. ASTM and other applicable standards, that are listed in these specifications or on the drawings, are made a part of these specifications by reference to the extent stated herein and shall be the latest edition thereof.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Manholes to be coated may be of brick, block, precast, or poured concrete construction. Some may have a previously applied interior mortar coating.
- B. Contractor shall keep complete and accurate field records for each manhole rehabilitated or where rehabilitation work has occurred. Show identifying manhole number, location, and quantities of rehabilitation materials used or rehabilitation methods, per the Bid Form, utilized.
- C. Cleaning, surface preparation, lining application, and thicknesses shall be as specified herein and shall meet or exceed the lining manufacturer's recommendations. When the manufacturer's minimum recommendations exceed the specified requirements, Contractor shall comply with the Manufacturer's minimum recommendations.
- D. Coordinate surface preparation of substrates to avoid later difficulty or delay in performing the Work of this Section.
- E. Review installation procedures under other Sections and coordinate the installation of items that must be installed prior to application of the protective lining.
- F. Performance Criteria: The surfaces to receive the protective lining shall be capable of withstanding under constant exposure to raw wastewater, permeation from hydrogen sulfide and other sewer gases, and attack from organic acids generated by microbial sources with no adverse effects. Products must have sufficient field history and accelerated laboratory testing to substantiate product viability for these exposures.

2.2 BUILD AMERICA, BUY AMERICA

- A. All materials shall comply with the requirements, terms and conditions of Build America, Buy America Act (BABA) (23 U.S.C. 313, 23 CFR 635.410) under the Infrastructure

2.3 GROUTING MATERIAL (FOR VERY ACTIVE INFILTRATION AND FILLING VOIDS)

- A. Grouting material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Grouting material shall be used for filling voids (in porous soils) behind substrates for leak and subsidence control, and for stopping very active infiltration. Apply required products to restore structural integrity of substrate prior to using any pressure-injection grouting.

2.4 PATCHING MATERIAL (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Patching material shall be used for patching, filling, and repairing holes, cracks, voids, and spalls in concrete and masonry, grouting around pipes, and grouting interior joints of manholes. Patching material shall be used to fill voids to prevent pressure-injected grouts from escaping areas of application.

2.5 INFILTRATION CONTROL MATERIAL (FOR MINOR INFILTRATION)

- A. Infiltration control material shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".
- B. Infiltration control grout shall be used to stop minor water infiltration and shall be specially formulated for leak control. The product shall be designed to stop flowing leaks in vertical and horizontal concrete and masonry surfaces.

2.6 CHEMICAL GROUT

- A. Chemical grout material shall be in accordance with specification Section 333950 "Rehabilitation of Manhole Walls and Corbel".
- B. Chemical grout shall be approved by the Engineer and shall only be eligible for use if other methods of infiltration and leak control fail to perform. The Contractor shall submit the required information for the type of chemical grout that is proposed for use on this project. Depending on the specific application, either Acrylic or Acrylate Based Grout, or Urethane Based Grout, shall be furnished. The type of grout to be used shall be in accordance with the manufacturer's recommendation for the specific application on the project.

2.7 NON-SHRINK REPAIR MORTAR (NON-HYDRAULIC)

- A. Non-shrink repair mortar shall be in accordance with specification Section 333913 "Sanitary Sewer Manholes, Frames, and Covers".

2.8 ROOT INHIBITOR

- A. Root inhibiting products shall be in accordance with specification Section 333950 "Manhole Grouting". Deviations from these specifications shall be noted clearly on the submittal for Root Inhibitor products.

- B. All present root growth will be removed from area designated for repairs, rehabilitation, or lining, prior to allocation of grout or patching materials. Special attention should be used during the cleaning operation to remove roots from the joints. Chemical root treatment shall be used before or following the root removal operation, depending on the manufacturer's recommendation. The Contractor shall capture and remove all roots from manholes.
- C. The application of the root inhibitor to the roots shall be done in accordance with the manufacturer's recommendations and specifications in such a manner to preclude damage to surrounding vegetation. Any damaged vegetation, so designated by the Engineer or Owner, shall be replaced by the Contractor at no additional cost to the Owner. All safety precautions as recommended by the manufacturer shall be adhered to for handling and application of any root inhibitor.

2.9 ADDITIVES

- A. Grout additions may be utilized for catalyzing the gel reaction, inhibiting the gel reaction, buffering the solution, lowering the freezing temperature of the solution, acting as filler, providing strength or for inhibition of root growth.

2.10 CEMENTITIOUS LINER MATERIAL

- A. Liner material shall be a single component, acid resistant, fiber reinforced, spray applied, cementitious calcium aluminate mortar.
- B. Material shall be factory blended requiring only the addition of clean, potable water at the jobsite.
- C. Material shall be mixed, used, and applied in accordance with the manufacturer's recommendations.
- D. Liner material shall meet the following minimum requirements:

1. Compressive Strength (ASTM C109):	9,000 psi at 28 days
2. Tensile Strength (ASTM C496):	800 psi at 28 days
3. Flexural Strength (ASTM C293):	1,500 psi at 28 days
4. Shrinkage at 90% Relative Humidity (ASTM C596):	0% at 28 days
5. Bond (ASTM C882):	2,000 psi at 28 days
6. Freeze/Thaw (ASTM C666):	300 cycles, No Visible Damage
7. Applied Density:	No less than 125 pcf
- E. Liner material shall be reinforced with alkaline resistant fiberglass rods not less than ½" in length.
- F. All material shall meet or exceed industry standards and shall not have any basic ingredient that exceeds EPA maximum allowable limit for any heavy metal.
- G. The manufacturer shall provide a source for consultation throughout the application of the manhole liner system.
- H. All cement liner materials must be capable of a placement thickness of ½" to 4" in a one pass monolithic application.
- I. Cementitious manhole liner shall be Strong-Seal® MS-2C® as manufactured by The Strong Company, AluminaLiner™ as manufactured by Quadex, or approved equal.

2.11 EPOXY PROTECTIVE LINER MATERIAL

- A. Material shall be mixed, used and applied in accordance with the manufacturer's recommendations.
- B. Epoxy liner shall be applied after installation of cementitious liner.
- C. The epoxy protective liner material shall be compatible with the cementitious liner material.
- D. Epoxy liner shall be 100% solids, No VOC.
- E. Epoxy liner material shall meet the following minimum requirements:
 - 1. Compressive Strength (ASTM D695) - 8,800 psi
 - 2. Tensile Strength (ASTM D638) - 5,600 psi
 - 3. Flexural Strength (ASTM D790) - 12,400 psi
 - 4. Pull off Strength (ASTM D4541) - 350 psi
 - 5. VOC (ASTM D2584) - 0%
 - 6. Durometer Hardness Type D (ASTM D2240) - Shore D-70.
 - 7. Moisture Absorption (ASTM C413) - 0.03%
- F. Epoxy liner material shall be Strong Seal Epoxy as manufactured by The Strong Company, Quadex Structure Guard as manufactured by Quadex, Inc., Warren Environmental Epoxy S301-14 as manufactured by Warren Environmental Epoxy Inc.; or approved equal.
- G. Approved alternative protective coating products (to be used in lieu of Epoxy) shall be as shown in these Specifications.

2.12 ALTERNATIVE PROTECTIVE LINER MATERIALS (IN LIEU OF EPOXY)

- A. Approved alternative protective coating products (to be used in lieu of Epoxy as specified) are as follows. **All alternative protective coating products shall be applied after the cementitious liner material.**
 - 1. Polyurethane System - SprayWall lining material as manufactured by SprayRoq, Inc.
 - a. **SprayWall lining material shall be applied after installation of cementitious liner.**
 - b. SprayWall lining material shall be mixed, used and applied in accordance with the manufacturer's recommendations and as herein specified.
 - c. SprayWall protective liner material shall be a spray applied, ultra high build, self priming polyurethane resin system.
 - d. SprayWall lining material shall be 100% solids and VOC free.
 - e. SprayWall lining material shall be a two component (A and B) resin system that uses a heated plural component spray system. After the components are mixed, the SprayWall lining material shall gel in approximately 10 seconds with a tack-free condition after one minute.
 - f. In its final state, the SprayWall protective lining material shall be rigid and capable of being applied at any thickness in a single mobilization.
 - g. The physical properties of the Spray Wall protective lining material shall meet the following minimum requirements:
 - 1. Flexural Modulus (long term) - 730,000 psi.
 - 2. Flexural Strength - 14,000 psi
 - 3. Compressive Strength - 19,000 psi
 - 4. Tensile Strength - 7,400 psi
 - 5. Tensile Modulus - 420,000 psi
 - 6. Elongation - 4% at Break

7. Manning's "N" Factor - 0.009
 8. Hardness, Shore D - 90
 9. Adhesion to Concrete - substrate failure.
 - h. The cementitious liner material shall be compatible with the SprayWall protective lining material. Contractor shall be responsible for providing a certification that the cementitious liner and SprayWall protective lining materials are compatible.
 - i. All other items (surface preparation, acceptance testing, removal of steps, invert and bench repair, weather, equipment, mixing, etc) shall be in accordance with other parts of these specifications.
 - j. Minimum thickness of polyurethane liner (not including cementitious liner) shall be 125 mils.
2. Polyurethane System - Zebron primer and lining material as manufactured by Zebron Corporation of Anaheim, California.
- a. **Zebron primer and lining material shall be applied after installation of cementitious liner.**
 - b. Zebron primer and lining material shall be mixed, used and applied in accordance with the manufacturer's recommendations and as herein specified.
 - c. Zebron primer shall be a 1-3mil thickness of a 100% solids nonsolvented, moisture tolerant, low temperature cure, epoxy primer. The primer material shall be 100% solids, moisture tolerant epoxy capable of spray application to 1-3 mils thickness in one continuous coat.
 - d. Zebron lining material shall be a plural component, 3-1 mix ratio, 100% solids, nonsolvent hybrid polyurethane coating with a shore "D" hardness of 57 at 77 degrees Fahrenheit. Zebron lining material shall be Zebron #386 as manufactured by the Zebron Corporation of Anaheim, California. Lining material shall be the high build type capable of application thickness, as specified, without runs or sags and shall be capable of passing ASTM D1737 for flexibility using cylinder mandrel of 0.5 inch (12.7 millimeter). The flash point of the fluid mixture shall be 450 degrees Fahrenheit open Zahn cup.
 - e. The lining material shall have evidence of passing the "pickle jar test" as is noted in section 207-15.3 Chemical Resistance, in the "Greenbook" Standard Specifications for Public Works Construction 2006 Edition. The material shall also meet the requirements in 500-2.4, and the table 500-2.4.10(A), in the "Greenbook" Standard Specifications for Public Works Construction, 2006 edition. The color shall be white or cream. The complete coating shall be impermeable to sewer gases and liquids and nonconductive to bacterial or fungus growth. The lining shall be capable of repair at any time during its life.
 - f. The physical properties of the Zebron protective lining material shall meet the following minimum requirements:
 1. Flexibility - No effect bending 0.5mm plate (ASTM D-792)
 2. Compressive Strength - 4,200 psi (ASTM G695)
 3. Tensile Strength - 2,500 psi at 25 degrees C (ASTM D-638)
 4. Elongation - Recoverable:67% at 25 degrees C (ASTM D-638)
 5. Hardness, Shore D - 60 to 70
 6. Bond Strength - 1500 psi on steel
 7. Impact - 1637 in/lb (ASTM G-14 on steel pipe)
 8. Impact - No failures (ASTM D-792)
 9. Abrasion Resistance - 250,000 units (ASTM D658)
 - g. The lining material shall meet the following resistive specifications:
 1. Acetic Acid - 5% concentration
 2. Sulfuric Acid - 20% concentration
 3. Sodium Hydroxide - 5% concentration
 4. Ammonium Hydroxide - 5% concentration
 5. Nitric Acid - 1% concentration
 6. Ferric Acid - 1% concentration
 7. Soap - 0.1% concentration

- 8. Detergent (Linear Alkyl Benzyl Sulfonate or LAS) - 0.1% concentration
- 9. Bacteriological - BOD not less than 700 ppm
- h. The cementitious liner material shall be compatible with the Zebulon protective lining material. Contractor shall be responsible for providing a certification that the cementitious liner and Zebulon protective lining materials are compatible.
- i. All other items (surface preparation, acceptance testing, removal of steps, invert and bench repair, weather, equipment, mixing, etc) shall be in accordance with other parts of these specifications.
- j. Minimum thickness of polyurethane liner (not including cementitious liner) shall be 125 mils.

2.13 TOOLS AND EQUIPMENT

- A. Contractor shall use equipment approved, designed, and manufactured by the material supplier specifically designed for the application of cementitious and epoxy coating materials.

2.14 MATERIAL IDENTIFICATION

- A. Contractor shall completely identify the types of grout, mortar, patching compounds, sealant, and/or root control chemicals used and provide case histories of successful use or defend the choice of grouting materials based on chemical and physical properties, ease of application, and expected performance, to the satisfaction of the Owner's Representative.

2.15 MIXING AND HANDLING

- A. Mixing and handling of interior coating, which may be toxic under certain conditions shall be in accordance with the recommendations of the manufacturer and in such a manner as to minimize hazard to personnel. It is the responsibility of the Contractor to provide appropriate protective measures to ensure that materials are under control at all times and are not available to unauthorized personnel or animals. All equipment shall be subject to the approval of the Owner's Representative. Only personnel thoroughly familiar with the handling of the coating material shall perform the coating operations.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall be trained and approved by the liner manufacturer. The Contractor shall furnish all labor, supervision, equipment, materials, and testing for applying a cementitious mix to form a structural monolithic liner of a minimum of 1/2-inch thickness followed by 125 mil epoxy with machinery specially designed for the application. All aspects of the installation shall be in accordance with the manufacturer's recommendations and per these specifications. The coating shall be applied by a trained certified applicator. The applicator shall furnish all of the labor, equipment, materials and application as required by the manufacturer. The applicator shall comply with all local; state and OSHA confined space entry requirements.
- B. Manhole coating shall not be performed until replacement, adjusting, sealing of manhole ring and cover, manhole adjustments, partial manhole replacement, repair and grouting of manhole benches, troughs, walls, and corbels, and/or sewer line rehabilitation are complete. Repair and rehabilitation specification for other manhole areas are included in other sections of these Contract Documents.

- C. New pipe shall protrude a minimum of two-inches beyond the interior of pipe entry for invert repairs required in conjunction with new pipe.
- D. Measure the cement and epoxy liner depth to ensure that the desired thickness has been applied. Finish surface as recommended by manufacturer. Spray apply in such a manner so as to produce an even surface.
- E. Contact manufacturer for recommendations if more than 24 hours have passed between starting and finishing the application.
- F. Coating material shall be mixed and applied in accordance with manufacturer's recommendations.
- G. Manhole coating shall be coordinated with other work required at manhole which may affect any other repairs to be performed.
- H. The Contractor shall maintain flow entering the manhole by blocking, diverting, or bypass pumping if the flow will affect proper application/installation, as specified in specification Section 010000 "Basic Requirements". Blocking or diverting of active inflow, with pumping around as required, shall be incidental to the work defined in this specification.
- I. Contractor shall conform to specification Section 010000 "Basic Requirements", in which is defined applicable general requirements for the project, including pre-construction activities, utility related requirements, environmental related requirements, construction responsibilities, administrative requirements, and post-construction procedures.
- J. The Contractor shall keep the interior of the manholes free from dirt, rocks, and other debris during construction. The Contractor shall remove and dispose of all debris collected from the cleaning operation.
- K. Clean-up shall be a continuous operation. If the Engineer determines clean-up activities are not proceeding in a timely manner, the Contractor shall suspend other work and devote his entire effort to clean-up until the Engineer determines that clean-up work has been caught up.
- L. The Contractor shall conduct operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, and to adjacent property owners or tenants.
- M. Contractor shall comply with all relevant provisions of Safety and Health Regulations for Construction. Specific attention is directed to OSHA safety rules, regulations, and precautions to be taken by the Contractor before entering sanitary sewer manholes with respect to physical and chemical hazards which may be present. Contractor shall ventilate interior and exterior application areas, and all occupied spaces adjacent to application areas, during the application of products specified herein, such as grout.
- N. Install materials in accordance with safety and weather conditions required by the manufacturer and/or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Normal grouting operations including application of interior coating shall be performed at temperatures of 40 degrees Fahrenheit or greater, or in accordance with manufacturer's recommendations. No application shall be made if the temperature is anticipated to fall below 32 degrees Fahrenheit within 24 hours. No application shall be made on frozen surfaces. Precautions shall be taken to keep mix temperatures at time of application below 90 degrees Fahrenheit. Water temperature shall not exceed 80 degrees Fahrenheit. Chill with ice if necessary.

- O. Any private property element or structure that is removed for access to the manhole shall be replaced by the Contractor to existing or better condition, to the satisfaction of the property owner and the Engineer, and in accordance with the Contract Documents.
- P. Contractor shall remove all manhole steps, at manholes identified in the Manhole Rehabilitation Schedule provided in Appendix A and as shown on the Drawings, and as specified in Section 333950 "Rehabilitation of Manhole Walls and Corbel".
- Q. Seal all unsealed lifting holes, unsealed step holes, precast manhole section joints or cold joints, and voids with material specified in Part 2 and as specified in Section 333950 "Rehabilitation of Manhole Walls and Corbel".
- R. Cleaning, surface preparation, lining application, and thicknesses shall be as specified herein and shall meet or exceed the lining manufacturer's recommendations. When the manufacturer's minimum recommendations exceed the specified requirements, Contractor shall comply with the Manufacturer's minimum recommendations.

3.2 ACCESS TO MANHOLES

- A. Contractor shall prepare and distribute notices necessary to perform the Work in accordance with specification Section 010000 "General Requirements" and as required by Malvern Water Works. Any access or easement related issues shall be immediately reported to the Engineer. The Contractor is not required to obtain or modify any easement.
- B. Refer to Section 010000 "Basic Requirements" for required Public Notices.
- C. Contractor shall immediately notify the Engineer and any home or business that will not be reconnected within the timeframe provided in the delivered written notice.
- D. Malvern Water Works owns easements for most of the facilities located on private property. The Contractor is responsible for determining the location and suitability of access points to manholes included in this rehabilitation project, and shall identify such access points to property owner, with work notification, if crossing private property is required for access. Storage of materials and equipment shall not be allowed on private property unless the Contractor obtains written permission from the property owner. Contractor shall notify Engineer of intent to contact private property owner, for the purpose of obtaining written permission to use the property for storage, prior to contact with the property owner.
- E. The Work included in this Project may require related activities in close proximity to existing buried and aerial utility lines and facilities, such as water lines, sewer lines, storm drains, natural gas lines, electrical power lines, telephone cables, and TV cables. The locations of all such utilities and individual service lines are not known. The Contractor shall be aware of the potential for such utility lines to conflict with intended construction efforts. The Contractor shall use appropriate precautionary measures to locate and protect such utility lines and services so as to avoid damage and interruptions to service, as required by the rehabilitation work at manholes.
- F. The Contractor shall contact the owners of the various existing utility lines and services as may be affected by the construction and solicit their assistance in identifying, locating, marking, and protecting these facilities prior to the beginning of any excavation or other work which might endanger the existing utilities. If such utilities are damaged or impaired because of the Contractor's actions or omissions, the Contractor shall be responsible for the cost of repairs or replacements of the affected or damaged utility or service line.

- G. The Contractor shall comply with the Arkansas One-Call System and shall alert potentially conflicting utility systems accordingly.

3.3 MATERIALS AND METHODS OF REPAIRS

- A. Manholes to be repaired may be of brick, pre-cast, or poured concrete construction.
- B. Filling of large voids, cracks, holes, lifting holes, step holes, joints, and other non-infiltrating penetrations in the manhole wall and corbel, shall be completed by the hand application of quick setting patching material as defined herein. Patching materials and repairs shall not commence until infiltration or any leaks are properly sealed and manhole area re-cleaned.
- C. Minor, active leaks in walls and corbels shall be stopped using quick-setting, high-early-strength, hand applied specially formulated infiltration control mixes, as defined herein. Some leaks may require weep holes to localize the infiltration during the application of the infiltration control mix. When severe infiltration exists, and the infiltration control mix is not sufficient to stop the leak, only then shall drilling be allowed for pressure grouting (chemical injection), as defined herein. No additional payment shall be made for the use of pressure grouting (chemical injection) methods over hand applied infiltration control mixes. Rehabilitation of manhole walls and corbel shall be paid as defined on the Bid Form and in the Measurement and Payment specification of these Contract Documents.
- D. Diverting and/or blocking of active inflow shall be incidental to the work defined in this specification.

3.4 PATCHING GROUT (FOR FILLING VOIDS AND PIPE PENETRATIONS)

- A. Patching grout shall be hand or trowel placed, applying pressure and holding in position until material remains in place.
- B. This grout shall be used for filling large voids, cracks, and areas around incoming pipelines, and shall be used to fill voids to prevent applied pressure-injected grouts from escaping.
- C. Material shall be troweled uniformly onto damaged substrate at a minimum thickness of ½-inch. Patching material shall be used to repair damage at manhole walls, corbels, and other areas that are exhibiting infiltration.
- D. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.

3.5 INFILTRATION CONTROL GROUT (FOR MINOR INFILTRATION)

- A. Apply as a dry or very thick paste by hand or trowel. Hold material in place to allow the infiltrating liquid to set the mix. Some leaks may require weep holes to localize infiltration during the application. After application, weep holes shall be plugged with the patching material as described herein.
- B. This grout shall be used to stop minor water infiltration and shall be specially formulated for leak control.
- C. Mixing, handling, and application of grout shall be in accordance with the recommendations of the manufacturer. Water shall be clean, potable water.

3.6 CHEMICAL GROUT APPLICATION

- A. Chemical grout application shall be in accordance with specification Section 333950 "Rehabilitation of Manhole Walls and Corbel".

3.7 CEMENTITIOUS LINER APPLICATION

- A. Prepare the manhole as per the manufacture's recommendations and as herein specified.
- B. Place covers over invert to prevent extraneous material from entering the sanitary sewer lines before cleaning. Any construction related material that enters the sewer mains shall be removed by the Contractor, at no additional cost to the Owner.
- C. All foreign material including but not limited to dirt, grease, sludge, mineral deposits, and debris shall be removed from the manhole wall, corbel, and bench using a high-pressure water spray (minimum of 3500 psi). If grease, chemicals, previous coatings or other surface contaminants are present, the surface shall be cleaned with steam, chemical cleaning compounds, or surface abrading as necessary to provide a clean substrate contact material. Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper
- D. Remove any and all materials that are in the joint area. Clean out the joint completely if possible. Joint cleaning can be done by the same methods listed herein.
- E. Remove all loose or defective brick, grout, steps, protruding ledges, or other loose debris from the patching area. Fill any large voids with quick setting patching mix as specified herein. All materials resulting from the cleaning of the structure shall be removed from the manhole, and disposed of properly.
- F. The Contractor shall cut and trim all roots that may interfere with the adequate repair of the manhole walls and corbels, or areas as defined by this specification. A root inhibitor shall be utilized at all repair sites within the manhole, as defined herein.
- G. Ventilate interior and exterior application areas, and all occupied spaces adjacent to application areas, during the application of grout.
- H. Active leaks shall be stopped using quick setting, specially formulated infiltration control mixes as described herein and according to manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application. After application, the weep holes shall be plugged with patching material as described herein. When severe infiltration exists, drilling may be required in order to pressure grout using a grouting material as specified herein. Manufacturer's recommendations shall be followed when pressure grouting is required.
- I. After sealing of leaks, clean manhole areas again. All materials resulting from the cleaning of the structure shall be removed prior to application of patching materials. Loose material shall be removed from the area to be patched or re-pointed exposing a sound sub-base. Inspect the areas to be grouted or patched to assure that the surfaces are clean and wet.
- J. Repair and patch manhole corbels and walls, seal pipe seals, and rebuild inverts, troughs, and benches that have visible damage present. All holes and/or voids, joints or pipes, spalled areas, and cracks shall be patched with rapid-setting patching material, as specified herein. Application of patching materials shall be completed by hand application. Cracks not subject to movement and greater than 1/16 inch in width shall be

routed out to a minimum width and depth of ¾ inch and patched with non-shrink patching mortar or grout, as specified herein. All unsealed lifting holes, unsealed step holes, voids larger than approximately one-half (1/2) inch in thickness shall be filled with patching compound.

- K. The surface of the patching material is to be troweled to assure that material penetrates voids and sets the bond to the substrate. Finished surfaces not to be lined shall be smooth and free of ridges. Inverts shall be U-shaped and have a minimum depth of 1/2 pipe diameter. Benches shall have smooth surfaces without defects that allow debris to accumulate.
- L. Where overspray or droppings may affect the benching or flow channels, the manhole base shall be covered with plywood and braced to provide a firm working platform.
- M. For each bag of product, use the amount of water required per manufacture's recommendations following mixing procedures noted on product bag using only enough water to produce a mix consistency to allow application of coating material ½" minimum thick in a single application without material "sagging" on vertical surface and using the equipment for mixing and application in accordance with these specifications.
- N. Prepared mix shall be discharged into a hopper and another batch prepared to occur in such a manner as to allow spraying continuously without interruption until each application is complete.
- O. The manhole surface shall be damp without noticeable free water droplets or running water, but totally saturated just prior to application of coating. Materials shall be spray applied to a minimum total thickness of not less than ½".
- P. Trowel structure to a smooth surface, free of ridges and lumps. Brush with a semi-hard bristled masonry brush removing trowel marks, bug holes, or other imperfections in the liner.
- Q. After the walls are coated, the invert/bench covers shall be removed and the bench sprayed with coating material in such a manner as to have a gradual slope from the walls to the invert with the thickness at the invert to be no less than ½-inch. The wall/bench intersection built up and rounded to a uniform radius for the full circumference of the intersection. Trough area shall be coated as required to seal all cracks and to provide a smooth surface. The Contractor shall prepare a watertight seal and smooth transition between pipe penetrations (either lined pipe or unlined pipe) and manhole coating system. No leakage or gaps will be allowed. The method of sealing and preparing a smooth transition shall be approved by the Engineer.
- R. Cure materials in accordance with manufacturer's recommendations. As a minimum requirement, liner materials shall have the following minimum cure times before being subjected to flow:
 - 1. After final application of the liner material, a minimum of 4 hours cure time is required before subjecting liner material to storm run-off and surcharging flows.
 - 2. The liner material shall have a cure time of a minimum of 6 hours before being subjected to flows from force mains.
 - 3. The liner material shall have a cure time of a minimum of 12 hours before being subjected to street traffic.
 - 4. Cementitious liner shall have a cure time of a minimum of 48 hours before applying epoxy
- S. Minimize exposure of applied product to quick surface drying, sunlight, and air movement. If time between application of coats is to be longer than 10 minutes, place

cover on the manhole. In extremely hot and arid climates, manhole should be shaded while reconstruction is in process and a concrete curing agent shall be used. Curing compounds shall be in accordance with coating material manufacture's recommendations.

- T. After rehabilitation. Contractor shall dispose of waste materials and shall be responsible for locating and utilizing appropriate disposal sites. Contractor shall be responsible for any fees or tipping charges for disposal, if required. The Contractor must follow all current applicable local, state and federal rules and laws regarding the appropriate disposal of waste materials from cleaning operations. Under no circumstances shall sewage or solids removed in the cleaning process be dumped into streets, ditches, catch basins, storm drains, sewer manholes, wet wells, or cleanouts.

3.8 EPOXY PROTECTIVE LINER APPLICATION (EPOXY OR POLYURETHANE)

- A. Prepare the manhole as per the manufacturer's recommendations and as herein specified.
- B. Place covers over invert to prevent extraneous material from entering the sanitary sewer lines before cleaning. Any construction related material that enters the sewer mains shall be removed by the Contractor, at no additional cost to the Owner.
- C. All foreign material including but not limited to dirt, grease, sludge, mineral deposits, and debris shall be removed from the manhole wall, corbel, and bench using a high-pressure water spray (minimum of 3500 psi). If grease, chemicals, previous coatings or other surface contaminants are present, the surface shall be cleaned with steam, chemical cleaning compounds, or surface abrading as necessary to provide a clean substrate contact material. Loose and protruding brick, mortar, and concrete shall be removed using a mason's hammer and chisel and/or scraper.
- D. Visually verify the absence of leaks in the cementitious liner.
- E. Contractor shall remove and repair any surfaces of cementitious liner which may interfere with the proper application of the protective liner.
- F. Ventilate interior and exterior application areas, and all occupied spaces adjacent to application areas, during the application of grout.
- G. Where overspray or droppings may affect the benching or flow channels, the manhole base shall be covered with plywood and braced to provide a firm working platform.
- H. Application procedures shall be in accordance with the manufacturer's recommendations for material handling, safety, and environmental controls.
- I. Surfaces shall be coated by spray application of epoxy (polyurethane).
- J. The minimum dry film thickness shall be 125 mils.
- K. With flow blocked and invert cleared of all debris, Contractor shall apply protective liner (epoxy or polyurethane) to the water surface at the same time as applied to the bench.
- L. After the application of protective lining system, contractor shall apply sand (oven dried 20 to 30 gradation) to the bench area while the epoxy liner material is tacky to provide a non-slip surface.
- M. The coating shall cover the CIPP liner and truss pipe area entirely.

- N. For truss pipeline rehabilitation by CIPP liner at manholes, the epoxy liner shall overlap over the end of any truss pipe and then extend a minimum of 6-inches onto the CIPP liner. See Appendix D Detail 2.0 "Seal CIPP Lined Truss Pipe at Manhole Detail".

3.8 TESTING OF REHABILITATED MANHOLES

- A. Visual inspection of the finished product shall verify a leak free, uniform appearance. The cementitious and epoxy coating shall provide a continuous surface with uniform thickness throughout the manhole interior.
- B. Prior to the application of epoxy lining, all manholes shall be vacuum tested by the Contractor, as required by the Engineer and/or Owner. All manholes rehabilitated with cementitious shall pass a vacuum test in accordance with ASTM C1244. Vacuum testing shall be in accordance with Section 333913 "Sanitary Sewer Manholes, Frames, and Covers", and as described below.
- C. Vacuum testing shall be performed after liner material has appropriately cured, as recommended by liner material manufacturer or as specified herein.
- D. Contractor shall provide all test equipment and perform the test under witness by the Engineer and authorities having jurisdiction.
- E. Manholes shall be tested using the vacuum testing procedure:
1. Vacuum test head shall be positioned at the inside surface of the concrete at the top of the cone section and the seal inflated in accordance with the equipment manufacturer's instructions.
 2. A vacuum of 10-inches of mercury shall be drawn and the vacuum pump isolated by the shut-off valve on the test head connection.
 3. When valve is closed, time measurement shall commence, and the time required for vacuum drop to 9-inches of mercury shall be observed and recorded.
 4. The time measured for vacuum drop from 10-inches to 9-inches of mercury shall not be less than indicated in the following table:

Depth of Manhole (Feet)	Time in seconds for 1" Drop in Mercury		
	48" Diameter	60" Diameter	72" Diameter
<10'	20	26	33
10'	25	33	41
12'	30	39	49
14'	35	46	57
16'	40	57	67
18'	45	59	73
20'	50	65	81

Depth of Manhole (Feet)	Time in seconds for 1" Drop in Mercury		
	48" Diameter	60" Diameter	72" Diameter
22'	55	72	89
24'	59	78	97
26'	64	85	105
28'	69	91	113
30'	74	98	121

5. Manholes showing greater than the allowable leakage shall be repaired and re-tested until a satisfactory leakage result is obtained.
- F. All manholes with leaks in excess of the above shall be repaired or replaced. All corrective work shall be approved by the Engineer.
 - G. Repair or replace manholes failing the vacuum test and repeat testing until leakage is within allowances specified.
 - H. During application of the epoxy liner, a mil thickness gauge shall be used to ensure a monolithic lining and uniform thickness during application.
 - I. After the epoxy liner has cured and set, it shall be inspected with high voltage holiday detection equipment. Contractor shall be responsible for all testing. An induced holiday shall be made onto the coated surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect any induced holiday. All detected holidays shall be marked and repaired by abrading the coating with 40 grit disc paper or other hand tooling method. After abrading and cleaning, additional protective coating material can be hand or spray applied to the repair area. All touch-up and repair procedures shall be in accordance with the manufacturer's recommendations.
 - J. The Engineer will visually inspect manholes during all phases of construction. The level of inspection is at the discretion of the Engineer and will be based partly on the Contractor's ability, experience, and past performance. All work not conforming to these Specifications and/or Drawings shall be corrected by the Contractor.
 - K. Seal of pipe at new or existing manholes will be inspected upon completion of each line segment and again at final inspection prior to final acceptance of the project. No visible leaks shall be allowed. Should a leak be present at any of the inspection times it will be the responsibility of the Contractor to stop the leak with a method approved by the Engineer. All retainage being held by the Owner will be retained until such time as all visible leaks have been repaired to the Engineer's satisfaction. Any leaks discovered during the warranty period shall be repaired under the Warranty and within a timely fashion.

END OF SECTION

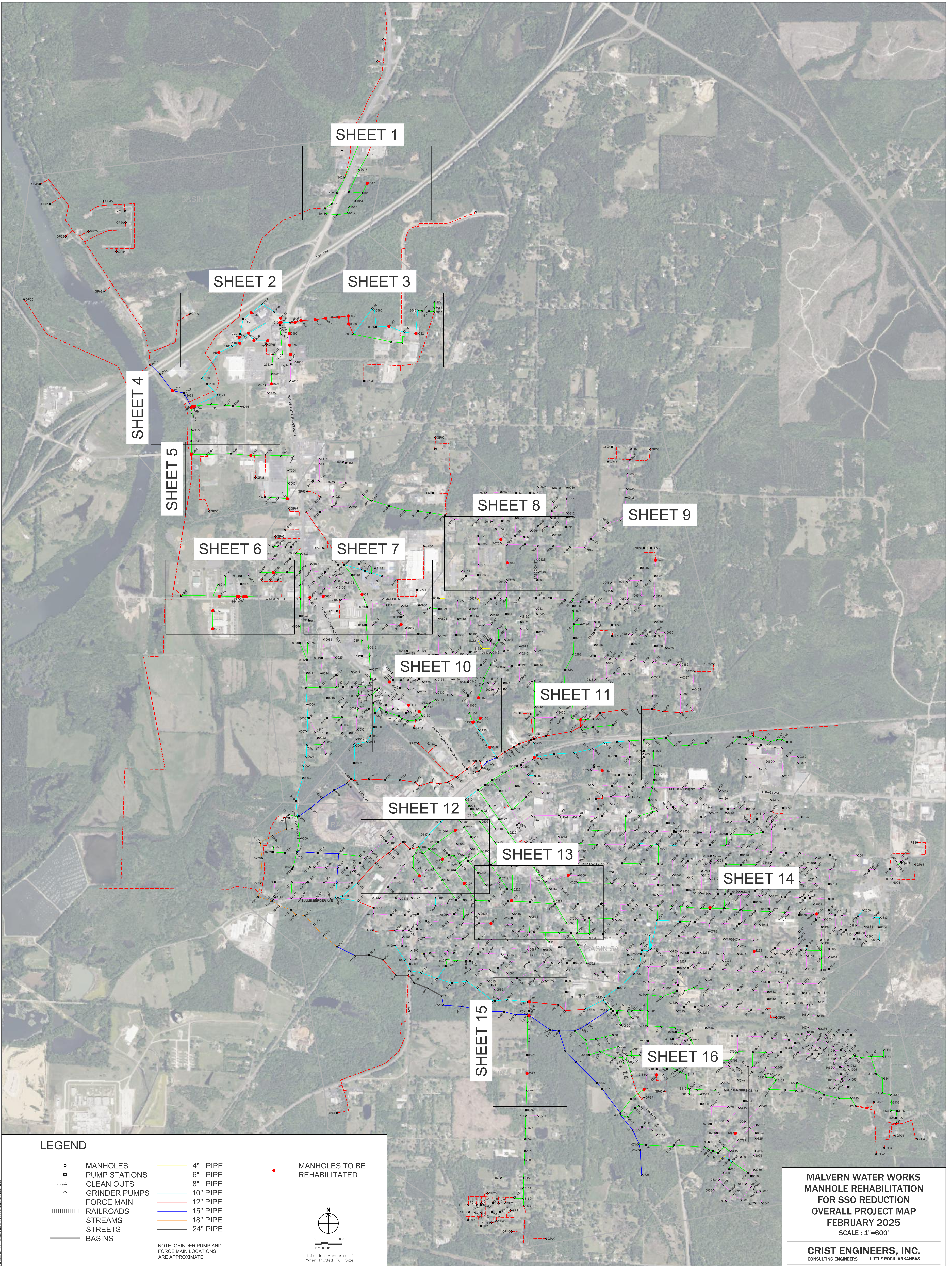
APPENDIX A
MANHOLE REHABILITATION
SUMMARY & MAP

Appendix A - Manhole Rehabilitation Summary

Basin	Manhole ID	Address	Type	Surface	MH Dia. (in)	Depth (ft)	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
1	1007	1526 Gardiner St	Fiberglass	Non-Paved	48	6.33			1					
1	0996	1921 Martin Luther King Blvd	Poured Concrete	Non-Paved	40	8.03			1					
1	1009	2320 Leopard Ln	Precast Concrete	Non-Paved	48	12.59		1	1	1	12.59			
1	1010	2320 Leopard Ln	Precast Concrete	Non-Paved	48	15.83		1		1	15.83			
1	1003	2320 Leopard Ln	Precast Concrete	Non-Paved	48	16.48		1		1				
1	1160	2600 S River Creek Dr	Poured Concrete	Non-Paved	48	11.00					11.00			
1	1026	398 Riverview Dr	Fiberglass	Non-Paved	48	3.75							1	
1	2500	445 Riverview Dr	Poured Concrete	Non-Paved	48	13.68					13.68			
1	1168	2727 S River Creek Rd	Poured Concrete	Non-Paved	48	9.90			1					
1	1165	1600 S River Creek Dr	Poured Concrete, Precast Concrete	Non-Paved	48	10.40			1		10.40			
1	1163	2660 River Creek Rd	Precast Concrete	Non-Paved	48	8.00				1				
1	0998	1626 Industrial Park Dr	Poured Concrete	Non-Paved	48	5.05			1					
1	0997	1656 Industrial Park Dr	Fiberglass	Non-Paved	48	5.00							1	
1	0996	1921 Martin Luther King Blvd	Fiberglass	Non-Paved	48	4.40			1					
1	0994	2668 Oliver Lancaster Blvd	Poured Concrete	Non-Paved	48	10.13			1		10.13			
1	0993	2668 Oliver Lancaster Blvd	Poured Concrete	Non-Paved	48	9.78		1		1				
1	0989	104 Industrial Park Rd	Poured Concrete	Non-Paved	48	8.52					8.52			
1	0990	104 Industrial Park Rd	Poured Concrete	Non-Paved	48	8.98			1					
1	0991	2668 Oliver Lancaster Blvd	Poured Concrete	Non-Paved	48	9.65			1					
1	0988	1932 Industrial Park Dr	Poured Concrete	Non-Paved	48	9.63			1					
1	0982	117 Industrial Park Dr	Poured Concrete	Paved	48	9.45	1							
1	0984	117 Industrial Park Dr	Poured Concrete	Non-Paved	48	8.52		1						
1	1017	3402 Oliver Lancaster Blvd	Fiberglass	Non-Paved	48	4.33			1					
1	1092	1889 Tanner St	Fiberglass, Poured Concrete	Paved	48	7.90							1	
1	1089	1585 Tanner St	Poured Concrete	Non-Paved	48	6.22					6.22			
	3071	1750 W Moline St	Poured Concrete	Non-Paved	48	7.42		1		1				
	3072	1820 W Moline St	Precast Concrete	Non-Paved	48	8.36			1					
	3073	1840 W Moline St	Precast Concrete	Paved	48	8.12	1							
	3076	1820 W Moline St	Precast Concrete	Non-Paved	48	7.56			1					
1	3063	2730 River Creek Rd	Poured Concrete	Non-Paved	48	11.20		1						
1	3057	2615 S River Creek Dr	Poured Concrete	Paved	48	7.02			1					
1	3058	2300 Leopard Ln	Precast Concrete	Paved	48	6.67			1					
1	3059	2300 Leopard Ln	Precast Concrete	Paved	48	7.90			1					
1	1026	456 Riverview Dr	Poured Concrete	Non-Paved	48	14.65		1						
1	2156	445 Riverview Dr	Poured Concrete, Precast Concrete	Non-Paved	48	12.14					12.14			
1	3060	448 Riverview Dr	Precast Concrete	Non-Paved	48	14.85				1				
1	7002	1611 Martin Luther King Blvd	Poured Concrete	Paved	48	6.20			1					
1	3075	1820 Moline St	Poured Concrete	Non-Paved	48	7.30							1	
1	6012	1747 W Moline St	Precast Concrete	Paved	48	7.12					7.12			
1	6013	1807 W Moline St	Poured Concrete	Paved	48	9.00					9.00			

Basin	Manhole ID	Address	Type	Surface	MH Dia. (in)	Depth (ft)	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8
3	0118	1002 Elmo St	Poured	Nonpaved	48	7.82						1		
2	0680	1512 Pinehurst St	N/A	Paved	48	4.04	1							
2	0611	1247 Brownwood St	Brick	Nonpaved	48	5.51		1					1	
2	0600	1211 Brownwood St	Poured	Nonpaved	48	4.82		1	1					
5	0569	1919 Dyer St	Rehab	Nonpaved	48	8.69		1	1					
2	0618	936 McKinney St	Brick	Paved	48	9.04	1				9.04			
5A	0179	630 W 3rd St	Brick	Paved	48	7.04	1						1	
5	2182A	825 Sulphur Springs Rd	Poured	Nonpaved	48	5.61			1			1		
5A	0221	203 W Sullenberger Ave	Brick	Paved	48	14.48	1							1
3	1074A	1203 Grayson Cir	N/A	Nonpaved	48	3.71			1			1		
3	0152	229 N Laurel St	Rehab	Nonpaved	48	5.80					5.80			
5A	0197	423 5th St	Brick	Paved	48	5.55					5.55			
5A	0189	205 Vine St	Rehab	Paved	48	5.84	1		1					
2	0590	846 W Moline St	Rehab	Paved	48	4.84	1							
3	0153	211 N Laurel St	N/A	Nonpaved	39	5.08				1		1		
5	2185	825 Sulphur Springs Rd	Poured	Nonpaved	48	6.04			1	1		1		
5A	0191	513 W 3rd St	N/A	Paved	46	4.85			1		4.85	1		
5	1094	2432 Briarwood Dr	N/A	Nonpaved	42	4.19		1				1		
3A	1046	307 Overman St	Precast	Nonpaved	48	4.27		1						
5A	0289	345 Clem St	N/A	Paved	46	5.45			1		5.45	1		
3	0256	100 Babcock St	Not Visible	Nonpaved	46	10.34		1						
3	0651	212 W Moline St	Precast	Nonpaved	48	9.81		1						
4	2238	1423 Roosevelt St	Precast	Paved	24	2.70	1							
3	0131	201 Hot Springs St	Precast	Nonpaved	48	8.81		1						
3	0157A	170 N Laurel St	Precast	Nonpaved	48	4.74		1						
5	0573	2202 Dyer St	Poured	Paved	48	6.41	1							
5	0548	232 W Highland Ave	Rehab	Nonpaved	48	7.69		1	1					
4	2512	2005 E Sullenberger Ave	Rehab	Paved	48	5.49	1						1	
5	0565	1810 Dyer St	Rehab	Nonpaved	48	8.41		1						
3	0114	400 Martin Luther King Blvd	Poured	Paved	48	5.58	1							
3	0330	UKN Veneer St	Not Visible	Paved	48	7.24	1							
3	0944	1112 N Banks St	N/A	Paved	48	5.61	1							
4	2243	1125 Cherry Ln	Poured	Paved	48	7.24	1							
3	0158	104 N Laurel St	Poured	Nonpaved	35	5.72		1						
Totals							15	20	27	9	147.32	8	7	1

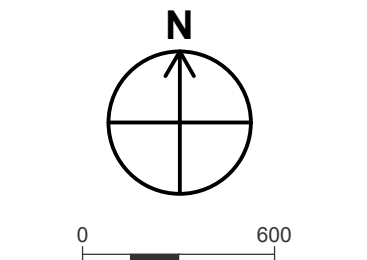
Group 1 - Manhole Frame/Cover - Remove, Replace, Raise to Grade (Paved Area)
 Group 2 - Manhole Frame/Cover - Remove, Replace, Raise to Grade (Non-Paved Area)
 Group 3 - Grout, Seal, and Waterproof Lower 18" of Manhole with 1/2-inch Cementitious L
 Group 4 - Repair/Install Chimney Seal
 Group 5 - Seal and Waterproof Manhole with 1/2-inch Cementitious Liner
 Group 6 - Repair/Construct Manhole Bench/Trough and Invert
 Group 7 - Complete Manhole Replacement
 Group 8 - Complete Manhole Rehabilitation



LEGEND

- MANHOLES
- PUMP STATIONS
- CLEAN OUTS
- GRINDER PUMPS
- FORCE MAIN
- RAILROADS
- STREAMS
- STREETS
- BASINS
- 4" PIPE
- 6" PIPE
- 8" PIPE
- 10" PIPE
- 12" PIPE
- 15" PIPE
- 18" PIPE
- 24" PIPE
- MANHOLES TO BE REHABILITATED

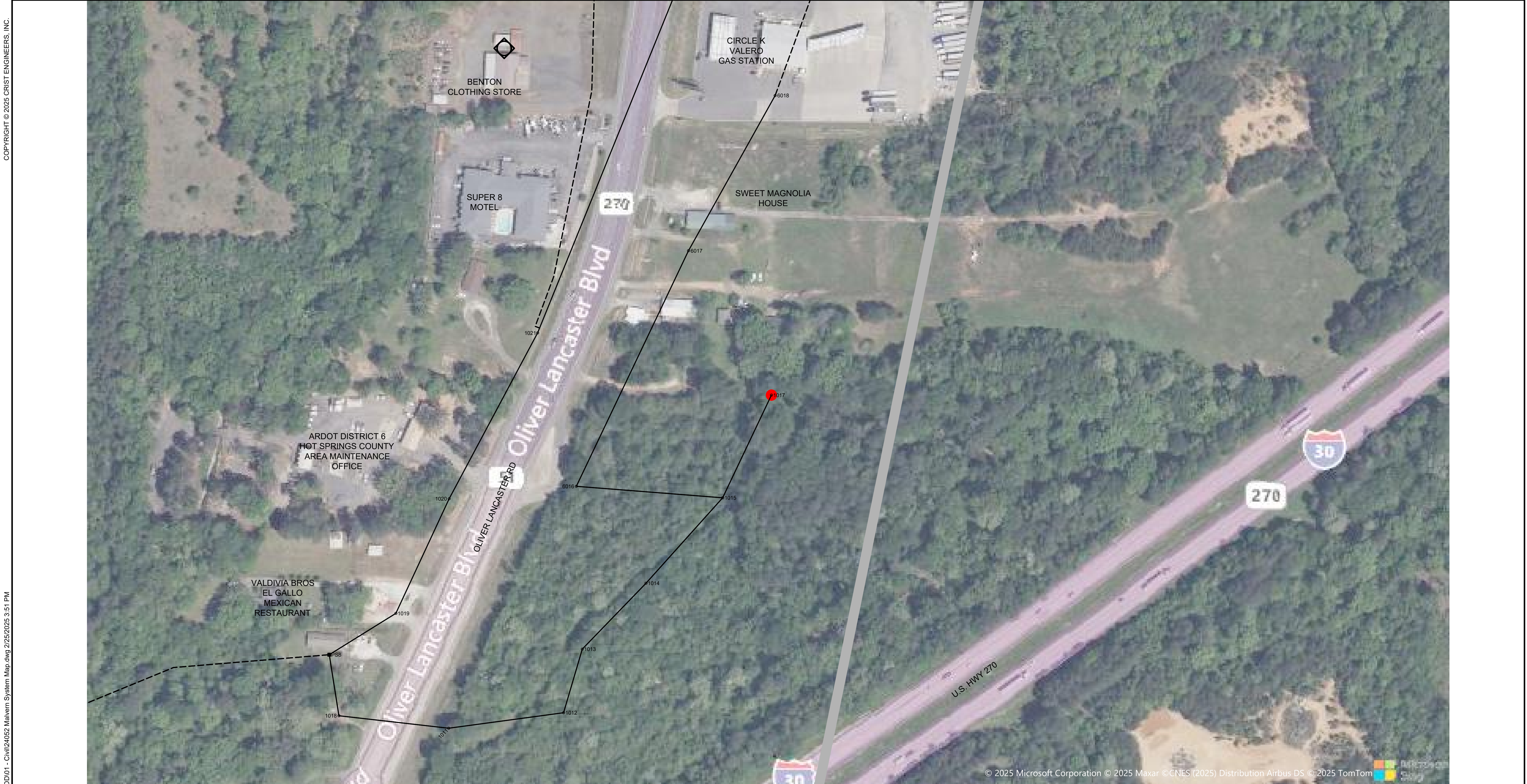
NOTE: GRINDER PUMP AND FORCE MAIN LOCATIONS ARE APPROXIMATE.



This Line Measures 1" When Plotted Full Size

MALVERN WATER WORKS
MANHOLE REHABILITATION
FOR SSO REDUCTION
OVERALL PROJECT MAP
FEBRUARY 2025
SCALE: 1"=600'

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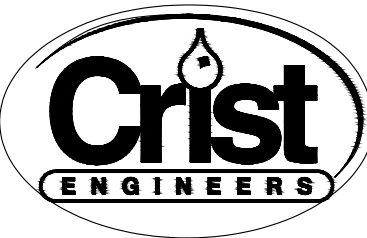
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REV. NO.	DATE	DRWN	CHKD	REMARKS

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MALVERN, ARKANSAS

MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 1 OF 16

JOB NO.	24052
SHEET NO.	1

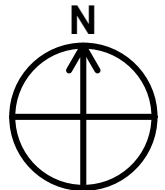


LEGEND

- MANHOLES
- PUMP STATIONS
- c.o.△ CLEAN OUTS
- ◇ GRINDER PUMPS
- FORCE MAIN
- + + + + + RAILROADS
- ▬ BASINS
- ▬ SEWER MAIN

● MANHOLES TO BE REHABILITATED

NOTE: GRINDER PUMP AND FORCE MAIN LOCATIONS ARE APPROXIMATE.

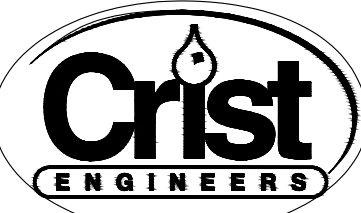


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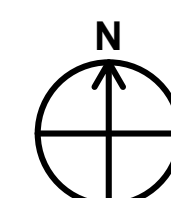
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SHEET NO.	2



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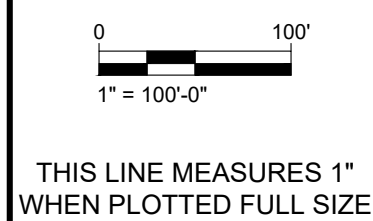
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|-------|---------------|-------|------------|--------------------------------|
| ○ | MANHOLES | ----- | FORCE MAIN | |
| □ | PUMP STATIONS | +++++ | RAILROADS | |
| c.o.△ | CLEAN OUTS | ===== | BASINS | ● MANHOLES TO BE REHABILITATED |
| ◇ | GRINDER PUMPS | ===== | SEWER MAIN | |

[illegible]



○	MANHOLES	----	FORCE MAIN
□	PUMP STATIONS	+++++	RAILROADS
c.o.△	CLEAN OUTS	=====	BASINS
◇	GRINDER PUMPS	————	SEWER MAIN

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MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 4 OF 16

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24052

EET NO.

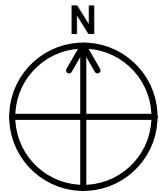


LEGEND

- MANHOLES
- PUMP STATIONS
- △ CLEAN OUTS
- ◇ GRINDER PUMPS
- FORCE MAIN
- +++++ RAILROADS
- BASINS
- SEWER MAIN

● MANHOLES TO BE REHABILITATED

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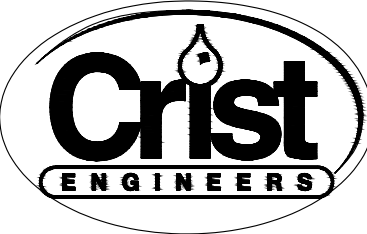


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MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 5 OF 16

JOB NO.	24052
SHEET NO.	5

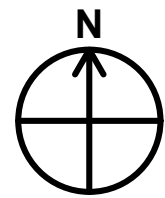


LEGEND

- MANHOLES
- PUMP STATIONS
- c.o.△ CLEAN OUTS
- ◇ GRINDER PUMPS
- FORCE MAIN
- + + + + + RAILROADS
- BASINS
- SEWER MAIN

● MANHOLES TO BE REHABILITATED

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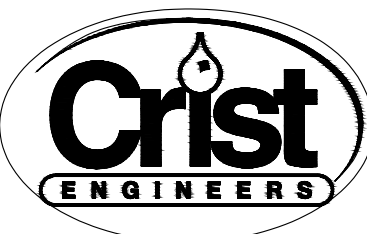


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MALVERN WATER WORKS
REGULATORY REVIEW SET
SHEET 6 OF 16

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SHEET NO.	6



LEGEND

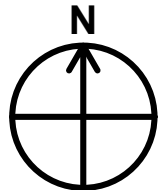
- MANHOLES
- PUMP STATIONS
- c.o.△

CLEAN OUTS
- ◇

GRINDER PUMPS
- FORCE MAIN
- +++++

RAILROADS
- BASINS
- SEWER MAIN

● MANHOLES TO BE REHABILITATED



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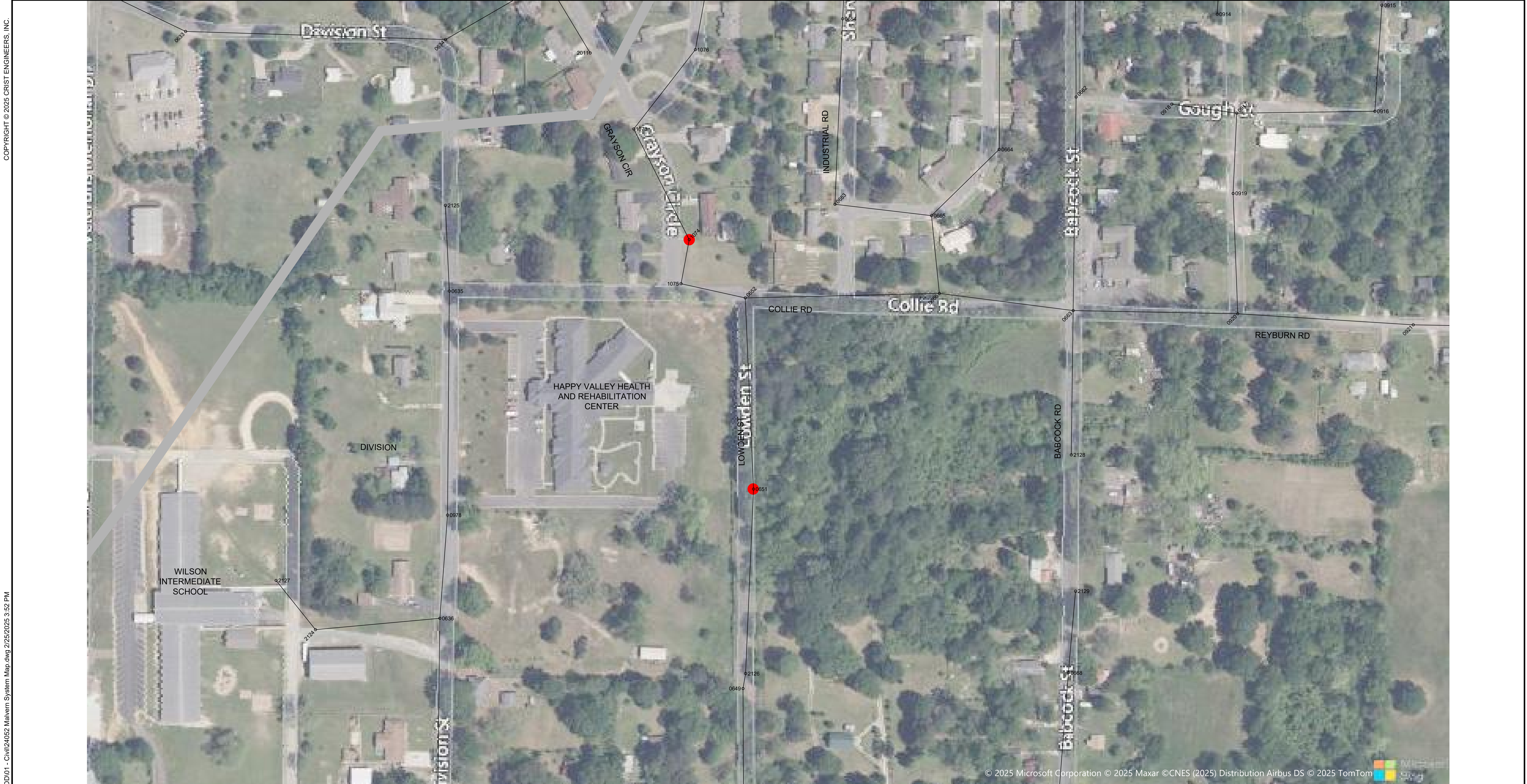
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MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

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SHEET NO.	7



LEGEND

- MANHOLES
- PUMP STATIONS
- c.o.△

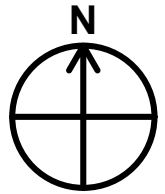
CLEAN OUTS
- ◇

GRINDER PUMPS
- FORCE MAIN
- +++++

RAILROADS
- BASINS
- SEWER MAIN

● MANHOLES TO BE REHABILITATED

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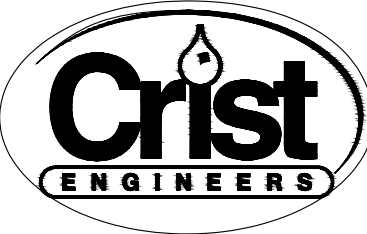


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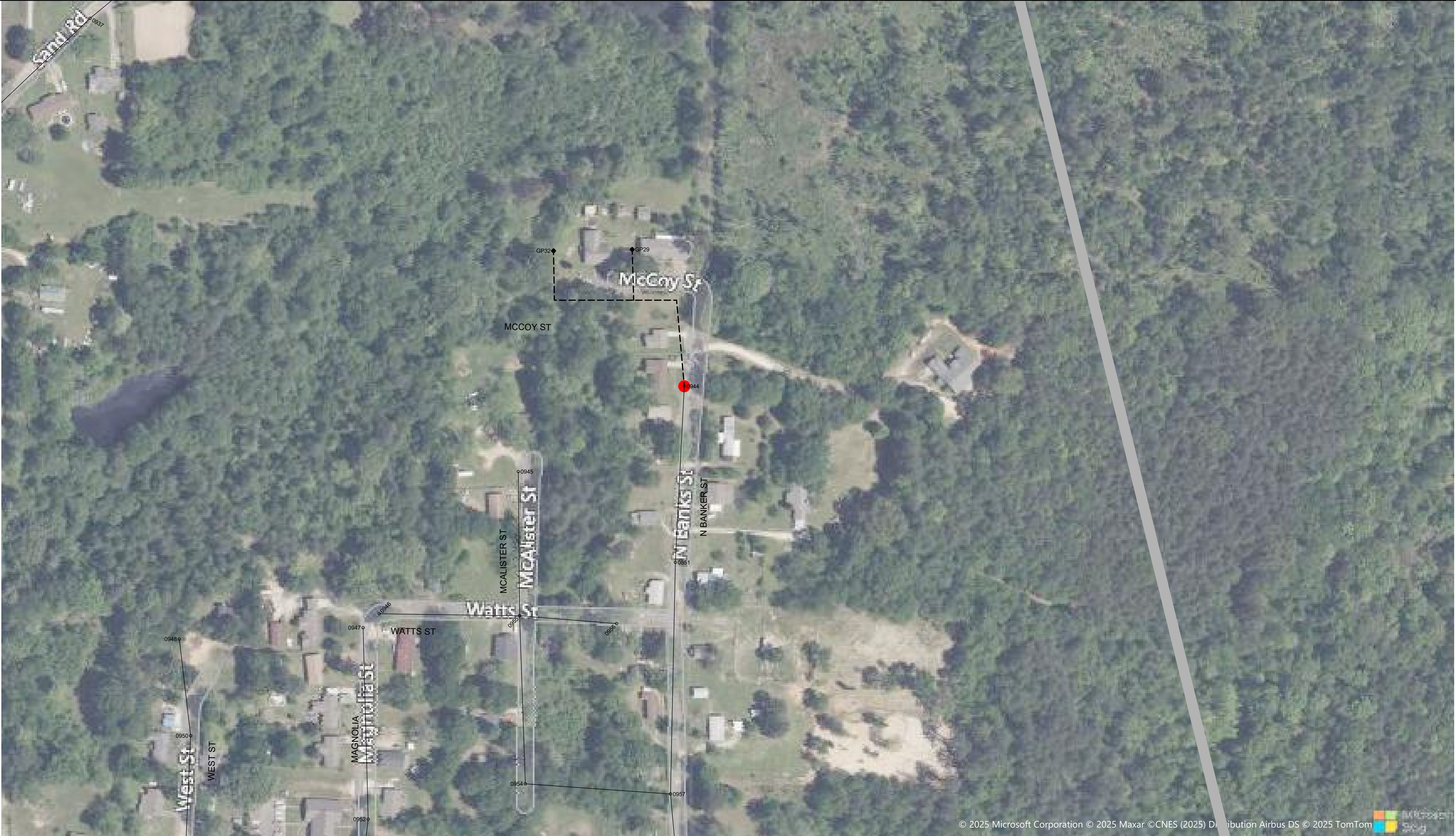
MALVERN, ARKANSAS

MANHOLE REHABILITATION FOR SSO REDUCTION

MALVERN WATER WORKS

REGULATORY REVIEW SET

JOB NO.	24052
SHEET NO.	8

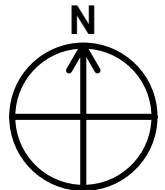


LEGEND

- MANHOLES
- PUMP STATIONS
- c.o.△ CLEAN OUTS
- ◇ GRINDER PUMPS
- FORCE MAIN
- +++++ RAILROADS
- BASINS
- SEWER MAIN

● MANHOLES TO BE REHABILITATED

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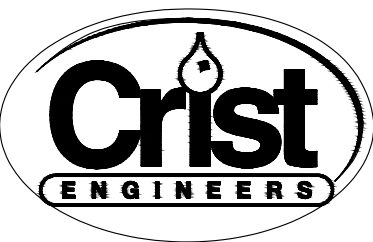


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MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

REGULATORY REVIEW SET

JOB NO.	24052
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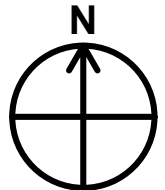


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NOTE: GRINDER PUMP AND FORCE MAIN LOCATIONS ARE APPROXIMATE.



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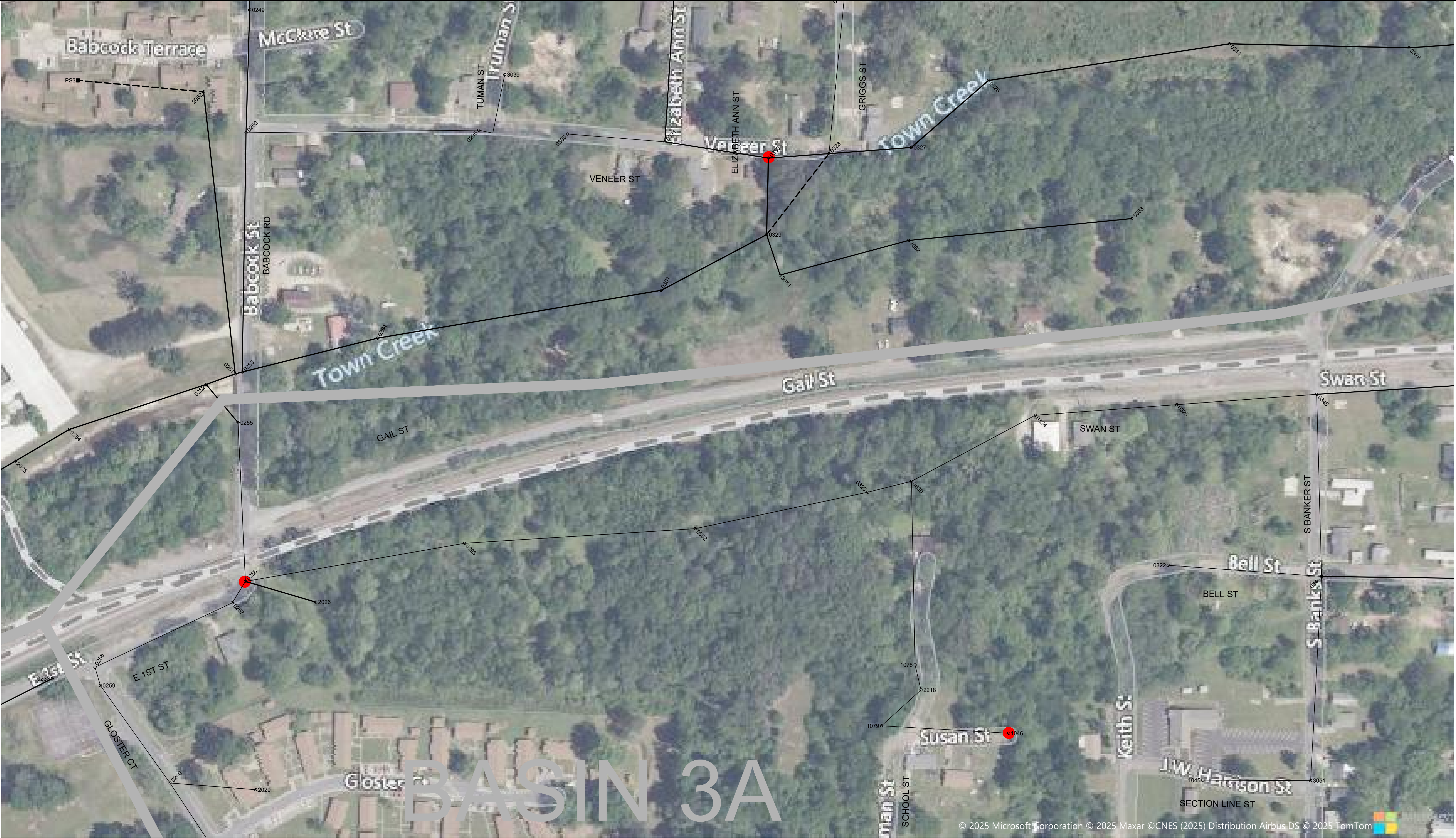
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TELEPHONE: (501) 664-1552
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WWW.CRISTENGINEERS.COM

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MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS
REGULATORY REVIEW SET

JOB NO.	24052
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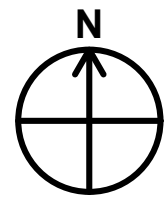
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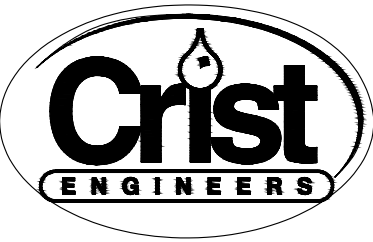


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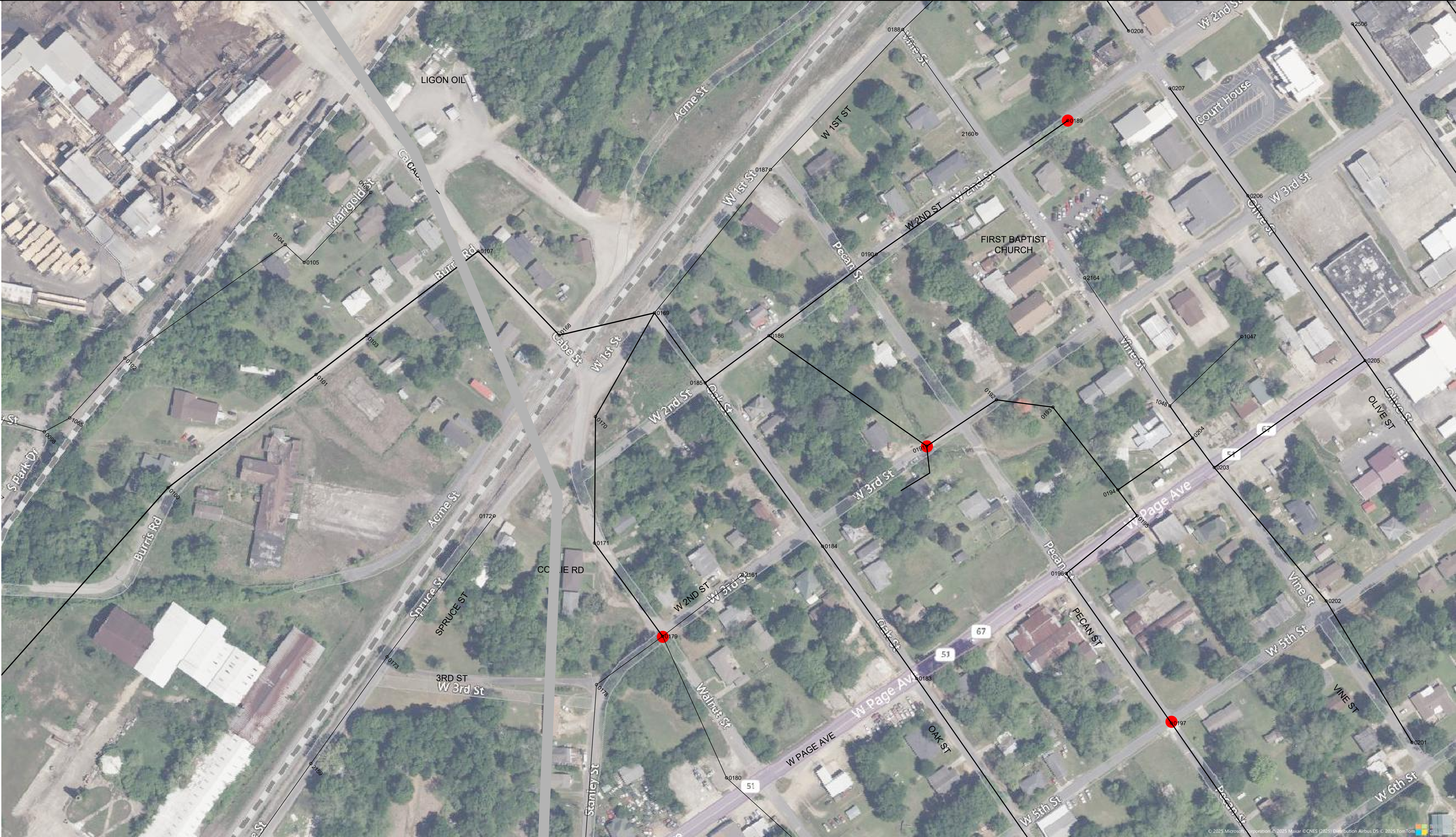
MALVERN, ARKANSAS

MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 11 OF 16

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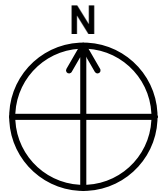


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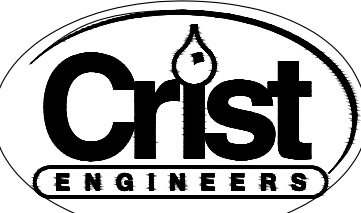


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MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 12 OF 16

JOB NO.	24052
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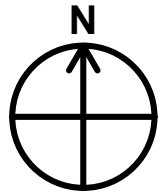


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MANHOLE REHABILITATION FOR SSO REDUCTION

MALVERN WATER WORKS

REGULATORY REVIEW SET

SHEET 13 OF 16

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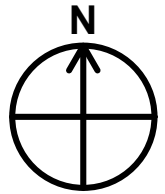


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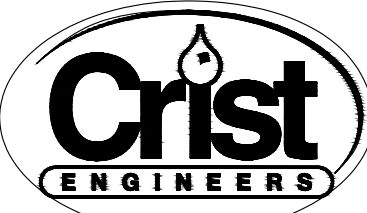


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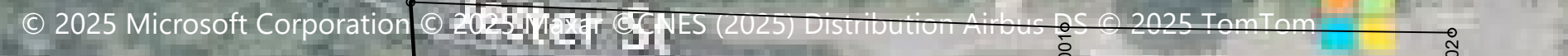
MALVERN, ARKANSAS

MANHOLE REHABILITATION FOR SSO REDUCTION

MALVERN WATER WORKS

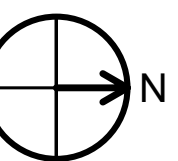
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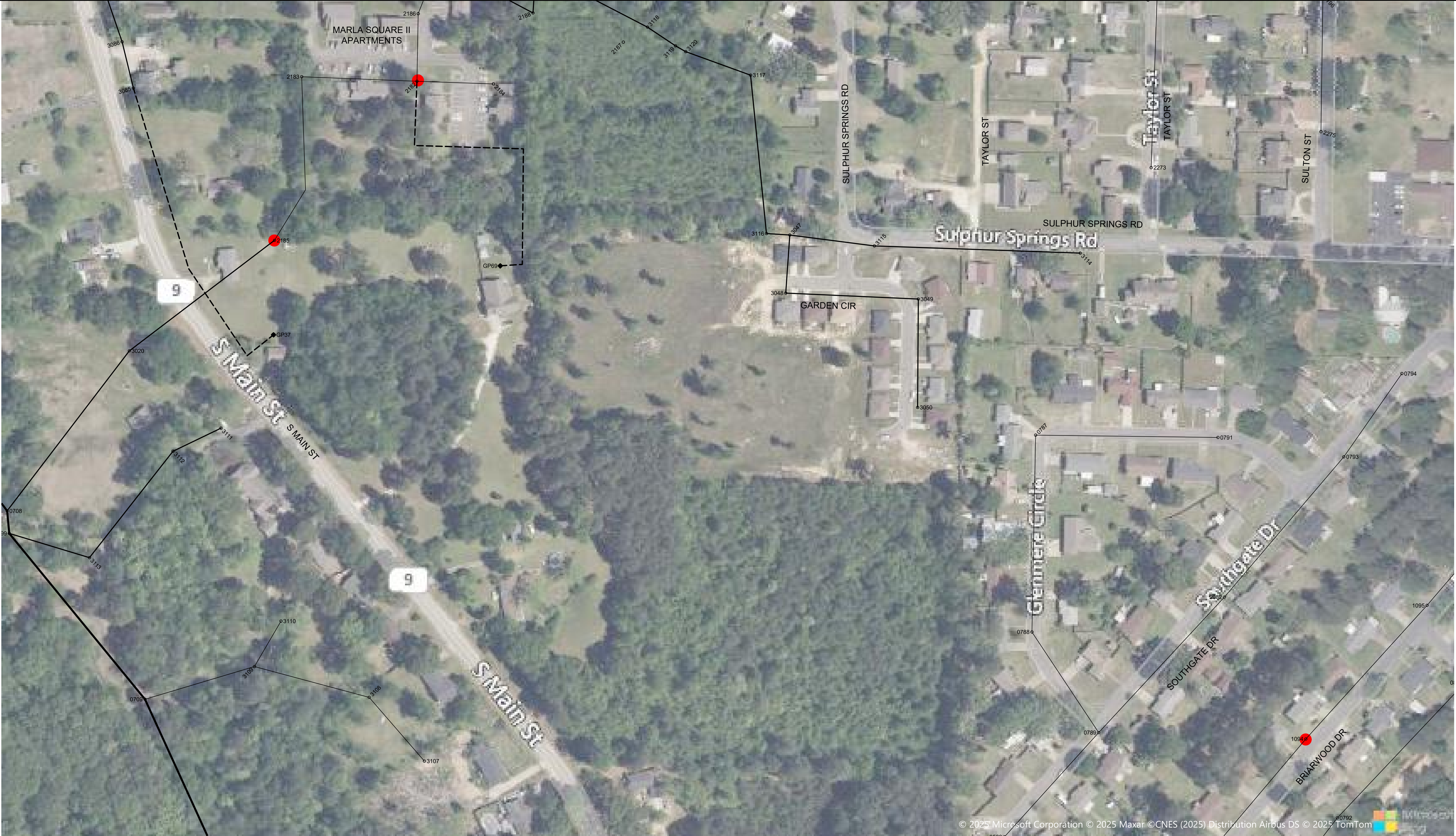
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NOTE: GRINDER PUMP AND FORCE MAIN LOCATIONS ARE APPROXIMATE.

- MANHOLES TO BE REHABILITATED

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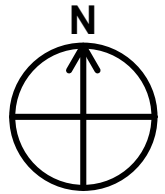


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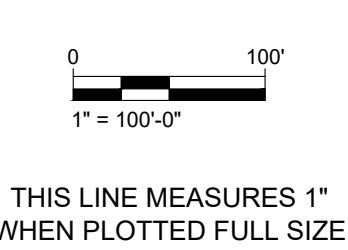
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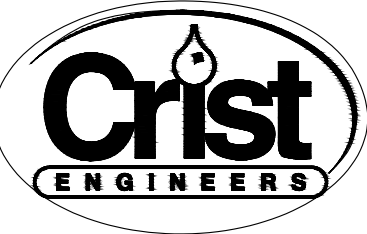
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MALVERN, ARKANSAS
MANHOLE REHABILITATION FOR SSO REDUCTION
MALVERN WATER WORKS
REGULATORY REVIEW SET

JOB NO.	24052
SHEET NO.	16

APPENDIX B
REVOLVING LOAN FUND (RLF)
DOCUMENTS

REVOLVING LOAN FUND (RLF) SUPPLEMENTAL GENERAL CONDITIONS

- | | |
|---|---|
| 1. Project Funding | 33. Owner's Protection from Contractor's Actions |
| 2. Supersession | 34. Inspection & Testing |
| 3. Definitions | 35. Supervision by Contractor |
| 4. Additional Instructions & Detail Drawings | 36. Payment to Contractor |
| 5. Drawings & Specifications | 37. Acceptance of Final Payment as Release |
| 6. Land & Rights-of-Way | 38. Cleanup and Corrections |
| 7. Bidding and Contract Award | 39. Taxes |
| 8. American Iron and Steel (AIS) | 40. State Tax Exemption |
| 9. Disadvantaged, Minority, Women's Business Enterprises | 41. Operation and Maintenance Manual |
| 10. Equal Employment Opportunity Clause | 42. Changes in the Work |
| 11. Labor Standards | 43. Subsurface Conditions |
| 12. Responsibilities of Participants Regarding Transactions (A.K.A. Debarment and Suspension) | 44. Correction of Work |
| 13. Procurement Prohibitions | 45. Surveys, Permits, Regulations |
| 14. Substitutions | 46. Time for Completion & Liquidated Damages |
| 15. Insurance | 47. Suspension of Work, Termination, & Delay |
| 16. Contract Security | 48. As-Built Drawings |
| 17. Assignments | 49. Guarantee |
| 18. Indemnification | 50. Patents |
| 19. Separate Contracts | 51. Conflicts of Interest |
| 20. Subcontracting | 52. Arbitration by Mutual Agreement |
| 21. Pre-Construction Conference | 53. Gratuities |
| 22. Schedules, Reports & Records | 54. Prohibition on Telecommunication and Video Surveillance Services or Equipment |
| 23. Job Bulletin Board | Appendix A Labor Standards Provisions, Attachments 1 & 2 |
| 24. Shop Drawings | Appendix B Equal Employment Opportunity Provisions, Title 41, Chapter 60 |
| 25. Materials, Services & Facilities | Appendix C 40 CFR Part 33 Subpart C: Good Faith Efforts |
| 26. Safety Standards | Appendix D. Memo: Implementation of American Iron and Steel (AIS) |
| 27. Protection of Lives and Property | Appendix E. Memo: Prohibition on Certain Telecommunication and Video Surveillance Services or Equipment in the SRF Programs |
| 28. Protection of Work, Property, and Persons | |
| 29. Protection of the Environment | |
| 30. Archeological, Historical, and Cultural Remains | |
| 31. Storm Water Permit Requirements | |
| 32. Engineer's Authority | |

1. PROJECT FUNDING

These Supplemental General Conditions are based on detailed, specific guidance provided by the United States Environmental Protection Agency (US EPA).

In accordance with Title XV and XVI, the Arkansas Natural Resources Commission (Commission) and the Arkansas Development Finance Authority (ADFA) is not a partner, joint venture or in any way party to the construction contract. The Recipient and its Contractors shall release and hold harmless the officers and employees of the Commission and ADFA from claims arising in connection with the design, construction and operation of the project including any matter due solely to the Contractor or Borrowers negligence.

2. SUPERSESSSION

These Supplemental General Conditions supersede any conflicting provisions of the Contract Documents.

3. DEFINITIONS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:

- A. **Addenda** - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Drawings and Specifications, by additions, deletions, clarifications, or corrections.
- B. **Bid** - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- C. **Bidder** - Any person, firm or corporation submitting a Bid for the Work.
- D. **Bonds** - Bid, Performance, and Payment Bonds and other instruments of surety, furnished by the Contractor and the Contractor's surety in accordance with the Contract Documents.
- E. **Change Order** - A written order to the Contractor authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.
- F. **Commission** - The Arkansas Natural Resources Commission.
- G. **Contract Documents** - The contract, including Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications, General Conditions, Supplemental General Conditions, and Addenda.
- H. **Contract Price** - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.
- I. **Contract Time** - The number of calendar days stated in the Contract Documents for the completion of the Work.
- J. **Contractor** - The person, firm or corporation with whom the Owner has executed the Agreement.
- K. **Drawings** - The parts of the Contract Documents, which show the characteristics, and scope of the Work to be performed and which have been prepared or approved by the Engineer.

- L. **Engineer** - The person, firm, or corporation named as such in the Contract Documents.
- M. **Field Order** - A written order effecting a change in the Work not involving an adjustment in the Contract Price, an extension of the Contract Time, or a change affecting the overall integrity of the design of the project issued by the Engineer, not the Engineer's Resident Inspector, to the Contractor during construction.
- N. **Notice of Award** - The written notice of the acceptance of the Bid from the Owner to the successful Bidder.
- O. **Notice to Proceed** - Written communication issued by the Owner to the Contractor authorizing him/her to proceed with the Work and establishing the date for commencement of the Work.
- P. **Owner** - A public or quasi-public body or authority, corporation, association, partnership, or an individual for whom the Work is to be performed.
- Q. **Project** - The undertaking to be performed as provided in the Contract Documents.
- R. **Resident Project Representative** - The authorized representative of the Owner who is assigned to the Project site or any part thereof.
- S. **Shop Drawings** - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, Supplier or distributor, which illustrates how specific portions of the Work shall be fabricated or installed.
- T. **Specifications** - A part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.
- U. **Subcontractor** - An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.
- V. **Substantial Completion** - That date certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it is intended.
- W. **Additional Supplemental General Conditions** - Modifications to Supplemental General Conditions required by a State agency for participation in the Project and approved by the agency in writing prior to inclusion in the Contract Documents, or such requirements that may be imposed by applicable state laws.
- X. **Supplier** - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.
- Y. **Work** - All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in the Project.
- Z. **Written Notice** - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address, or delivered in person to said party or their authorized representative on the Work.

4. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- A. The Contractor may be furnished additional instructions and detail drawings, by the Engineer, as necessary to carry out the Work required by the Contract Documents.
- B. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detailed drawings and instructions.

5. DRAWINGS AND SPECIFICATIONS

- A. The intent of the Drawings and Specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the Work in accordance with the Contract Documents and all incidental work necessary to complete the Project in an acceptable manner, ready for use, occupancy or operation by the Owner.
- B. In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over general Drawings.
- C. Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.
- D. In the case of defective Specifications for which the Owner is responsible, the equitable adjustment shall include any increased cost the Contractor reasonably incurred in attempting to comply with those defective Specifications.

6. LAND AND RIGHTS-OF-WAY

- A. Prior to issuance of Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.
- B. The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.
- C. The Contractor shall provide at its own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

7. BIDDING AND CONTRACT AWARD

- A. Prospective Bidders are advised that other sections of these Supplemental General Conditions describe requirements pertaining to bidding and the performance of the RLF funded contract. The Supplemental General Conditions should be thoroughly reviewed by prospective Bidders prior to the preparation and submission of bids.

- B. Awards shall be made only to the lowest responsive, responsible Contractors possessing the ability to perform successfully under the terms and conditions of the proposed procurement. Bidders are required to comply with the requirements of these Supplemental General Conditions in the preparation and submission of bids. Failure by the bidder to comply with the requirements outlined herein may result in the rejection of the bid as non-responsive.
- C. Bidders shall submit with the bid proposal an executed Contractor's Act of Assurance form as provided in these contract documents. Through execution of this form, the Bidder warrants its understanding of and compliance with these Supplemental General Conditions and all relevant requirements pertaining to the RLF funded work. In addition, each prime Contractor is required to submit an executed Contractor's Act of Assurance form to the Owner for each subcontract awarded above \$2,000.00.
- D. The information described below shall be submitted to the Commission by the Owner for review and approval within thirty days of bid opening. Construction contracts will not be Awarded without Commission concurrence.
- i. Proposal of the lowest responsive responsible Bidder.
 - ii. Bid tabulation showing all bids and bid opening date.
 - iii. Recommendation of Award of contract by Engineer.
 - iv. Clear Site Certificate without exceptions.
 - v. Certified copies of the advertisements for bids.
 - vi. Bid bond for and name of Surety Company that will underwrite the Payment and Performance Bonds for the lowest responsive responsible Bidder.
 - vii. Itemized bid breakdown of lump sum bid from lowest responsive responsible Bidder (if applicable).
 - viii. Resume(s) of the proposed resident inspector(s).
 - ix. Contractors Act of Assurance Form
 - x. DBE/MBE/WBE documentation from lowest responsive responsible Bidder within fifteen days of bid opening.
- Items (vi.), (vii.), (viii), (ix.), and (x.) shall be submitted by the lowest responsive responsible Bidder to the Owner within fifteen days of bid opening for transmittal to the Commission.
- E. If the Owner has not already enacted a written protest procedure to handle and resolve disputes relating to the award of contracts, the Owner will follow the process below upon receipt of a bid protest:
- i. Bid protests may be filed by an "interested party." Prior to a bid submittal deadline, these persons include any party who declares an interest in the solicitation. Following the bid submittal deadline, interested parties include only bidders who submitted a bid or response to the solicitation.
 - ii. The written protest shall specify the reasons and facts upon which the protest is based; specific portions of the documents or statutes that form the basis of the protest; and the name, address, and telephone number of the party representing the Bidder.

- iii. The protest must be filed in writing with the Owner at the address below:

Attn: _____

_____, AR _____

- iv. The protest must be filed with the Owner before 5 p.m. and no later than five business days after the date of the Bid opening.
- v. Owner must disclose all bid protests to the Commission immediately.
- vi. Owner will investigate the basis for the bid protest and analyze the facts. Owner will notify Bidder whose bid is the subject of the bid protest of evidence presented in the bid protest and evidence found as a result of the investigation, and, if deemed appropriate, afford Bidder an opportunity to rebut such evidence, and permit Bidder to present evidence that it should be allowed to perform the work. If deemed appropriate by Owner, an informal hearing will be held.
- vii. Owner will issue a written decision within 15 days following receipt of the bid protest, unless factors beyond Owner's reasonable control prevent such a resolution, in which event such decision will be issued as expeditiously as circumstances reasonably permit. The decision will state the reasons for the action taken by Owner. A copy of the decision will be furnished to the protestor, the Commission, the Bidder whose bid is the subject of the bid protest, and all Bidders affected by the decision. A Bidder is affected by the decision on a bid protest if a decision on the protest could have resulted in the Bidder not being the lowest responsible and responsive Bidder for the contract.

8. AMERICAN IRON AND STEEL (AIS)

The Contractor acknowledges to and for the benefit of the Owner and the Commission that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund that have 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 including iron and steel products provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Owner and the Commission 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 Owner or the Commission. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or Commission to recover as damages against the Contractor any loss, expense, or cost (including without

limitation attorney's fees) incurred by the Owner or Commission resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the Commission or any damages owed to the Commission by the Owner). While the Contractor has no direct contractual privity with the Commission, as a lender to the Owner for the funding of its project, the Owner and the Contractor agree that the Commission 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 Commission. A copy of the EPA Memorandum implementing the American Iron and Steel requirement and its procedures is attached as Appendix D to these Supplemental General Conditions.

9. DISADVANTAGED, MINORITY, AND WOMEN'S BUSINESS ENTERPRISES

Whenever subcontracts are solicited, the Contractor is required to take affirmative steps (known as "good faith efforts") to assure that disadvantaged business enterprises (DBE), which includes small and minority and women's business enterprises (MBE/WBE) as well, are used when possible as sources of materials, supplies, equipment, construction activities and professional services. DBE utilization is authorized by 40 CFR Parts 30, 31, 33, 35, and 40, OMB Circular A-102, and Executive Orders 11625, 12432 and 12138.

The Contractor and Loan Recipient shall at a minimum, take the following affirmative actions, known as "good faith efforts" in the procurement of subcontracts for construction, equipment, services, and supplies:

- i. Ensure DBE firms are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities and include small, minority and women's businesses on solicitation lists;
- ii. Assure that small, minority and women's businesses are solicited whenever they are potential sources;
- iii. Divide total requirements, when economically feasible, into small tasks or quantities to permit maximum participation by small, minority and women's businesses;
- iv. Establish delivery schedules, when the requirements of the work permit, which will encourage participation by small, minority and women's businesses;
- v. Use the services of the Small Business Administration and the Office of Minority Business Enterprise of the U.S. Department of Commerce, AHTD and AEDC as appropriate.
- vi. Continue the above steps, including follow-up contact as necessary, throughout the performance of the contract.

Prime Contractors must also follow the steps indicated below in the paragraph entitled "DBE/MBE/WBE Requirements Prior to Award" and all other instructions of this document.

DBE/MBE/WBE Requirements Prior to Award: All Bidders, as a condition of bidding, are required to document to the Owner and to the Commission that the "good faith efforts" were taken in the preparation of bids to obtain DBE/MBE/WBE participation. Contractors,

including DBE Prime Contractors, must conduct the “six good faith efforts” as well. Steps for Compliance are as follows:

- i. Solicit DBE/MBE/WBE quotes through direct solicitation communication, document that this was done, and submit within fifteen days of the bid opening. Examples of direct solicitation communication that must be conducted by the low bidder are: faxes, letters, phone calls, and emails. Indicate the source of the DBE/MBE/WBE list(s) used. Sources of DBE Certified Lists are listed below. Newspaper Advertisements/Public Notices alone will not meet the required DBE solicitation efforts.
- ii. Document efforts and responses received.
- iii. Document contracts awarded, or intent to award, and indicate whether the contract is with a DBE/MBE or WBE certified firm.
- iv. Document the basis on which the subcontractor/supplier was selected and/or rejected for all contracts awarded.

Note: Subcontracts include: supplies, services, equipment, and construction activity.

If the Primary Contractor states that they can complete the entire project using only in-house services and supplies, then the Contractor must indicate they will not use a subcontractor or procure supplies, services, and equipment on the DBE Compliance Evaluation Form and shall write a letter to that effect to Commission. Note, this occurs very infrequently.

Required Form: The DBE Compliance Evaluation Form Supplemental Conditions of the Revolving Loan Fund. (This form is numbered RLF-96 for CWRLF projects.) This form is to be completed and submitted within fifteen days of the bid opening.

Lists of DBE/MBE/WBE firms are available from:

- Arkansas Highway and Transportation Department, Programs and Contracts Division; 10324 I-30; Post Office Box 2261; Little Rock, Arkansas 72203, Phone: (501) 569-2259 www.ahtd.state.ar.us/contract/program/letting
- Arkansas Economic Development Commission, Small and Minority Business Team; One Capitol Mall; Little Rock, Arkansas 72201; Phone: (501) 682-6105 <http://www.arkansasedc.com>.
- Arkansas Small Business Administration, Business Opportunity Section; 2120 Riverfront Drive, Suite 100; Little Rock, Arkansas 72202-1747; Phone: (501) 324-7379; <http://pro-net.sba.gov/> or <http://www.ccr.gov>.

A copy of 40 CFR Part 33, Subpart C- Good Faith Efforts is attached to these Supplemental General Conditions.

DBE/MBE/WBE Reporting Requirements: In addition to the reporting and documentation requirements during bidding, the Contractor is required to report to the Owner within fifteen days of the end of each calendar quarter, or to the Division as requested, all contracts awarded to DBE/MBE/WBE firms throughout the life of the

contract. The Owner is required to report to the Division within thirty days of the end of each calendar quarter, all contracts awarded by the Owner and subcontracts awarded by the Owner's Contractors to DBE/MBE/WBE firms. In accordance with 40 CFR 35, Subpart K, the Division must report to the Environmental Protection Agency all DBE/MBE/WBE participation in the RLF program.

10. EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

- A. The Contractor will not discriminate against any employee or applicant for employment because of race, color, creed, sex, age, marital status, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, creed, sex, age, marital status, 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 apprenticeship. The Contractor agrees to furnish and post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this equal employment opportunity clause.
- B. The Contractor shall, in all solicitations or advertisements 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, creed, sex, age, marital status, or national origin.
- C. In the event of the Contractor's noncompliance with the equal employment opportunity clause of this contract or with any rules, regulations, or orders, this contract may be cancelled, terminated, or suspended in whole or in part.
- D. The Contractor shall include the provisions of subparagraph's (A) through (C) in every subcontract or purchase order involved with this contract.
- E. The Contractor or any Subcontractor shall have an affirmative action plan which declares that it does not discriminate on the basis of race, color, creed, national origin, sex, marital status, or age and which specifies goals and target dates to assure the implementation of that plan. The Owner shall establish procedures to assure compliance with this requirement by the Contractor and to assure that suspected or reported violations are promptly investigated.
- F. The Contractor and Subcontractors supplying materials, equipment and/or labor must comply with the Civil Rights Act of 1964 as amended (42 U.S.C. 2000d et seq.), Section 504 of the Rehabilitation Act of 1973 as amended (29 U.S.C. 794), Section 13 of the Federal Water Pollution Control Act Amendments of 1972 regarding sex discrimination (Public Law 92-500), and the Age Discrimination Act of 1973.

The Contractor and all Subcontractors shall provide equal employment opportunity for all qualified applicants and all contractor solicitations for employees must contain the Equal Employment Opportunity statement. The Prime Contractor must assure Subcontractor compliance with the Civil Rights Act for each subcontract by including the Act of

Assurance form and these Supplemental General Conditions in each Subcontract in excess of \$10,000. Applicable Equal Employment Opportunity regulations and Nondiscrimination provisions are described in the Appendix to these Supplemental General Conditions.

11. LABOR STANDARDS

The Contractor and all Subcontractors awarded subcontracts shall pay all laborers and mechanics employed on the project not less than the prevailing wage rates, as determined by the United States Secretary of Labor, in accordance with the Davis-Bacon Act as provided for in the Supplemental General Condition's Appendix A.

The wage decision identifies job classifications and minimum wages to be paid to all workers. Payrolls must be submitted weekly by the Contractor and all non-exempt Subcontractors to the Owner showing each worker's name, address, job classification, hourly rate of pay, daily regular and overtime hours, gross and net pay, and any fringe benefits where applicable. All workers are required to receive overtime pay in any week in which the hours worked exceed 40 hours per work week. Overtime is paid at a rate not less than 1 and 1/2 times the worker's base rate of pay.

The Owner is responsible for monitoring contractor compliance with Davis-Bacon Act requirements of Appendix A. The Owner's responsibilities will include, but not be limited to, payroll review for compliance, maintain payroll files, and conduct on-site interviews with the Contractor's employees to verify payroll accuracy. The Owner will provide the Commission a letter with each pay request certifying wages, through payroll review and employee interviews, met the Davis-Bacon Requirements of this contract. Copies of completed interviews will be forwarded to the Commission.

**12. RESPONSIBILITIES OF PARTICIPANTS REGARDING TRANSACTIONS
(A.K.A. DEBARMENT AND SUSPENSION)**

Individuals or organizations that have been debarred or excluded from participating in Federal Assistance programs under 40 CFR Part 32 are prohibited from participating in the RLF program. This prohibition applies for every contract and subcontract for materials, supplies, equipment, and services. Contractors and Subcontractors shall execute the Contractors Act of Assurance Form as provided in the Contract Documents certifying compliance with 40 CFR Part 32.

13. PROCUREMENT PROHIBITIONS

As required by Executive Order 11738, Section 306 of the Clean Air Act and Section 508 of the Clean Water Act, RLF loan recipients, Prime Contractors and Subcontractors are prohibited from procuring goods and services from persons who have been convicted of violations of either law if the goods or services are to be produced by the facility that gave rise to the violation.

14. SUBSTITUTIONS (of "or Equal")

All RLF procurement transactions shall be conducted in a manner that promotes maximum free and open competition. Whenever a material, article, or piece of equipment is identified

on the Drawings or Specifications by reference to brand name or catalogue numbers, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered for substitution. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.

15. INSURANCE

- A. The Contractor shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of, or result from, the Contractor's execution of the Work, whether such execution be by the Contractor, any Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
 - i. Claims under worker's compensation, disability benefit and other similar employee benefit acts;
 - ii. Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;
 - iii. Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;
 - iv. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person; and
 - v. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.
- B. Certificates of Insurance acceptable to the Owner and the Commission shall be filed with the Owner and the Commission prior to commencement of the Work. Each insurance policy shall contain a clause providing that it shall not be canceled by the insurance company without written notice to the Owner and the Commission of intention to cancel that is in accordance with Arkansas Code Annotated §23-66-206. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled unless at least fifteen days prior written notice has been given to the Owner and the Commission. The Insurance shall be made by an agent licensed by the Insurance Commissioner of the State of Arkansas to represent the surety company executing the bonds. Furthermore, the Commission will be a "Certificate Holder" and the words "will endeavor" must be removed from the insurance form.

- C. The Contractor shall procure and maintain, at the Contractor's own expense, during the Contract Time, liability insurance as hereinafter specified:

Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Contractor and protecting the Contractor from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the Contract Documents, whether such operations be by the Contractor or by any Subcontractor employed by the Contractor or anyone directly or indirectly employed by the Contractor or by a Subcontractor employed by the Contractor. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom sustained by any one person in any one accident; and a limit of liability of not less than \$2,000,000 aggregate for any such damage sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 aggregate for any such damage sustained by two or more persons in any one accident.

- D. The Contractor shall furnish umbrella liability coverage, and keep it in effect during the term of the contract which provides excess limits over the primary coverages. The minimal amount of coverage will be determined by the Risk Management Division of the Arkansas Insurance Department.
- E. The Contractor shall procure and maintain, at the Contractor's own expense, during the Contract Time, in accordance with the provisions of the laws of the State in which the Work is performed, Worker's Compensation Insurance, including occupational disease provisions, for all of the Contractor's employees at the site of the Project and in case any Work is sublet, the Contractor shall require such Subcontractor similarly to provide Worker's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the Project is not protected under Worker's Compensation statute, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.
- F. The Contractor shall secure, if applicable, "All Risk" type Builder's Risk Insurance for Work to be performed. Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the Contract Price totaled in the Bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightening, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the Contract Time, and until the Work is accepted by the Owner. The policy shall name as the insured the Contractor, and the Owner.

16. CONTRACT SECURITY

- A. The Contractor shall within ten days after the receipt of the Notice of Award furnish the Owner and the Commission with a Performance Bond and a Payment Bond in penal sums

equal to the amount of the Contract Price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the State in which the Work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570, provided that the contract amount shall not exceed the underwriting limitation listed for the surety in Circular 570. For contracts in excess of \$100,000.00, the Bonds shall be issued by a Bonding Company by the A.M. BEST Rating Book as follows:

- i. contracts in excess of \$100,000.00, but less than \$1,000,000.00 - "B+" rating or higher and contract amount may not exceed 2.0% of the policyholder's surplus.
- ii. contracts in excess of \$1,000,000.00 - "A" rating or higher and contracts may not exceed 2.0% of the policyholder's surplus.

- B. In addition, the Bonds shall be executed by an Agent licensed by the Insurance Commissioner of the State of Arkansas to represent the surety company executing the bonds. The mere countersigning of a bond will not be sufficient. The Agent shall file with the bonds its Power of Attorney. The expense of these Bonds shall be borne by the Contractor. If at any time a surety on any such Bond is declared bankrupt or loses its right to do business in the State of Arkansas or is removed from the above list of Surety Companies, the Contractor shall notify the Owner, Engineer, and the Commission and substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner and Commission. The Contractor shall pay the premiums on such Bond. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the Owner and the Commission

17. ASSIGNMENTS

The Contractor shall not sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of any right, title or interest therein, or any obligations thereunder, without written consent of the Owner.

18. INDEMNIFICATION

- A. The Contractor will indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims; damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
- B. In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or

indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefits acts or other employee benefits acts.

- C. The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, its agents or employees arising out of the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications.

19. SEPARATE CONTRACTS

- A. The Owner reserves the right to let other contracts in connection with this Project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate the Work with theirs. If the proper execution or results of any part of the Contractor's Work depends upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such Work that render it unsuitable for such proper execution and results.
- B. The Owner may perform additional Work related to the Project or the Owner may let other contracts containing provisions similar to these. The Contractor will afford the other Contractors who are parties to such contracts (or the Owner, if the Owner is performing the additional Work) reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate the Work with theirs.
- C. If the performance of additional Work by other Contractors or the Owner is not noted in the Contract Documents prior to the execution of the Contract, written notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the Owner or others involves it in additional expense or entitles it to an extension of the Contract Time, the Contractor may make a claim thereof as provided in Sections 15 and 16.

20. SUBCONTRACTING

- A. The Contractor may utilize the services of specialty Subcontracts on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors.
- B. The Contractor shall not award Work to Subcontractor(s), in excess of fifty percent of the Contract Price, without prior written approval of the Owner.
- C. The Contractor shall be fully responsible to the Owner for the acts and omissions of its Subcontractors, and of persons either directly or indirectly employed by them, as the Contractor is for the acts and omissions of persons directly employed by the Contractor.

- D. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the Work of Subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.
- E. Nothing contained in this Contract shall create any contractual relationship between any Subcontractor and the Owner.

21. PRE-CONSTRUCTION CONFERENCE

A Pre-Construction Conference (PCC) will be held following the RLF loan closing, the review of bid documents by the Commission, and the Award of the construction contract(s). Work orders will not be issued until after the PCC is held and the Contractor has furnished an acceptable completion schedule as described by these Supplemental General Conditions. The PCC shall be attended by the Owner, Engineer, Contractor(s), and representatives of the Commission. The purpose of the conference will be to define the roles and responsibilities of the Owner, the Commission, the Engineer and all Contractors during the performance of the Contract.

22. SCHEDULES, REPORTS AND RECORDS

- A. The Contractor shall submit to the Owner and the Engineer such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be performed. One copy of the up-to-date schedule shall be maintained at the job site.
- B. Prior to the first partial payment estimate, the Contractor shall submit construction progress schedules showing the order in which the Contractor proposes to carry on the Work, including dates at which the various parts of the Work will be started, estimated date of completion of each part and, as applicable:
 - i. The dates at which special detailed drawings will be required; and
 - ii. Respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.
- C. The Contractor shall also submit a schedule of payments that the Contractor anticipates will be earned during the course of the Work that must be updated each month.

23. JOB BULLETIN BOARD

The Contractor shall maintain a weather-tight job bulletin board in an area frequented by the Contractor's employees for the duration of construction. The job bulletin board shall display at a minimum a copy of the Davis-Bacon Wage Decision, a Davis-Bacon poster, a notice to employees concerning minimum wage requirements, Equal Employment Opportunity (Labor Standards) information, and a notice to labor unions as applicable. A copy of the construction schedule (i.e. critical path chart) is to be placed on the job bulletin board and updated monthly, showing project progress.

24. SHOP DRAWINGS

- A. The Contractor shall provide Shop Drawings as may be necessary for the prosecution of the Work as required by the Contract Documents. The Engineer shall promptly review all Shop Drawings. The Engineer's approval of any Shop Drawings shall not release the Contractor from responsibility for deviations from the Contract Documents. The approval of any Shop Drawings, which substantially deviates from the requirement of the Contract Documents, shall be evidenced by a Change Order.
- B. When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that he has reviewed, checked and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.
- C. Portions of the Work requiring Shop Drawings or submission of samples shall not begin until the Shop Drawings or submissions have been approved by the Engineer. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

25. MATERIALS, SERVICES AND FACILITIES

- A. It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, lights, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete and deliver the Work within the specified time.
- B. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection. Materials not located in or near the project site will not be eligible for re-imburement.
- C. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the Manufacturer.
- D. Materials, supplies, and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.
- E. Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the Seller.

26. SAFETY STANDARDS

- A. The Contractor is responsible for complying with the Department of Labor Safety and Health Regulations promulgated under Section 107 of the Contract Work Hours and Safety Standard Act (40 U.S.C. 327-333). The Contractor shall not require any laborer or mechanic employed in the performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health or safety,

as determined under construction safety and health standards promulgated by regulations of the Secretary of Labor.

Job site situations which pose an immediate and serious threat to life or safety will be referred to the Occupational Safety and Health Administration (OSHA).

- B. Act 291 of the 1993 Arkansas General Assembly applies to all public improvement construction projects that involve any trench or excavation which equals or exceeds five feet in depth. Beginning March 1, 1993, Act 291 requires that:
- i. The current edition of Occupational Safety and Health Administration Standard for Excavation and Trenches Safety System, 29 CFR 1926, Subpart P, be specifically incorporated into the specifications for the project; and
 - ii. The contract bid form include a separate pay item for trench and excavation safety systems and be included in the base bid.

In the event that a Contractor fails to complete a separate pay item in accordance with the Act, the Owner shall declare that the bid fails to comply fully with the specifications and the bid will be considered invalid as a non-responsive bid.

The Owner shall notify the Safety Commission of the State Department of Labor of the award of a contract covered by this Act.

27. PROTECTION OF LIVES AND PROPERTY

- A. In order to protect the lives and health of its employees under the contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment or work under the contract.
- B. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances and methods and for any damage which may result from his failure or his improper construction, maintenance or operation.

28. PROTECTION OF WORK, PROPERTY, AND PERSONS

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

- B. The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. The Contractor will notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Owner, of the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.
- C. In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instructions or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. The Contractor will give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

29. PROTECTION OF THE ENVIRONMENT

The Contractor will provide for protection of the environment as required by the Contract Documents, Local Ordinance, State and Federal Law and these Supplemental General Conditions. The Contractor shall:

- i. Limit the area of construction disturbance to areas within temporary and permanent easements and the land areas designated for the Contractors use in performing the work.
- ii. Provide for the protection of trees, shrubs and grass wherever possible.
- iii. Provide for the prevention of air pollution through burning permits as required. The Contractor shall provide dust control on haul roads as site conditions dictate.
- iv. Control noise pollution by providing efficient mufflers on all machinery and limiting work hours if required by the Contract Documents.
- v. Control excessive erosion and sedimentation at the job site through prompt seeding of disturbed areas and the construction of temporary control measures as required in the contract documents and by Storm Water Permits.
- vi. Perform the work in coordination with the Owner and in a manner that will provide for the continuous transport and treatment of wastewater during construction.
- vii. Cease all work in areas where species classified as threatened or endangered under the Endangered Species Act (Public Law 93-205 as amended) are discovered and promptly notify the Engineer.

30. ARCHAEOLOGICAL, HISTORICAL, AND CULTURAL REMAINS

The Contractor shall immediately stop all work in any area where artifacts of archaeological, historical or cultural significance are found and notify the Engineer. The Owner shall notify the Commission, the State Advisory Council on Historic Preservation and the Arkansas Natural Heritage Commission of the discovery.

31. STORM WATER PERMIT REQUIREMENTS

- A. The Contractor is advised that if this construction activity involves clearing, grading or excavation activities that result in the disturbance of one or more acres of total land area including areas which are part of the total RLF project, this activity is subject to Storm Water Permit Requirements of the Arkansas Department of Environmental Quality. The Owner will obtain an NPDES General Stormwater Permit for construction activities (ARR150000). The Contractor is responsible for compliance with all terms and conditions of the General Permit. Most RLF projects are eligible for inclusion under the General Permit.
- B. The General Permit requires the control of the entrance of pollutants into the surface and ground waters of the State. Temporary and permanent sediment and erosion control measures must be included in the Work during the course of construction. These measures may include temporary and permanent seeding, construction of catch basins, the use of mulch, straw bales and silt fences to control sediments, the use of riprap at erosion-prone areas, and other measures.
- C. The General Permit also requires maintenance and “good housekeeping practices” that include items such as proper waste disposal, proper storage for hazardous materials and designating safe places for equipment maintenance and wash-down.
- D. The Contractor is required to maintain on-site a Stormwater Pollution Prevention Plan describing the storm water pollution prevention measures that will be taken at the construction site. The Plan must include a site description, a description of the nature of the activity, the intended sequence of the work, estimates of the total area involved in the activity, an estimate of the possible volume of runoff from the area, site maps showing drainage patterns, pollution prevention measures that will be taken, and other items.
- E. The Contractor is responsible for implementation of Best Management Practices described within the Stormwater Pollution Prevention Plan.
- F. The Contractor shall be responsible for implementing all applicable requirements of the Owner’s ADEQ General Stormwater Permit for Construction Activity, 401 Water Quality Certification, the COE Section 404 Permit, the ADEQ Short-Term Activity Authorization, the SPCCP, the USFWS recommendations for cave protection, local Municipal Separate Storm Sewer requirements, and all other environmental regulatory requirements that are associated with the construction activities that the Contractor is to perform.
- G. Additional information and application materials may be obtained by writing to the Arkansas Department of Environmental Quality’s Storm Water Permits Section.

32. ENGINEER'S AUTHORITY

- A. The Engineer shall act as the Owner's representative during the construction period, shall decide questions which may arise as to quality and acceptability of materials furnished and Work performed, and shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.
- B. The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship, and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply.
- C. The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- D. The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.

33. OWNER'S PROTECTION FROM CONTRACTOR'S ACTIONS

The Engineer may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the owner from loss on account of:

- i. Defective work not remedied.
- ii. Claims filed or reasonable evidence indicating probable filing of claims.
- iii. Failure of Contractor to make payments properly to Subcontractors or for material or labor.
- iv. A reasonable doubt that the work can be completed for the balance then unpaid.
- v. Damage to another Contractor.
- vi. Performance of work in violation of the terms of the contract documents.

34. INSPECTION AND TESTING

- A. All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.
- B. The Owner shall provide for full time inspection of the work by the Engineer to assure the work is being performed in accordance with the approved plans, specifications and change orders; and in accordance with sound engineering principles and building practices.

The Resident Inspector(s) of the Owner will perform required inspections and tests and maintain on-site records as assurance that the work conforms to the contract requirements. The Resident Inspector shall make available to the Owner and Commission representatives adequate records of such inspections and tests. Failed tests with passing retests will be clearly marked in the project records.

- C. The Contractor will maintain an adequate inspection and supervision system and perform required inspections and tests to assure that the work conforms to the contract requirements. The Contractor will make available to the Owner and the Commission adequate records of such inspections and tests. Failed tests with passing re-tests will be clearly marked in the project records.
- D. If laws, ordinances, or regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested, or approved by an employee or other representative of such public body, the Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish the Engineer the required certificates of inspection or approval.
- E. Inspections, tests, or approvals by the Engineer or others shall not relieve the Contractor from the obligations to perform the Work in accordance with the requirements of the Contract Documents and Specifications.
- F. The Engineer and the Engineer's representatives will at all times have access to the Work. In addition, authorized representatives and agents of any participating State agency shall be permitted to inspect all work, materials, payrolls, records or personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.
- G. The Commission will make periodic engineering and administrative inspections of the project to examine project records, monitor progress and inspect the work for conformance with contract requirements. The Commission shall notify the Owner and the Engineer of any observed deficiencies in the completed construction, procedures or materials used in construction, resident inspection, engineering supervision, financial management or any violation of loan program requirements. The Commission will require the Owner to take such action as may be necessary to correct any such observed deficiency.
- H. If any Work is covered contrary to the written instructions of the Engineer it must, if requested by the Engineer, be uncovered for the Engineer's observation and replaced at the Contractor's expense.
- I. If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, if however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

- J. The Contractor shall maintain books, records, documents and other evidence directly pertinent to performance on RLF funded work under this agreement in accordance with the provisions of these Contract Documents. The Contractor shall also maintain the financial information and data used in the preparation or support of the cost submission required for a change order and a copy of the cost summary submitted to the Owner. The Owner and the Commission or any of their authorized representatives shall have access to all such books, records, documents and other evidence for the purpose of inspection, audit and copying during normal business hours. The Contractor will provide proper facilities for such access and inspection.
- K. Upon completion of all project construction, the Commission will schedule a final inspection within thirty days of receipt of a written certification by the Owner that construction is ready for a final inspection. Prior to approval of the final construction payment, the Commission will verify that all construction is complete in accordance with plans, specifications and approved change orders, all equipment has been purchased and installed, the final contract amounts have been agreed to by Change Order, as-built drawings are complete, and the Owner has prepared an operation and maintenance manual that includes contractor supplied data as required by these Supplemental General Conditions.

Following an acceptable Final Inspection by the Commission, the Commission will provide written acceptance to the Owner of the project and the final construction payment can be requested. The Commission will not approve the final construction payment until the Owner and the Contractor has complied with the requirement for the release of final payment as outlined in these Supplemental General Conditions.

35. SUPERVISION BY CONTRACTOR

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

36. PAYMENT TO CONTRACTOR

- A. Disbursements from the State Revolving Loan Fund (RLF) Programs shall be made monthly based upon actual work performed and materials stored on site less retainage. Funds will not be disbursed from the RLF without approval by the Commission. The Commission will approve disbursements provided the Owner (loan recipient) and the Contractor are in compliance with the provisions of these contract documents and RLF regulations. Contract cost overruns approved by the Commission but in excess of the loan amount must be funded by the Owner or through an additional loan. Contract cost overruns not approved by the Commission must be funded by the Owner.

- B. Each month, at least ten days before each progress payment falls due (but not more often than once a month), the Contractor shall prepare and submit to the Engineer a progress estimate acceptable in form and content to the Engineer and the Commission supported by such data as the Engineer may reasonably require. The estimate shall show a detailed breakdown of the amount of work completed previously, amount of work completed this period, amount of work completed to date, the amount of retainage, and the quantity and value of materials and equipment currently stored on site that have not been incorporated into the work. Partial payment requests will be placed on the form provided by the Commission and must include a reduced scale copy of the updated construction schedule. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner as will establish Owner's title to the material and equipment and protect the Owner's interest therein, including applicable insurance.

The progress payment request shall also include a certification by the Contractor that it has complied with all labor standards. The Certification may be placed in the content of the progress payment request or Commission form "Certification by Contractor of Labor Standards Compliance" may be attached to the payment request. No disbursement request will be approved by the Commission without this certification. Furthermore, the Owner will provide the Commission a letter with each pay request certifying wages, through payroll review and employee interviews, met the Davis-Bacon Requirements of this contract. Copies of completed interviews will be forwarded to the Commission.

The Engineer will, within ten days after receipt of each partial payment estimate, either indicate in writing approval of payment, and present the partial payment estimate to the Owner or return the partial payment estimate to the Contractor indicating in writing the reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within ten days of presentation of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate less the retainage.

Retainage will be in accordance with state law (Arkansas Code of 1987 as amended, Annotated 22-9-604) and as described herein. The retainage shall be an amount equal to five percent of said estimate (excluding Section C. below). Upon final completion of the work, any amount retained may be paid to the Contractor. When the Work has been completed except for Work which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgement of the Owner are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the Work still to be completed.

- C. In compliance with Arkansas Code Ann. §17-25-404 (1995), ten percent may be withheld from the Engineer's estimate until a proper statement or certificate is received from the Contractors Licensing Board stating that the required bond has been filed and that the Contractor is otherwise in compliance with Arkansas Code Ann. §17-25-404 (1995).
- i. That no compensating tax is due the State under the contract.

- ii. That the tax due under the contract has been paid.
 - iii. That a suitable surety bond has been provided by the Contractor and approved by the Contractors Licensing Board as prescribed in the Act.
- D. The Owner shall request payment on Disbursement Request Form supplied during the Pre-Construction Conference. The requested amount shall not exceed the current amounts approved for construction, engineering and other project costs on individual line items. Only those individuals authorized to represent the Owner and the Engineer shall sign the Disbursement Request Form. Documentation for costs incurred since the last disbursement request must accompany each pay request including the Contractor's monthly pay estimate with attachments as described in these Supplemental General Conditions and invoices for engineering, administrative, and legal services as well as approved equipment costs.
- E. The Owner is required to submit one copy of the completed Disbursement Request Form and all supporting documentation to the Commission for processing; the deadlines for all disbursements from the City to the Commission will be discussed at the Preconstruction Conference. Disbursement requests not received at the Commission prior to the deadlines established in the Preconstruction Conference will not be processed and paid until the following month.
- For the Owner to realize this deadline, Contractor estimates should be received by the Engineer on or before the 10th day of each month. The actual due date for Contractor estimates shall be as established by the Contract Documents or by the Engineer.
- F. Disbursements from the RLF are generally received by the Owner (loan recipient) from the Arkansas Development Finance Authority (ADFA) within the first ten working days of the month. The Owner shall promptly pay all bills due as disbursements are made from the RLF.
- G. Prior to Substantial Completion, the Owner with the approval of the Engineer and with the concurrence of the Contractor, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.
- H. The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the Owner.
- I. Upon completion and acceptance of the Work, the Engineer shall issue a certificate attached to the final payment request that the Work has been accepted under the conditions of the Contract Documents. The entire balance found to be due the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the Owner shall be paid to the Contractor within thirty days of completion and acceptance of the Work.

- J. The Contractor will indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demand of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Owner may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor, the Contractor's Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.
- K. If the Owner fails to make payment thirty days after approval by the Engineer, in addition to other remedies available to the Contractor, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.
- L. In addition to the Contract Time specified in these Contract Documents, the Bond Purchase Agreement between the Owner and the Commission contains an estimated completion date beyond which no further loan disbursements will be made without specific written waiver by ADFA and the Commission. ADFA and the Commission will grant waivers only where there is sufficient documented evidence that project completion was delayed through no fault of the Contractor and the Owner.

Regardless of the existence of circumstances where a delay in completion is beyond the control of the Contractor and the Owner, a waiver to the estimated completion date will not be granted should the granting of such waiver harm any commitments made to the purchasers of Revolving Loan Fund Bonds issued by ADFA. Should a waiver be denied, the Owner must complete the project with its own funds or apply for an additional loan from the RLF program.

37. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance of the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the Owner and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or its sureties from any obligations under the Contract Documents or the Performance and Payment Bonds.

38. CLEANUP AND CORRECTIONS

Where work on unit price items are substantially complete but lack clean-up and/or corrections ordered by the Engineer, amounts shall be deducted from unit prices in partial payment estimates to amply cover such clean-up and corrections.

39. TAXES

The Contractor will pay all sales, consumer, use and other similar taxes required by the laws of the place where the Work is performed.

40. STATE TAX EXEMPTION

This section only applies with projects receiving Clean Water Revolving Loan Funds; Drinking Water Revolving Loan Funds can not receive this benefit. Except where applicable below, the Contractor will pay all sales, consumer, use and other similar taxes required by the laws of the place where the Work is performed. Machinery and equipment purchased by the Contractor for installation under this contract may be exempt from Arkansas Sales Tax. Arkansas Department of Finance and Administration Regulation GR-66 states that the gross proceeds derived from the sale of pollution control machinery and equipment are exempt from the tax if:

- i. The machinery and equipment is utilized, either directly or indirectly, by manufacturing or processing plants or facilities, or cities or towns in Arkansas to prevent or reduce air or water pollution or contamination which might otherwise result from the operation of the plant or facility; and,
- ii. The machinery and equipment is required by Arkansas or federal law or regulations to be installed and utilized to control pollution or contamination as evidenced by written documentation from the Arkansas Natural Resources Commission or the Environmental Protection Agency.
- iii. Supplies and chemicals used by pollution control machinery and equipment are taxable.

Should the contract involve the installation of pollution control machinery and equipment at a treatment facility, the Arkansas Department of Environmental Quality will furnish a written general certification to document that the machinery and equipment is required by Arkansas or federal law. A request for written documentation should be sent to the Arkansas Department of Environmental Quality's NPDES Permit Branch, Water Division.

To claim the exemption, the Contractor must provide the vendor with a copy of the documentation. The invoice must show that the purchase is for pollution control machinery and equipment under Arkansas Code Annotated 26-53-114. Most ancillary items necessary to install the equipment do not qualify for tax exemption. Any questions involving the definition of machinery and equipment should be directed to the Arkansas Department of Finance and Administration's Sales and Use Tax Section.

41. OPERATION AND MAINTENANCE MANUAL

- A. The Contractor shall furnish four copies of all operation, maintenance, repair and replacement manuals, and product data for all equipment supplied by the Contractor to the Engineer. The Engineer shall not certify payments requesting more than eighty percent of the Contract amount until such time as all operation, maintenance, repair and replacement manuals, and product data has been furnished by the Contractor to the Engineer.
- B. The Engineer is required to obtain approval from the Commission of the project operation and maintenance manual prior to the release of the final construction payment.

42. CHANGES IN THE WORK

- A. The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.
- B. All changes should be recorded and approved on a contract Change Order so that they may be included in partial payment estimates. The Commission must approve all contract Change Orders prior to commencing with the associated Work. When drafting Change Orders, the Engineer will use the RLF form provided by the Commission.
- C. All changes, which affect the cost of the construction of the Project, must be authorized by means of a contract Change Order. The contract Change Order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements.

In the case of defective specifications for which the Owner is responsible, the equitable adjustment shall include any increased cost the Contractor reasonably incurred in attempting to comply with those defective specifications.

Where justified, adjustments to the Contract Time specified in the Contract Documents shall be made in conjunction with changes in the work and with equitable adjustments in the contract price as described in these Supplemental General Conditions. Where delays in project completion are not due to changes in the work or acts of the Owner, extensions to the contract time will be made only where there is sufficient documented evidence that delays in project completion were caused by events beyond the contractor's control.

The Owner shall promptly investigate the conditions and if found that conditions materially differ, the Owner will cause an increase or decrease in the Contractor's cost or the time required to perform any part of the work under this agreement as applicable.

The Contractor shall promptly, and before such conditions are disturbed, notify the Owner in when differing site conditions occur. Notification will come in the writing with:

- i. Subsurface or latent physical conditions at the site differing materially from those indicated in this agreement, or

- ii. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this agreement.

No claim of the Contractor for increased cost or time due to differing site conditions shall be allowed unless the Contractor has given a written notice of the differing site conditions within thirty days of the discovery of such conditions.

- D. The Contractor shall document the necessity of all claims for additional cost and time in writing and shall provide detailed cost and time estimates to the Engineer for all proposed contract changes. The Engineer shall review the supporting documents and estimates provided by the Contractor for reasonableness and shall as necessary develop independent cost estimates of the proposed contract changes to assure that the cost of the proposed change is fair and reasonable.
 - E. The Owner shall provide sufficient information such as a description and justification for the change, drawings, the Contractor's proposal and other supporting documentation to the Commission for review. The Owner shall promptly notify the Commission in writing of events or proposed changes which may substantially alter the design and scope of the Project, alter the type of treatment provided or the location, size, capacity, or quality of any major item of equipment or treatment unit, or exceed the amount of funds available to complete the project.
 - F. The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be determined by one or more of the following methods in the order of precedence listed below:
 - i. Unit prices previously approved.
 - ii. An agreed lump sum.
 - G. Should project changes increase the amount of funds necessary to complete the Project beyond the initial loan amount, the Owner must fund the project changes or apply to the Commission for monies to cover the cost overruns.
 - H. The Engineer, also, may at any time, by issuing a Field Order, make changes in the details of the Work. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer unless the Contractor believes that such Field Order entitles the Contractor to change in Contract Price or Time, or both, in which event the Contractor shall give the Engineer written notice thereof within seven days after the receipt of the ordered change. Thereafter the Contractor shall document the basis for the change in Contract Price or Time within thirty days. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the Owner.
- 43. SUBSURFACE CONDITIONS**
- A. The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by Written Notice of:

- i. Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or
 - ii. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.
- B. The Owner shall promptly investigate the conditions, and if it is found that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless the required Written Notice has been given; provided that the Owner may, if the Owner determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

44. CORRECTION OF WORK

- A. The Contractor shall promptly remove from the premises all Work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all Work of other Contractors destroyed or damaged by such removal or replacement.
- B. All removal and replacement Work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected Work within ten days after receipt of Written Notice, the Owner may remove such Work and store the materials at the expense of the Contractor.

45. SURVEYS, PERMITS, REGULATIONS

- A. The Owner, through the Engineer, shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the Work together with a suitable number of bench marks adjacent to the Work as shown in the Contract Documents. From the information provided by the Engineer unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.
- B. The Contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.
- C. Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and

specified. If the Contractor observes that the Contract Documents are at variance therewith, the Contractor shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 42, CHANGES IN THE WORK.

46. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- A. The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed.
- B. The Contractor will proceed with the Work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work.
- C. If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Bid for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.
- D. The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to the following and the Contractor has promptly given Written Notice of such delay to the Owner or Engineer.
 - i. To any preference, priority or allocation order duly issued by the Owner.
 - ii. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
 - iii. To any delays of Subcontractors occasioned by any of the causes specified in paragraphs (i.) and (ii) of this article.
- E. Where justified, adjustments to the Contract Time specified in the Contract Documents shall be made in conjunction with changes in the work and with equitable adjustments in the contract price as described in these Supplemental General Conditions. Where delays in project completion are not due to changes in the work or acts of the Owner, extensions to the contract time will be made only where there is sufficient documented evidence that delays in project completion were caused by events beyond the Contractor's control. Requests for time extensions by the Contractor must be submitted with the pay estimate for the month that the lost days are being sought.
- F. Notification procedures.
 - i. At eighty percent completion of project construction time the Engineer will contact in writing the Surety Company, the Contractor, the Owner, and the Funding Agencies. The letter will contain contract specific language concerning time left in the contract and work needed to be completed. If the Engineer deems the project to be on time for

completion then they may contact the Owner and the Funding Agency via email requesting a relief from this clause.

- ii. When contract time has been completed and the project is not substantially complete, the Engineer will notify in writing the Surety Company, the Contractor, the Owner, and the Funding Agencies. The letter will notify all parties that Liquidated Damages will be assessed from this point forward until the project has been completed.
- iii. If paragraph ii. above is enacted, the Engineer will contact all parties in writing when the project is complete.

47. SUSPENSION OF WORK, TERMINATION, AND DELAY

- A. The Owner may suspend the Work or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor and the Engineer, which shall fix the date on which Work shall be resumed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.
- B. If the Contractor is adjudged to be bankrupt or insolvent, or makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of its property, or if the Contractor files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or repeatedly fails to make prompt payments to Subcontractors or for labor, materials, or equipment or disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the Work or disregards the authority of the Engineer, or otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and its surety a minimum of ten days from delivery of a Written Notice, terminate the services of the Contractor and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the Work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the Owner. Such costs incurred by the Owner will be determined by the Engineer and incorporated in a Change Order.
- C. Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any right of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents. Upon receipt of a termination action the Contractor shall promptly discontinue all affected work (unless the notice directs otherwise), and deliver or otherwise make available to the Owner all data, drawings, specifications, reports, estimates, summaries and such other information and materials as may have been accumulated by the Contractor in performing this agreement, whether completed or in process.

- D. After ten days from delivery of a Written Notice to the Contractor and the Engineer, the Owner may, without cause and with prejudice to any other right or remedy, elect to abandon the Project and terminate the Contract. In such case the Contractor shall be paid for all Work executed and any expense sustained plus reasonable profit.
- E. If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety days by the Owner or under an order of the court or other public authority, or the Engineer fails to act on any request for payment within thirty days after it is submitted, or the Owner fails to pay the Contractor substantially the sum approved by the Engineer or awarded by arbitrators within thirty days of its approval and presentation, then the Contractor may, after ten days from delivery of a Written Notice to the Owner and the Engineer terminate the Contract and recover from the Owner payment for all Work executed and all expenses sustained. In addition and in lieu of terminating the Contract, if the Engineer has failed to act on a request for payment or if the Owner has failed to make any payment as aforesaid, the Contractor may upon ten days written notice to the Owner and the Engineer stop the Work until paid all amounts then due, in which event and upon resumption of the Work Change Orders shall be issued for adjusting the Contract Price or extending the Contract Time or both to compensate for the costs and delays attributable to the stoppage of the Work.
- F. If the performance of all or any portion of the Work is suspended, delayed, or interrupted as a result of a failure of the Owner or Engineer to act within the time specified in the Contract Documents, or if no time is specified, within a reasonable time, an adjustment in the Contract Price or an extension of the Contract Time, or both, shall be made by Change Order to compensate the Contractor for the costs and delays necessarily caused by the failure of the Owner or Engineer.

48. AS-BUILT DRAWINGS

To assure quality control, the Contractor and the Owner's Inspector shall each maintain a complete set of Plans and Specifications and approved shop drawings at the construction site. In addition, one set of Plans shall be maintained at the site solely for the purpose of marking authorized changes in the plans as the work progresses. These marked up drawings shall be used in the preparation of as-built drawings following project completion and shall be maintained in current condition at all times.

49. GUARANTEE

The Contractor shall guarantee all materials and equipment furnished and Work performed for a period of one year from the date of Substantial Completion. The Contractor warrants and guarantees for a period of one year from the date of Substantial Completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other Work that may be made necessary by such defects, the Owner

may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

50. PATENTS

The Contractor shall pay all applicable royalties and license fees, and shall defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer or manufacturers is specified, however, if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, the Contractor shall be responsible for such loss unless the Contractor promptly gives such information to the Engineer.

51. CONFLICTS OF INTEREST

No official of the Owner who is authorized in such capacity and on behalf of the "Owner" to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof. No officer, employee, architect, attorney, engineer or inspector of or for the "Owner" who is authorized in such capacity and on behalf of the "Owner" who is in any legislative, executive, supervisory, or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

52. ARBITRATION BY MUTUAL AGREEMENT

- A. All claims, disputes, and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, except for claims which have been waived by making an acceptance of final payment as provided by Section 36 and 37, may be decided by arbitration if the parties mutually agree. Any agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.
- B. Notice of the request for arbitration shall be filed in writing with the other party to the Contract Documents and a copy shall be filed with the Engineer. Request for arbitration shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable statute of limitations.
- C. The Contractor shall diligently pursue the completion of the work during any arbitration or court proceeding unless the work is suspended by the Owner or the contract terminated under the provisions of the Contract Documents.

53. GRATUITIES

If the Owner finds after a notice and hearing that the Contractor or any of the Contractor's agents or representatives offered or gave gratuities (in the form of entertainment, gifts or otherwise) to any official, employee or agent of the Owner, or the State, in an attempt to

secure an agreement or favorable treatment in awarding, amending or making any determinations related to the performance of this agreement, the Owner may, by written notice to the Contractor, terminate this agreement. The Owner may also pursue other rights and remedies that the law or this agreement provides. However, the existence of the facts on which the Owner bases such findings shall be at issue and may be reviewed in proceedings under the Disputes and Remedies section of these Supplemental General Conditions.

54. PROHIBITION ON CERTAIN TELECOMMUNICATION AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

The Contractor and all subcontractors awarded subcontracts must comply with regulations at 2 CFR 200.216, *Prohibition on certain telecommunication and video surveillance services or equipment*, implementing section 889 of Public Law 115-232. The regulation prohibits the use of federal funds to procure, enter into, extend, or renew contracts, or obtain equipment, systems, or services that use “covered telecommunications equipment or services” identified in the regulation as a substantial or essential component of any system, or as critical technology as part of any system. The Contractor hereby represents and warrants to and for the benefit of the Owner and the Commission that: (a) the Contractor has reviewed and understands the prohibition on certain telecommunication and video surveillance services, or equipment (the “Prohibition Requirement”) and (b) the Contractor will provide verified information, certification or assurance of compliance with this paragraph, or information necessary to support the Prohibition Requirement. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Owner or Commission to recover as damages against the Contractor for any loss, expense, or cost including, without limitation, attorney’s fees, incurred by the Owner or Commission resulting from any such failure including, without limitation, any impairment or loss of funding, whether in whole or in part, from the Commission or any damages owed to the Commission by the Owner. While the Contractor has no direct contractual privity with the Commission, the Owner and the Contractor agree that the Commission 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 Commission. A copy of the EPA Memorandum implementing the Prohibition Requirement is attached as Appendix E to these Supplemental General Conditions.

Appendix A.

United States Environmental Protection Agency
Washington, DC 20460

Labor Standards Provisions for
Federally Assisted Contracts

Davis-Bacon and Related Acts

ATTACHMENT 1

CWSRF: The recipient agrees to include in all agreements to provide assistance for the construction of treatment works carried out in whole or in part with such assistance made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.), or with such assistance made available under section 205(m) of that Act (33 U.S.C. 1285(m)), or both, a term and condition requiring compliance with the requirements of section 513 of that Act (33 U.S.C. 1372) in all procurement contracts and sub-grants, and require that loan recipients, procurement contractors and sub-grantees include such a term and condition in subcontracts and other lower tiered transactions. All contracts and subcontracts for the construction of treatment works carried out in whole or in part with assistance made available as stated herein shall insert in full in any contract in excess of \$2,000 the contract clauses as attached hereto entitled "Wage Rate Requirements Under The Consolidated and Further Continuing Appropriations Act, 2013 (P.L. 113-6)." This term and condition applies to all agreements to provide assistance under the authorities referenced herein, whether in the form of a loan, bond purchase, grant, or any other vehicle to provide financing for a project, where such agreements are executed on or after October 30, 2009.

DWSRF: The recipient agrees to include in all agreements to provide assistance for any construction project carried out in whole or in part with such assistance made available by a drinking water revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12), a term and condition requiring compliance with the requirements of section 1450(e) of the Safe Drinking Water Act (42 U.S.C. 300j-9(e)) in all procurement contracts and sub-grants, and require that loan recipients, procurement contractors and sub-grantees include such a term and condition in subcontracts and other lower tiered transactions. All contracts and subcontracts for any construction project carried out in whole or in part with assistance made available as stated herein shall insert in full in any contract in excess of \$2,000 the contract clauses as attached hereto entitled "Wage Rate Requirements Under The Consolidated and Further Continuing Appropriations Act, 2013 (P.L. 113-6)." This term and condition applies to all agreements to provide assistance under the authorities referenced herein, whether in the form of a loan, bond purchase, grant, or any other vehicle to provide financing for a project, where such agreements are executed on or after October 30, 2009.

ATTACHMENT 2

Wage Rate Requirements

Under The Consolidated and Further Continuing Appropriations Act, 2013 (P.L. 113-6)

With respect to the Clean Water and Safe Drinking Water State Revolving Funds, EPA provides capitalization grants to each State which in turn provides subgrants or loans to eligible entities within the State. Typically, the subrecipients are municipal or other local governmental entities that manage the funds. For these types of recipients, the provisions set forth under Roman Numeral I, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section 3(ii)(A), below and for compliance as described in Section I-5.

Occasionally, the subrecipient may be a private for profit or not for profit entity. For these types of recipients, the provisions set forth in Roman Numeral II, below, shall apply. Although EPA and the State remain responsible for ensuring subrecipients' compliance with the wage rate requirements set forth herein, those subrecipients shall have the primary responsibility to maintain payroll records as described in Section II-3(ii)(A), below and for compliance as described in Section II-5.

I. Requirements Under The Consolidated and Further Continuing Appropriations Act, 2013 (P.L. 113-6) for Subrecipients That Are Governmental Entities:

The following terms and conditions specify how recipients will assist EPA in meeting its Davis-Bacon (DB) responsibilities when DB applies to EPA awards of financial assistance under the FY 2013 Continuing Resolution with respect to State recipients and subrecipients that are governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient. If a State recipient needs guidance, the recipient may contact Lorraine Fleury at fleury.lorraine@epa.gov or at 215-814-2341 of EPA, Region III Grants and Audit Management Branch for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at <http://www.dol.gov/whd/>

1. Applicability of the Davis-Bacon (DB) prevailing wage requirements.

Under the FY 2013 Continuing Resolution, DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.

2. Obtaining Wage Determinations.

- (a) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes

or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.

- (i) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov weekly to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.
 - (ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.
- (b) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.
- (c) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (d) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.
3. Contract and Subcontract provisions.
- (a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF 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 § 5.1 or the FY 2013 Continuing Resolution, the following clauses:

(1) Minimum wages.

- (i) All laborers and mechanics employed or working upon the site of the work 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.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

- (ii) (A) The subrecipient(s), on behalf of 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 State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official 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 subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits

under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The subrecipient(s), shall upon written request of the EPA Award Official 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, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

- (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (ii) (A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such

documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls 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 the weekly payrolls. 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/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 the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(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 the State, 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 Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees,

- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship 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 apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the

apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (iv) 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 determines may be appropriate, 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 Subrecipient(s), State, 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.

4. Contract Provision for Contracts in Excess of \$100,000.
 - (a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. 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 (a)(1) of this section the contractor and any subcontractor responsible therefore 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 (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.
 - (3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall 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 (a)(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 (a)(1) through (4) of this section.

- (b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

- (a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB.

Subrecipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence."

- (c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.

- (d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.
- (e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/contacts/whd/america2.htm>.

II. Requirements Under The Consolidated and Further Continuing Appropriations Act, 2013 (P.L. 113-6) for Subrecipients That Are Not Governmental Entities:

The following terms and conditions specify how recipients will assist EPA in meeting its DB responsibilities when DB applies to EPA awards of financial assistance under the FY2013 Continuing Resolution with respect to subrecipients that are not governmental entities. If a subrecipient has questions regarding when DB applies, obtaining the correct DB wage determinations, DB provisions, or compliance monitoring, it may contact the State recipient for guidance. If a State recipient needs guidance, the recipient may contact Julie Milazzo at Milazzo.julie@epa.gov or at 415-972-3687, EPA Grants Management Office for guidance. The recipient or subrecipient may also obtain additional guidance from DOL's web site at <http://www.dol.gov/whd/>

Under these terms and conditions, the subrecipient must submit its proposed DB wage determinations to the State recipient for approval prior to including the wage determination in any solicitation, contract task orders, work assignments, or similar instruments to existing contractors.

1. Applicability of the Davis- Bacon (DB) prevailing wage requirements.
Under the FY 2013 Continuing Resolution, DB prevailing wage requirements apply to the construction, alteration, and repair of treatment works carried out in whole or in part with assistance made available by a State water pollution control revolving fund and to any construction project carried out in whole or in part by assistance made available by a drinking water treatment revolving loan fund. If a subrecipient encounters a unique situation at a site that presents uncertainties regarding DB applicability, the subrecipient must discuss the situation with the recipient State before authorizing work on that site.
2. Obtaining Wage Determinations.
 - (a) Subrecipients must obtain proposed wage determinations for specific localities at www.wdol.gov. After the Subrecipient obtains its proposed wage determination, it must submit the wage determination to the Arkansas Natural Resources Commission's Water Resource Development Division for approval prior to inserting the wage determination into a solicitation, contract or issuing task orders, work assignments or similar instruments to

existing contractors (ordering instruments unless subsequently directed otherwise by the State recipient Award Official.

- (b) Subrecipients shall obtain the wage determination for the locality in which a covered activity subject to DB will take place prior to issuing requests for bids, proposals, quotes or other methods for soliciting contracts (solicitation) for activities subject to DB. These wage determinations shall be incorporated into solicitations and any subsequent contracts. Prime contracts must contain a provision requiring that subcontractors follow the wage determination incorporated into the prime contract.
 - (i) While the solicitation remains open, the subrecipient shall monitor www.wdol.gov on a weekly basis to ensure that the wage determination contained in the solicitation remains current. The subrecipients shall amend the solicitation if DOL issues a modification more than 10 days prior to the closing date (i.e. bid opening) for the solicitation. If DOL modifies or supersedes the applicable wage determination less than 10 days prior to the closing date, the subrecipients may request a finding from the State recipient that there is not a reasonable time to notify interested contractors of the modification of the wage determination. The State recipient will provide a report of its findings to the subrecipient.
 - (ii) If the subrecipient does not award the contract within 90 days of the closure of the solicitation, any modifications or supersedes DOL makes to the wage determination contained in the solicitation shall be effective unless the State recipient, at the request of the subrecipient, obtains an extension of the 90 day period from DOL pursuant to 29 CFR 1.6(c)(3)(iv). The subrecipient shall monitor www.wdol.gov on a weekly basis if it does not award the contract within 90 days of closure of the solicitation to ensure that wage determinations contained in the solicitation remain current.
- (c) If the subrecipient carries out activity subject to DB by issuing a task order, work assignment or similar instrument to an existing contractor (ordering instrument) rather than by publishing a solicitation, the subrecipient shall insert the appropriate DOL wage determination from www.wdol.gov into the ordering instrument.
- (d) Subrecipients shall review all subcontracts subject to DB entered into by prime contractors to verify that the prime contractor has required its subcontractors to include the applicable wage determinations.
- (e) As provided in 29 CFR 1.6(f), DOL may issue a revised wage determination applicable to a subrecipient's contract after the award of a contract or the issuance of an ordering instrument if DOL determines that the subrecipient has failed to incorporate a wage determination or has used a wage determination that clearly does not apply to the contract or ordering instrument. If this occurs, the subrecipient shall either terminate the contract or ordering instrument and issue a revised solicitation or ordering instrument or incorporate DOL's wage determination retroactive to the beginning of the contract or ordering instrument by change order. The subrecipient's contractor must be compensated for any increases in wages resulting from the use of DOL's revised wage determination.

3. Contract and Subcontract provisions.

- (a) The Recipient shall insure that the subrecipient(s) shall insert in full in any contract in excess of \$2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a treatment work under the CWSRF or a construction project under the DWSRF 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 § 5.1 or the FY 2013 Continuing Resolution, the following clauses:

(1) Minimum Wages.

- (i) All laborers and mechanics employed or working upon the site of the work, 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.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, www.dol.gov.

- (ii) (A) The subrecipient(s), on behalf of 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 State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
 - (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
 - (2) The classification is utilized in the area by the construction industry; and
 - (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
 - (B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient(s) to the State award official. The State award official will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official 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 and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request, and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.
 - (D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.
- (iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate,

the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

- (iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (2) Withholding. The subrecipient(s) shall upon written request of the EPA Award Official 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, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.
- (3) Payrolls and basic records.
 - (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of

apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

- (ii) (A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls 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 the weekly payrolls. 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/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 the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).
- (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 the State, 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 Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and Trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship 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 apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

- (ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (iv) 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 determines may be appropriate, 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 Subrecipient(s), State, 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.
4. Contract Provision for Contracts in Excess of \$100,000.
- (a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract

Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. 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 therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
 - (3) Withholding for unpaid wages and liquidated damages. The subrecipient shall upon the request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (a)(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.
- (b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract.

Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

5. Compliance Verification

- (a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.
- (b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicated that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence."
- (c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments there under by contractors and subcontractors who claim credit for fringe benefit contributions.
- (d) The subrecipient shall periodically review contractors and subcontractors use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

- (e) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB contact listed above and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/whd/america2.htm>.

Appendix B.

Rules and Regulations

Title 41- Public Contract and Property Management

Chapter 60 - Office of Federal Contract Compliance Programs, Equal Employment
Opportunity, Department of Labor

Compliance Responsibility for Equal Employment Opportunity

Final Rule

Part 60-1 Obligations of Contractors and Sub-Contractors

§60-1.4 Equal Opportunity Clause

(a) **FEDERALLY ASSISTED CONSTRUCTION CONTRACTS** (1) Except as otherwise provided, each administering agency shall require the inclusion of the following language as a condition of any grant, contract, loan, insurance, or guarantee involving federally assisted construction which is not exempt from the requirements of the equal opportunity clause:

The applicant hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 CFR Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to a grant, contract, loan insurance, or guarantee, or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee, the following equal opportunity clause:

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

- (2) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, 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, 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 form of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (3) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- (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 advising the said labor union or workers' representatives of the contractor's commitments under this section, 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 11246 of September 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 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, his books, records, and accounts by the administering 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 non-compliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 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 portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) 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 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 the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: PROVIDED, HOWEVER, That in the event a contractor becomes involved in or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interest of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: PROVIDED, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliances.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

(b) SUBCONTRACTS. Each nonexempt prime contractor or subcontractor shall include the equal opportunity clause in each of its nonexempt subcontracts.

(c) INCORPORATION BY REFERENCE. The equal opportunity clause may be incorporated by reference in all Government contracts and subcontracts, including Government bills of lading, transportation requests, contracts for deposit of Government funds, and contracts for issuing and paying U.S. savings bonds and notes, and such other contracts and subcontracts as the director may designate.

(d) INCORPORATION BY OPERATION OF THE ORDER. By operation of the Order, the equal opportunity clause shall be considered to be a part of every contract and subcontract required by the Order and the regulations in this part to include such a clause whether or not it is physically incorporated in such contracts and whether or not the contract between the agency and the contractor is written.

(e) ADAPTATION OF LANGUAGE. Such necessary changes in language may be made in the equal opportunity clause as shall be appropriate to identify properly the parties and their undertakings.

Part 60-4 - Construction Contractors - Affirmative Action Requirements
§60-4.2 Solicitations.

(a) All Federal contracting officers and all applicants shall include the notice set forth in paragraph (d) of this section and the Standard Federal Equal Employment Opportunity Construction Contract Specifications set forth in §60-4.3 of this part in all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts to be performed in geographical areas designated by the Director pursuant to §60-4.6 of the part. Administering agencies shall require the inclusion of the notice set forth in paragraph (d) of this section and the specifications set forth in §60-4.3 of this part as a condition of any grant, contract, subcontract, loan, insurance or guarantee involving federally assisted construction covered by this part 60-4.

(b) All nonconstruction contractors covered by Executive Order 11246 and the implementing regulations shall include the notice in paragraph (d) of this section in all construction agreements which are necessary in whole or in part to the performance of the covered nonconstruction contract.

(c) Contracting officers, applicants and nonconstruction contractors shall give (SIC) written notice to the Director within 10 working days of award of a contract subject to these provisions. The notification shall include the name, address and telephone number of the contractor; employer identification number; dollar amount of the contract, estimated starting and completion dates of the contract; the contract number; and geographical area in which the contract is to be performed.

(d) The following notice shall be included in, and shall be a part of, all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000 to be performed in geographical areas designed by the Director pursuant to §60-4.5 of this part (see 4) CFR 60-4.2 (a)):

NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL
EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246)

- (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 work force in each trade on all construction work in the covered area, are as follows:

Time Tables	Goals for minority participation for each trade	Goals for female participation in each trade
	Insert goals for each year.	Insert goals for each year.

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 nonfederally 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 specification 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 the 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 sub-contract 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; estimated dollar amount of the subcontract ; estimated starting and completion dates of the subcontract; and the geographical area in which the contract 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).

§60-4.3 EQUAL OPPORTUNITY CLAUSES;

(a) The equal opportunity clause published at 41 CFR 60-1.4 (a) of this chapter is required to be included in, and is part of, all nonexempt Federal contracts and subcontracts, including construction contracts and subcontracts. The equal opportunity clause published at 41 CFR 60-1.4 (b) is required to be included in, and is a part of, all nonexempt federally assisted construction contracts and subcontracts. In addition to the clauses described above, all Federal contracting officers, all applicants and all nonconstruction contractors as applicable, shall include the specifications set forth in this section in all Federal and federally assisted construction contracts in excess of \$10,000 to be performed in geographical areas designated by the Director pursuant to §60-4.6 of this part and in construction subcontracts in excess of \$10,000 necessary in whole or in

part to the performance of non-construction Federal contracts and subcontracts covered under the Executive Order.

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION
CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

- (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 Contracts Compliance Programs, United States Department of Labor, or any person to who 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 are 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 7a 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 of 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 the goals in each craft during the period specified.

- (5) Neither the provisions of any collective bargaining agreement, or 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 non-working 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. The 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 therefore, along with what-ever 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 complied under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the 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 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 new 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 obligation under these specifications are being carried out.
- n. Ensure that all facilities and company activities are nonsegregated 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 or more of their affirmative action obligations (7a through p). The efforts of contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participating may be asserted as fulfilling any one or more to 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 work force 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 to 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, 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 Contract fails to comply with the requirements to 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 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 of 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).
- (b) The notice set forth in 41 CFR 60-4.2 and the specifications set forth in 41 CFR 60-4.3 replace the New Form for Federal Equal Employment Opportunity Bid Conditions for Federal and Federally Assisted Construction published at 41 FR 32482 and commonly known as the Model Federal EEO Bid Conditions, and the New Form shall not be used after the regulations in 41 CFR part 60-4 become effective.

Appendix C.

40 CFR PART 33

PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES
IN UNITED STATES ENVIRONMENTAL PROTECTION AGENCY PROGRAMS

Subpart C—Good Faith Efforts

§ 33.301 What does this subpart require?

A recipient, including one exempted from applying the fair share objective requirements by § 33.411, is required to make the following good faith efforts whenever procuring construction, equipment, services and supplies under an EPA financial assistance agreement, even if it has achieved its fair share objectives under subpart D of this part:

- (a) Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
- (b) Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- (c) Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
- (d) Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
- (e) Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.
- (f) If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs (a) through (e) of this section.

§ 33.302 Are there any additional contract administration requirements?

- (a) A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient.
- (b) A recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor.
- (c) If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the six good faith efforts described in § 33.301 if soliciting a replacement subcontractor.
- (d) A recipient must require its prime contractor to employ the six good faith efforts described in § 33.301 even if the prime contractor has achieved its fair share objectives under subpart D of this part.

§ 33.303 Are there special rules for loans under EPA financial assistance agreements?

A recipient of an EPA financial assistance agreement to capitalize a revolving loan fund, such as a State under the CWRLF or DWSRF or an eligible entity under the Brownfields Cleanup Revolving Loan Fund program, must require that borrowers receiving identified loans comply with the good faith efforts described in § 33.301 and the contract administration requirements of § 33.302. This provision does not require that such private and nonprofit borrowers expend identified loan funds in compliance with any other procurement procedures contained in 40 CFR part 30, part 31, or part 35, subpart O, as applicable.

§ 33.304 Must a Native American (either as an individual, organization, Tribe or Tribal Government) recipient or prime contractor follow the six good faith efforts?

- (a) A Native American (either as an individual, organization, corporation, Tribe or Tribal Government) recipient or prime contractor must follow the six good faith efforts only if doing so would not conflict with existing Tribal or Federal law, including but not limited to the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e), which establishes, among other things, that any federal contract, subcontract, grant, or subgrant awarded to Indian organizations or for the benefit of Indians, shall require preference in the award of subcontracts and subgrants to Indian organizations and to Indian-owned economic enterprises.
- (b) Tribal organizations awarded an EPA financial assistance agreement have the ability to solicit and recruit Indian organizations and Indian-owned economic enterprises and give them preference in the award process prior to undertaking the six good faith efforts. Tribal governments with promulgated tribal laws and regulations concerning the solicitation and recruitment of Native-owned and other minority business enterprises, including women-owned business enterprises, have the discretion to utilize these tribal laws and regulations in lieu of the six good faith efforts. If the effort to recruit Indian organizations and Indian-owned economic enterprises is not successful, then the recipient must follow the six good faith efforts. All tribal recipients still must retain records documenting compliance in accordance with § 33.501 and must report to EPA on their accomplishments in accordance with § 33.502.
- (c) Any recipient, whether or not Native American, of an EPA financial assistance agreement for the benefit of Native Americans, is required to solicit and recruit Indian organizations and Indian-owned economic enterprises and give them preference in the award process prior to undertaking the six good faith efforts. If the efforts to solicit and recruit Indian organizations and Indian-owned economic enterprises is not successful, then the recipient must follow the six good faith efforts.
- (d) Native Americans are defined in § 33.103 to include American Indians, Eskimos, Aleuts and Native Hawaiians.

Appendix D.

MEMORANDUM

SUBJECT: Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014

FROM: Andrew Sawyers, Director
Office of Wastewater Management (4201M)

Peter Grevatt, Director
Office of Ground Water and Drinking Water (4601M)

TO: Water Management Division Directors
Regions I - X

P.L. 113-76, Consolidated Appropriations Act, 2014 (Act), includes an “American Iron and Steel (AIS)” requirement in section 436 that requires Clean Water State Revolving Loan Fund (CWSRF) and Drinking Water State Revolving Loan Fund (DWSRF) assistance recipients to use iron and steel products that are produced in the United States for projects for the construction, alteration, maintenance, or repair of a public water system or treatment works if the project is funded through an assistance agreement executed beginning January 17, 2014 (enactment of the Act), through the end of Fiscal Year 2014.

Section 436 also sets forth certain circumstances under which EPA may waive the AIS requirement. Furthermore, the Act specifically exempts projects where engineering specifications and plans were approved by a State agency prior to January 17, 2014.

The approach described below explains how EPA will implement the AIS requirement. The first section is in the form of questions and answers that address the types of projects that must comply with the AIS requirement, the types of products covered by the AIS requirement, and compliance. The second section is a step-by-step process for requesting waivers and the circumstances under which waivers may be granted.

Implementation

The Act states:

Sec. 436. (a)

(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.

(2) In this section, the term “iron and steel products” means the following products made primarily of iron or steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

(b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the “Administrator”) finds that—

- (1) applying subsection (a) would be inconsistent with the public interest;
- (2) iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
- (3) inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

(c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

(d) This section shall be applied in a manner consistent with United States obligations under international agreements.

(e) The Administrator may retain up to 0.25 percent of the funds appropriated in this Act for the Clean and Drinking Water State Revolving Funds for carrying out the provisions described in subsection (a)(1) for management and oversight of the requirements of this section.

(f) This section does not apply with respect to a project if a State agency approves the engineering plans and specifications for the project, in that agency’s capacity to approve such plans and specifications prior to a project requesting bids, prior to the date of the enactment of this Act.

The following questions and answers provide guidance for implementing and complying with the AIS requirements:

Project Coverage

What classes of projects are covered by the AIS requirement?

All treatment works projects funded by a CWSRF assistance agreement, and all public water system projects funded by a DWSRF assistance agreement, from the date of enactment through the end of Fiscal Year 2014. The AIS requirements apply to the entirety of the project, no matter when construction begins or ends. Additionally, the AIS requirements apply to all parts of the project, no matter the source of funding.

Covered Iron and Steel Products

What is an iron or steel product?

For purposes of the CWSRF and DWSRF projects that must comply with the AIS requirement, an iron or steel product is one of the following made primarily of iron or steel that is permanently incorporated into the public water system or treatment works:

- Lined or unlined pipes or fittings;
- Manhole Covers;
- Municipal Castings (defined in more detail below);
- Hydrants;
- Tanks;
- Flanges;
- Pipe clamps and restraints;
- Valves;
- Structural steel (defined in more detail below);
- Reinforced precast concrete; and
- Construction materials (defined in more detail below).

What does the term ‘primarily iron or steel’ mean?

‘Primarily iron or steel’ places constraints on the list of products above. For one of the listed products to be considered subject to the AIS requirements, it must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

Can you provide an example of how to perform a cost determination?

For example, the iron portion of a fire hydrant would likely be the bonnet, body and shoe, and the cost then would include the pouring and casting to create those components. The other material costs would include non-iron and steel internal workings of the fire hydrant (i.e., stem, coupling, valve, seals, etc.). However, the assembly of the internal workings into the hydrant body would not be included in this cost calculation. If one of the listed products is not made primarily of iron or steel, United States (US) provenance is not required. An exception to this definition is reinforced precast concrete, which is addressed in a later question.

If a product is composed of more than 50% iron or steel, but is not listed in the above list of items, must the item be produced in the US? Alternatively, must the iron or steel in such a product be produced in the US?

The answer to both question is no. Only items on the above list must be produced in the US. Additionally, the iron or steel in a non-listed item can be sourced from outside the US.

What is the definition of steel?

Steel means an alloy that includes at least 50 percent iron, between .02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel covers carbon steel, alloy steel, stainless steel, tool steel and other specialty steels.

What does ‘produced in the United States’ mean?

Production in the United States of the iron or steel products used in the project requires that all manufacturing processes, including application of coatings, must take place in the United States, with the exception of metallurgical processes involving refinement of steel additives. All manufacturing processes includes processes such as melting, refining, forming, rolling, drawing, finishing, fabricating and coating. Further, if a domestic iron and steel product is taken out of the US for any part of the manufacturing process, it becomes foreign source material. However, raw materials such as iron ore, limestone and iron and steel scrap are not covered by the AIS requirement, and the material(s), if any, being applied as a coating are similarly not covered. Non-iron or steel components of an iron and steel product may come from non-US sources. For example, for products such as valves and hydrants, the individual non-iron and steel components do not have to be of domestic origin.

Are the raw materials used in the production of iron or steel required to come from US sources?

No, raw materials, such as iron ore, limestone, scrap iron, and scrap steel, can come from non-US sources.

If an above listed item is primarily made of iron or steel, but is only at the construction site temporarily, must such an item be produced in the US?

No. Only the above listed products made primarily of iron or steel, permanently incorporated into the project must be produced in the US. For example trench boxes or scaffolding or equipment, which are removed from the project site upon completion of the project, are not required to be made of U.S. Iron or Steel.

What is the definition of ‘municipal castings’?

Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;
- Meter Boxes;
- Steel Hinged Hatches, Square and Rectangular;
- Steel Riser Rings;
- Trash receptacles;
- Tree Grates;
- Tree Guards;
- Trench Grates; and
- Valve Boxes, Covers and Risers.

What is ‘structural steel’?

Structural steel is rolled flanged shapes, having at least one dimension of their cross-section 3 inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zeos. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes.

What is a ‘construction material’ for purposes of the AIS requirement?

Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the project, not including mechanical and/or electrical components, equipment and systems. Some of these products may overlap with what is also considered “structural steel”. This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, gates, and screens.

What is not considered a ‘construction material’ for purposes of the AIS requirement?

Mechanical and electrical components, equipment and systems are not considered construction materials. Mechanical equipment is typically that which has motorized parts and/or is powered by a motor. Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials: pumps, motors, gear reducers, drives (including variable frequency drives (VFDs)), electrical/pneumatic/manual accessories used to operate valves (such as electric valve actuators), mixers, gates, motorized screens (such as traveling screens), blowers/aeration equipment, compressors, meters, sensors, controls and switches, supervisory control and data acquisition (SCADA), membrane bioreactor systems, membrane filtration systems, filters, clarifiers and clarifier mechanisms, rakes, grinders, disinfection systems, presses (including belt presses), conveyors, cranes, HVAC (excluding ductwork), water heaters, heat exchangers, generators, cabinetry and housings (such as electrical boxes/enclosures), lighting fixtures, electrical conduit, emergency life systems, metal office furniture, shelving, laboratory equipment, and analytical instrumentation, and dewatering equipment.

If the iron or steel is produced in the US, may other steps in the manufacturing process take place outside of the US, such as assembly?

No. Production in the US of the iron or steel used in a listed product requires that all manufacturing processes must take place in the United States, except metallurgical processes involving refinement of steel additives.

What processes must occur in the US to be compliant with the AIS requirement for reinforced precast concrete?

While reinforced precast concrete may not be at least 50% iron or steel, in this particular case, the reinforcing rebar must be produced in the US and meet the same standards as for any other iron or steel product. Additionally, the casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

If the reinforced concrete is cast at the construction site, the reinforcing rebar is considered to be a construction material and must be produced in the US.

Compliance

How should an assistance recipient document compliance with the AIS requirement?

In order to ensure compliance with the AIS requirement, specific AIS contract language must be included in each contract, starting with the assistance agreement, all the way down to the purchase agreements.

EPA recommends the use of a step certification process, similar to one used by the Federal Highway Administration. The step certification process is a method to ensure that producers adhere to AIS requirements and assistance recipients can verify that products comply with the AIS requirement. The process also establishes accountability and better enables States to take enforcement actions against violators.

Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc.) of the iron and steel products certifies that their step in the process was domestically performed. Each time a step in the manufacturing process takes place, the manufacturer delivers its work along with a certification of its origin. A certification can be quite simple. Typically, it includes the name of the manufacturer, the location of the manufacturing facility where the product or process took place (not its headquarters), a description of the product or item being delivered, and a signature by a manufacturer's responsible party. Attached, as Attachment 3, is a sample certification. These certifications should be collected and maintained by the assistance recipients.

Alternatively, the final manufacturer that delivers the iron or steel product to either the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US. While this type of certification may be acceptable, it may not provide the same degree of assurance. Additional documentation may be needed if the certification is lacking important information. Step certification is the best practice.

How should a State ensure assistance recipients are complying with the AIS requirement?

States should, as a best practice, conduct site visits of projects during construction and review documentation demonstrating proof of compliance which the assistance recipient has gathered.

What happens if a State or EPA finds a non-compliant iron and/or steel product permanently incorporated in the project?

If a potentially noncompliant product is identified, the State should notify the assistance recipient of the apparent unauthorized use of a non-domestic component, including a proposed corrective action, and should be given the opportunity to reply. If unauthorized use is confirmed, the State can take one or more of the following actions: request a waiver where appropriate; require the removal of the non-domestic item; or withhold payment for all or part of the project. Only EPA can issue waivers to authorize the use of a non-domestic item. EPA may use remedies available to it under the Clean Water Act, the Safe Drinking Water Act, and 40 CFR part 31 grant regulations in the event of a violation of a grant term and condition.

It is recommended that the State work collaboratively with EPA to determine the appropriate corrective action, especially in cases where the State is the one who identifies the item in noncompliance or there is a disagreement with the assistance recipient.

If fraud, waste, abuse, or any violation of the law is suspected, the Office of Inspector General (OIG) should be contacted immediately. The OIG can be reached at 1 (888) 546-8740 or OIG_Hotline@epa.gov. More information can be found at this website: <http://www.epa.gov/oig/hotline.htm>.

How do international trade agreements affect the implementation of the AIS requirements?

The AIS provision applies in a manner consistent with United States obligations under international agreements. Typically, these obligations only apply to direct procurement by the entities that are signatories to such agreements. In general, SRF assistance recipients are not signatories to such agreements, so these agreements have no impact on this AIS provision. In the few instances where such an agreement applies to a municipality, that municipality is under the obligation to determine its applicability and requirements and document the actions taken to comply for the State.

Waiver Process

The statute permits EPA to issue waivers for a case or category of cases where EPA finds (1) that applying these requirements would be inconsistent with the public interest; (2) iron and steel products are not produced in the US in sufficient and reasonably available quantities and of a satisfactory quality; or (3) inclusion of iron and steel products produced in the US will increase the cost of the overall project by more than 25 percent.

In order to implement the AIS requirements, EPA has developed an approach to allow for effective and efficient implementation of the waiver process to allow projects to proceed in a timely manner. The framework described below will allow States to apply for waivers of the AIS requirement directly to EPA Headquarters. Pursuant to the Act, EPA has the responsibility to make findings as to the issuance of waivers to the AIS requirements.

Definitions

The following terms are critical to the interpretation and implementation of the AIS requirements and apply to the process described in this memorandum:

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

Assistance Recipient: A borrower or grantee that receives funding from a State CWSRF or DWSRF program.

Step-By-Step Waiver Process

Application by Assistance Recipient

Each local entity that receives SRF water infrastructure financial assistance is required by section 436 of the Act to use American made iron and steel products in the construction of its project. However, the recipient may request a waiver. Until a waiver is granted by EPA, the AIS requirement stands, except as noted above with respect to municipalities covered by international agreements.

The waiver process begins with the SRF assistance recipient. In order to fulfill the AIS requirement, the assistance recipient must in good faith design the project (where applicable) and solicit bids for construction with American made iron and steel products. It is essential that the assistance recipient include the AIS terms in any request for proposals or solicitations for bids, and in all contracts. The assistance recipient may seek a waiver at any point before, during, or after the bid process, but before installation of the product, if one or more of the following three conditions is met:

1. Applying the American Iron and Steel requirements of the Act would be inconsistent with the public interest;
2. Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; or
3. Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Proper and sufficient documentation must be provided by the assistance recipient. A checklist detailing the types of information required for a waiver to be processed is attached as Attachment 1.

Additionally, it is strongly encouraged that assistance recipients hold pre-bid conferences with potential bidders. A pre-bid conference can help to identify iron and steel products needed to complete the project as described in the plans and specifications that may not be available from domestic sources. It may also identify the need to seek a waiver prior to bid, and can help inform the recipient on compliance options.

In order to apply for a project waiver, the assistance recipient should email the request in the form of a Word document (.doc) to the State SRF Engineer. The State SRF designee will review the application for the waiver and determine whether the necessary information has been included. Once the waiver application is complete, the State designee will forward the application to either of two email addresses. For CWSRF waiver requests, please send the application to: cwsrfwaiver@epa.gov. For DWSRF waiver requests, please send the application to: dwsrfwaiver@epa.gov.

Evaluation by EPA

After receiving an application for waiver of the AIS requirements, EPA Headquarters will publish the request on its website for 15 days and receive informal comment. EPA Headquarters will then use the checklist in Attachment 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.

In the event that EPA finds that adequate documentation and justification has been submitted, the Administrator may grant a waiver to the assistance recipient. EPA will notify the State designee that a waiver request has been approved or denied as soon as such a decision has been made. Granting such a waiver is a 3-step process:

1. Posting – After receiving a complete application for a waiver, EPA is required to publish the application and all material submitted with the application on EPA's website for 15 days. During that period, the public will have the opportunity to review the request and provide informal comment to EPA. The website can be found at: http://water.epa.grants_funding/aisrequirement.cfm
2. Evaluation – After receiving an application for waiver of the AIS requirements, EPA Headquarters will use the checklist in Attachment 2 to determine whether the application properly and adequately documents and justifies the statutory basis cited for the waiver – that it is quantitatively and qualitatively sufficient – and to determine whether or not to grant the waiver.
3. Signature of waiver approval by the Administrator or another agency official with delegated authority – as soon as the waiver is signed and dated, EPA will notify the State SRF program, and post the signed waiver on our website. The assistance recipient should keep a copy of the signed waiver in its project files.

Public Interest Waivers

EPA has the authority to issue public interest waivers. Evaluation of a public interest waiver request may be more complicated than that of other waiver requests so they may take additional time for a decision to be made. An example of a public interest waiver that might be issued could be for a community that has standardized on a particular type or manufacturer of a valve because of its performance to meet their specifications. Switching to an alternative valve may require staff to be trained on the new equipment and additional spare parts would need to be purchased and stocked, existing valves may need to be unnecessarily replaced, and portions of the system may need to be redesigned. Therefore, requiring the community to install an alternative valve would be inconsistent with public interest.

EPA also has the authority to issue a public interest waiver that covers categories of products that might apply to all projects.

EPA reserves the right to issue national waivers that may apply to particular classes of assistance recipients, particular classes of projects, or particular categories of iron or steel products. EPA may develop national or (U.S. geographic) regional categorical waivers through the identification of similar circumstances in the detailed justifications presented to EPA in a waiver request or requests. EPA may issue a national waiver based on policy decisions regarding the public's interest or a determination that a particular item is not produced domestically in reasonably available quantities or of a sufficient quality. In such cases, EPA may determine it is necessary to issue a national waiver.

If you have any questions concerning the contents of this memorandum, you may contact us, or have your staff contact Jordan Dorfman, Attorney-Advisor, State Revolving Fund Branch, Municipal Support Division, at dorfman.jordan@epa.gov or (202) 564-0614 or Kiri Anderer, Environmental Engineer, Infrastructure Branch, Drinking Water Protection Division, at anderer.kirsten@epa.gov or (202) 564-3134.

Attachment 1: Information Checklist for Waiver Request

The purpose of this checklist is to help ensure that all appropriate and necessary information is submitted to EPA. EPA recommends that waiver applicants review this checklist carefully and provide all appropriate information to EPA. This checklist is for informational purposes only and does not need to be included as part of a waiver application.

Items	✓	Notes
General <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Description of the foreign and domestic construction materials — Unit of measure — Quantity — Price — Time of delivery or availability — Location of the construction project — Name and address of the proposed supplier — A detailed justification for the use of foreign construction materials • Waiver request was submitted according to the instructions in the memorandum • Assistance recipient made a good faith effort to solicit bids for domestic iron and steel products, as demonstrated by language in requests for proposals, contracts, and communications with the prime contractor 		
Cost <ul style="list-style-type: none"> • Waiver request includes the following information: <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — Supporting documentation indicating that the contractor made a reasonable survey of the market, such as a description of the process for identifying suppliers and a list of contacted suppliers 		
Availability <ul style="list-style-type: none"> • Waiver request includes the following supporting documentation necessary to demonstrate the availability, quantity, and/or quality of the materials for which the waiver is requested: <ul style="list-style-type: none"> — Supplier information or pricing information from a reasonable number of domestic suppliers indicating availability/delivery date for construction materials — Documentation of the assistance recipient's efforts to find available domestic sources, such as a description of the process for identifying suppliers and a list of contacted suppliers. — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of construction materials • Waiver request includes a statement from the prime contractor confirming the non-availability of the domestic construction materials for which the waiver is sought • Has the State received other waiver requests for the materials described in this waiver request, for comparable projects? 		

Attachment 2: EPA HQ Review Checklist for Waiver Request

Instructions: To be completed by EPA. Review all waiver requests using the questions in the checklist, and mark the appropriate box as Yes, No or N/A. Marks that fall inside the shaded boxes may be grounds for denying the waiver. If none of your review markings fall into a shaded box, the waiver is eligible for approval if it indicates that one or more of the following conditions applies to the domestic product for which the waiver is sought:

1. The iron and/or steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality.
2. The inclusion of iron and/or steel products produced in the United States will increase the cost of the overall project by more than 25 percent.

Review Items	Yes	No	N/A	Comments
Cost				
<ul style="list-style-type: none"> • Does the waiver request include the following information? <ul style="list-style-type: none"> — Comparison of overall cost of project with domestic iron and steel products to overall cost of project with foreign iron and steel products — Relevant excerpts from the bid documents used by the contractors to complete the comparison — A sufficient number of bid documents or pricing information from domestic sources to constitute a reasonable survey of the market • Does the Total Domestic Project exceed the Total Foreign Project Cost by more than 25%? 				
Availability				
<ul style="list-style-type: none"> • Does the waiver request include supporting documentation sufficient to show the availability, quantity, and/or quality of the iron and/or steel product for which the waiver is requested? <ul style="list-style-type: none"> — Supplier information or other documentation indicating availability/delivery date for materials — Project schedule — Relevant excerpts from project plans, specifications, and permits indicating the required quantity and quality of materials • Does supporting documentation provide sufficient evidence that the contractors made a reasonable effort to locate domestic suppliers of materials, such as a description of the process for identifying suppliers and a list of contacted suppliers? • Based on the materials delivery/availability date indicated in the supporting documentation, will the materials be unavailable when they are needed according to the project schedule? (By item, list schedule date and domestic delivery quote date or other relevant information) • Is EPA aware of any other evidence indicating the non-availability of the materials for which the waiver is requested? Examples include: <ul style="list-style-type: none"> — Multiple waiver requests for the materials described in this waiver request, for comparable projects in the same State — Multiple waiver requests for the materials described in this waiver request, for comparable projects in other States — Correspondence with construction trade associations indicating the non-availability of the materials • Are the available domestic materials indicated in the bid documents of inadequate quality compared those required by the project plans, specifications, and/or permits? 				

Attachment 3: Sample Certification for Step Certification Process

The following information is provided as a sample letter of step certification for Build America, Buy American (BABA) compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address
City, State Zip

Subject: BABA Step Certification for Project (XXXXX-XXXXXXA)

I, (company representative), certify that the following products and/or materials shipped or provided for the subject project is in full compliance with the Build America, Buy America requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

The following information is provided as a sample letter of certification for Build America, Buy America (BABA) compliance. Documentation must be provided on company letterhead.

Date

Company Name

Company Address
City, State Zip

Subject: BABA Certification for Project (XXXXXX-XXXXXXA)

I, (company representative), certify that the following products and/or materials shipped/provided to the subject project are in full compliance with the Build America, Buy America requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. XXXX
2. XXXX
3. XXXX

If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Appendix E.

Prohibition on Certain Telecommunication and Video Surveillance Services
or Equipment in the SRF Programs

OFFICE OF WATER
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MEMORANDUM

SUBJECT: Prohibition on Certain Telecommunication and Video Surveillance Services or
Equipment in the SRF Programs

FROM: Kiri Anderer, P.E., Acting Associate Branch Chief
Infrastructure Branch, OGWDW

Michael Deane, Branch Chief
State Revolving Fund Branch, OWM

TO: SRF Branch Chiefs
Regions 1-10

Effective August 13, 2020, recipients and subrecipients of EPA funded assistance agreements, including borrowers under EPA funded revolving loan funds, must comply with regulations at 2 CFR 200.216, *Prohibition on certain telecommunication and video surveillance services or equipment*, implementing section 889 of Public Law 115-232. The regulation prohibits the use of Federal funds to procure (enter into, extend, or renew contracts) or obtain equipment, systems, or services that use “covered telecommunications equipment or services” identified in the regulation as a substantial or essential component of any system, or as critical technology as part of any system. Prohibitions extend to the use of Federal funds by recipients and subrecipients to enter into a contract with an entity that “uses any equipment, system, or service that uses covered telecommunications equipment or services” as a substantial or essential component of any system, or as critical technology as part of any system. Certain equipment, systems, or services, including equipment, systems, or services produced or provided by entities subject to the prohibition are recorded in the System for Award Management exclusion list.

As described in section 889 of Public Law 115-232, covered telecommunications equipment or services includes:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

- Telecommunications or video surveillance services provided by such entities or using such equipment.
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Applicability in the State Revolving Fund (SRF) Programs

Clean Water and Drinking Water SRF (CWSRF and DWSRF) programs may not expend equivalency funds for these products on or after August 13, 2020. States must ensure that equivalency assistance agreements include the telecommunications prohibition condition provided by EPA's Office of Grants and Debarment (OGD) in OGD's most recent EPA General Terms and Conditions. The condition must also be in construction contracts associated with equivalency assistance agreements.

There is no exhaustive list of components and services that fall under the prohibition. State SRF managers and local assistance recipients should exercise due diligence and be particularly mindful of project components with internet or cellular connections. For example, recipients should be mindful of automatic meter reading (AMR) technology and advanced metering infrastructure (AMI), instrumentation control systems (e.g. process control systems, distributed control systems and programmable logic controls), and security cameras and other electronic security measures to ensure that those items are procured from a non-excluded entity. Items included in the prohibition are not eligible SRF costs, and the SRF programs cannot reimburse borrowers for these costs.

The prohibition also applies to the CWSRF administrative funds (if states are billing those costs to the federal CWSRF capitalization grant) and the four DWSRF set-asides. States should be mindful of items such as cell phones, computers, and mobile WiFi routers or hotspots funded by those accounts.

If you have questions on the implementation of this grant condition, please contact Michael Deane at Deane.Michael@epa.gov or Kiri Anderer at Anderer.Kirsten@epa.gov.

"General Decision Number: AR20250047 01/03/2025

Superseded General Decision Number: AR20240047

State: Arkansas

Construction Type: Heavy
HEAVY CONSTRUCTION PROJECTS (Including Water and Sewer Lines)

Counties: Calhoun, Clark, Columbia, Dallas, Hempstead, Hot Spring, Howard, Lafayette, Montgomery, Nevada, Ouachita, Pike and Sevier Counties in Arkansas.

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none"> . Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least \$17.75 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 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none"> . Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least \$13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <http://www.dol.gov/whd/govcontracts>.

Modification Number Publication Date
0 01/03/2025

SUAR2015-044 01/09/2017

	Rates	Fringes
CARPENTER, Includes Form Work....	\$ 16.41 **	3.15
LABORER: Common or General.....	\$ 12.25 **	0.00
LABORER: Pipelayer.....	\$ 12.25 **	0.00
OPERATOR: Backhoe/Excavator/Trackhoe.....	\$ 17.90	0.00
OPERATOR: Bulldozer.....	\$ 20.10	0.00
TRUCK DRIVER: Dump Truck.....	\$ 13.12 **	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

=====

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 (\$17.75) or 13658 (\$13.30). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

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 <https://www.dol.gov/agencies/whd/government-contracts>.

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) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular

rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate 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. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the 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. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and

prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

- a) a survey underlying a wage determination
- b) an existing published wage determination
- c) an initial WHD letter setting forth a position on a wage determination matter
- d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail 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 an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail 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 any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

Wage and Hour Division

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)



Rev. Dec. 2008

OMB No.:1235-0008
Expires: 07/31/2024

NAME OF CONTRACTOR OR SUBCONTRACTOR						ADDRESS							OMB No.: 1235-0008 Expires: 07/31/2024		
PAYROLL NO.			FOR WEEK ENDING				PROJECT AND LOCATION					PROJECT OR CONTRACT NO.			
(1)	(2)	(3)	(4) DAY AND DATE	(5)	(6)	(7)	(8)					(9)			
NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	NO. OF WITHHOLDING EXEMPTIONS	WORK CLASSIFICATION		OT, OR ST.	TOTAL HOURS	RATE OF PAY	GROSS AMOUNT EARNED	DEDUCTIONS					NET WAGES PAID FOR WEEK		
								FICA	WITH- HOLDING TAX			OTHER		TOTAL DEDUCTIONS	
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Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by _____ on the _____
(Contractor or Subcontractor)
_____ ; that during the payroll period commencing on the _____
(Building or Work)
_____ day of _____, _____, and ending the _____ day of _____, _____,
all persons employed on said project have been paid the full weekly wages earned, that no rebates have
been or will be made either directly or indirectly to or on behalf of said
_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly
from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part
3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948,
63 Stat. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

(2) That any payrolls otherwise under this contract required to be submitted for the above period are
correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the
applicable wage rates contained in any wage determination incorporated into the contract; that the classifications
set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship
program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and
Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered
with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:
(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

- in addition to the basic hourly wage rates paid to each laborer or mechanic listed in
the above referenced payroll, payments of fringe benefits as listed in the contract
have been or will be made to appropriate programs for the benefit of such employees,
except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

- Each laborer or mechanic listed in the above referenced payroll has been paid,
as indicated on the payroll, an amount not less than the sum of the applicable
basic hourly wage rate plus the amount of the required fringe benefits as listed
in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR
SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 3729 OF
TITLE 31 OF THE UNITED STATES CODE.

EMPLOYEE RIGHTS

UNDER THE DAVIS-BACON ACT

FOR LABORERS AND MECHANICS EMPLOYED ON FEDERAL OR FEDERALLY ASSISTED CONSTRUCTION PROJECTS

**PREVAILING
WAGES**

You must be paid not less than the wage rate listed in the Davis-Bacon Wage Decision posted with this Notice for the work you perform.

OVERTIME

You must be paid not less than one and one-half times your basic rate of pay for all hours worked over 40 in a work week. There are few exceptions.

ENFORCEMENT

Contract payments can be withheld to ensure workers receive wages and overtime pay due, and liquidated damages may apply if overtime pay requirements are not met. Davis-Bacon contract clauses allow contract termination and debarment of contractors from future federal contracts for up to three years. A contractor who falsifies certified payroll records or induces wage kickbacks may be subject to civil or criminal prosecution, fines and/or imprisonment.

APPRENTICES

Apprentice rates apply only to apprentices properly registered under approved Federal or State apprenticeship programs.

PROPER PAY

If you do not receive proper pay, or require further information on the applicable wages, contact the Contracting Officer listed below:

or contact the U.S. Department of Labor’s Wage and Hour Division.



WAGE AND HOUR DIVISION
UNITED STATES DEPARTMENT OF LABOR

1-866-487-9243
TTY: 1-877-889-5627
www.dol.gov/whd



REVOLVING LOAN FUND (RLF)

Insurance

(Insert Insurance package here)