

NASSAU COUNTY PIGGYBACK AGREEMENT

THIS NASSAU COUNTY PIGGYBACK AGREEMENT (hereinafter "Agreement") is by and between the **NASSAU COUNTY BOARD OF COUNTY COMMISSIONERS**, hereinafter called "County" and **Insituform Technologies, LLC**, hereinafter called "Vendor".

WHEREAS, the County requires the following goods and services: Sanitary Sewer Cleaning, Inspection, and Renewal; and

WHEREAS, the Vendor has previously entered into a Contract with City of St. Augustine (hereinafter "Lead Contracting Agency"), pursuant to a formal competitive procurement process for the same goods and services (hereinafter "Original Contract"), a copy of which is attached hereto and incorporated herein as Exhibit "A"; and

WHEREAS, Section 1-141(d)(3) of the Nassau County Code of Ordinances, Purchasing Policy, allows for piggybacking for the same goods or services; and

WHEREAS, the County desires to access the Original Contract with the Vendor for the acquisition of said goods and services in accordance with the terms of the Exhibit "A".

NOW, THEREFORE, in consideration of the mutual covenants and agreements herein contained, the parties hereto agree as follows:

SECTION 1. Recitals.

1.1 The above recitals are true and correct and are incorporated herein, in their entirety, by this reference.

SECTION 2. Exhibits.

2.1 The Exhibits listed below are the exhibits incorporated into and made part of this Agreement:

Exhibit A ORIGINAL CONTRACT WITH LEAD CONTRACTING AGENCY

Exhibit B VENDOR'S PROPOSAL

SECTION 3. Prices, Parties and Additional Terms and Conditions.

3.1 The Vendor shall be compensated in an amount not to exceed Four Hundred Fifty Thousand Dollars and 00/100 (\$450,000.00) in accordance with Vendor's Proposal attached hereto and incorporated herein as Exhibit "B." The Vendor's Proposal shall reflect the pricing under the same terms and conditions as contained in Exhibit "A" or lower if needed but, cannot exceed the pricing listed in Exhibit "A".

3.2 All references to the Lead Contracting Agency in Exhibit “A” shall for the purpose of this Agreement be replaced with the words of “Nassau County” or “County”.

3.3 Any additional terms or conditions not set forth in this Agreement or any attachments whether submitted purposely or inadvertently, shall have no force or effect. In the event of any conflict between the terms of this Agreement and the terms of the Original Contract or any attachments, the terms of this Agreement shall prevail.

SECTION 4. Term of Agreement.

4.1 Notwithstanding any other provision of the Original Contract to the contrary, the term of this Agreement shall begin ~~October 1, 2024~~ ^{November 18, 2024} and end on September 30, 2025. *DP*

SECTION 5. Termination for Default.

5.1 If the Vendor fails to perform any of its obligations under this Agreement, and if such default remains uncured for a period of more than fifteen (15) days after notice thereof was given in writing by the County to the Vendor, then the County may, without prejudice to any right or remedy the County may have, terminate this Agreement.

5.2 Upon termination of this Agreement, the Vendor shall immediately (1) stop work on the date specified; (2) terminate and settle all orders and subcontracts relating to the performance of the terminated work; (3) transfer all work in process, completed work, and other materials related to the terminated work to the County; and (4) render to the County all property belonging to the County, including but not limited to, equipment, books, and records.

SECTION 6. Termination for Convenience.

6.1 The County reserves the right to terminate this Agreement in whole or part by giving the Vendor written notice at least thirty (30) days prior to the effective date of the termination. Upon receipt of written notice of termination from the County, the Vendor shall only provide those services and/or materials specifically approved or directed by the County. All other rights and duties of the parties under the Agreement shall continue during such notice period, and the County shall continue to be responsible to the Vendor for the payment of any obligations to the extent such responsibility has not been excused by breach or default of the Vendor. The Vendor shall promptly contact the County to make arrangements to render to the County all property belonging to the County, including but not limited to, equipment, books, and records.

SECTION 7. Public Records.

7.1 The County is a public agency subject to Chapter 119, Florida Statutes. **IF THE**

VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT (904) 530-6090, RECORDS@NASSAUCOUNTYFL.COM, 96135 NASSAU PLACE, SUITE 6, YULEE, FLORIDA 32097. Under this Agreement, to the extent that the Vendor is providing services to the County, and pursuant to Section 119.0701, Florida Statutes, the Vendor shall:

- a. Keep and maintain public records required by the public agency to perform the service.
- b. Upon request from the public agency's custodian of public records, provide the public agency with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in this chapter or as otherwise provided by law.
- c. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the agreement term and following completion of the Agreement if the Vendor does not transfer the records to the public agency.
- d. Upon completion of the Agreement, transfer, at no cost, to the public agency all public records in possession of the Vendor or keep and maintain public records required by the public agency to perform the service. If the Vendor transfers all public records to the public agency upon completion of the Agreement, the Vendor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Vendor keeps and maintains public records upon completion of the Agreement, the Vendor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from the public agency's custodian of public records, in a format that is compatible with the information technology systems of the County.
- e. A request to inspect or copy public records relating to a Nassau County

Agreement must be made directly to the Nassau County Custodian of Public Records. If Nassau County does not possess the requested records due to the Vendor maintaining the public records, then Nassau County shall immediately notify the Vendor of the request for records. The Vendor must provide the records to Nassau County or allow the records to be inspected or copied within a reasonable time. If the Vendor does not comply with Nassau County's request for records, Nassau County shall be entitled to enforce the Agreement provisions herein for failure to comply with the terms of the Agreement. Any Vendor which fails to provide public records to Nassau County within a reasonable time may also be subject to penalties as provided under Section 119.10, Florida Statutes, including punishment by fine or may be guilty of committing a misdemeanor of the first degree for any willful and knowing violation.

- f. If a civil action is filed against the Vendor to compel production of public records relating to the Agreement, the Court shall assess and award against the Vendor the reasonable costs of enforcement, including reasonable attorney fees if:
 - (a) The Court determines that the Vendor unlawfully refused to comply with the public records request within a reasonable time; and
 - (b) At least eight (8) business days before filing the action, the plaintiff provided written notice of the public records request, including a statement that the Vendor has not complied with the request, to the County and to the Vendor.
- g. A notice complies with this Section, if it is sent to the County's custodian of public records and to the Vendor at the Vendor's address listed on its Agreement with the County or to the Vendor's registered agent. Such notices shall be sent pursuant to Section 11.1 hereinbelow.
- h. If the Vendor complies with a public records request within eight (8) business days after the notice is sent, the Vendor is not liable for the reasonable costs of enforcement.
- i. In reference to any public records requested under this Agreement, the Vendor shall identify and mark specifically any information which the Vendor considers confidential and/or proprietary, inclusive of trade secrets as defined in Section 812.081, Florida Statutes, and which the Vendor believes to be exempt from

disclosure, citing specifically the applicable exempting law and including a brief written explanation as to why the cited Statute is applicable to the information claimed as confidential and/or proprietary information. All materials shall be segregated and clearly identified as "EXEMPT FROM PUBLIC DISCLOSURE."

- j. In conjunction with the confidential and/or proprietary information designation, the Vendor acknowledges and agrees that after notice from County, the Vendor shall respond to a notice from the County immediately, but no later than 10 calendar days from the date of notification or the Vendor shall be deemed to have waived and consented to the release of the confidential and/or proprietary designated materials.
- k. The Vendor further agrees that by designation of the confidential/proprietary material, the Vendor shall defend the County (and its employees, agents and elected and appointed officials) against all claims and actions (whether or not a lawsuit is commenced) related to the Vendor's designation of the material as exempt from public disclosure and to hold harmless the County (and its employees, agents and elected and appointed officials) from any award to a plaintiff for damages, costs and attorneys' fees, incurred by the County by reason of any claim or action related to the Vendor's designation of material as exempt from public disclosure.

SECTION 8. E-Verify.

8.1 The Vendor shall comply with Section 448.095, Florida Statutes, and use the United States Department of Homeland Security's E-Verify system ("E-Verify") to verify the employment eligibility of all persons hired by the Vendor during the term of this Agreement to work in Florida. Additionally, if the Vendor uses subcontractors to perform any portion of the work (under this Agreement), the Vendor shall include a requirement in the subcontractor's contract that the subcontractor use E-Verify to verify the employment eligibility of all persons hired by subcontractor to perform any such portion of the work. Answers to questions regarding E-Verify as well as instructions on enrollment may be found at the E-Verify website: www.uscis.gov/e-verify.

8.2 The Vendor shall maintain records of its participation and compliance with the provisions of the E-Verify program, including participation by its subcontractors as provided

above, and to make such records available to the County or other authorized entity consistent with the terms of the Vendor's enrollment in the program. This includes maintaining a copy of proof of the Vendor's and subcontractors' enrollment in the E-Verify program. If the Vendor enters into a contract with a subcontractor, the subcontractor shall provide the Vendor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The Vendor shall maintain a copy of such affidavit for the duration of the Agreement.

8.3 Compliance with the terms of the E-Verify program provision is made an express condition of this Agreement and the County may treat a failure to comply as a material breach of the Agreement. If the County terminates the Agreement pursuant to Section 448.095(2)(c), Florida Statutes, the Vendor may not be awarded a public contract for at least one (1) year after the date on which the Agreement was terminated and the Vendor is liable for any additional costs incurred by the County as a result of the termination of this Agreement.

SECTION 9. Prompt Payment Act.

9.1 All payments shall be made in accordance with the Local Government Prompt Payment Act, Chapter 218, Florida Statutes.

SECTION 10. Indemnity.

10.1 The Vendor shall indemnify and hold harmless the County and its agents and employees from all claims, liabilities, damages, losses, expenses and costs, including attorney's fees, arising out of or associated with or caused by the negligence, recklessness, or intentionally wrongful conduct of the Vendor or any persons employed or utilized by the Vendor, in the performance of this Contract. The Vendor shall, at its own expense, defend any and all such actions, suits, or proceedings which may be brought against the County in connection with the Vendor's performance under this Contract.

SECTION 11. Notices.

11.1 All notices to the County under this Agreement shall be deemed served if sent in a manner requiring signed receipt of delivery, such as Federal Express, or if mailed, Registered or Certified Mail, return receipt requested as follows:

Point of Contact: Public Works Director

Address: 45195 Musselwhite Rd.

Callahan, Fl 32011

Telephone Number: 904-530-6120

E-mail Address: dpodiak@nassaucountyfl.com

SECTION 12. Fiscal Funding.

12.1 This Agreement is subject to the availability of the County funding for each item and obligation and may be terminated without liability, penalty or further obligation other than payment of fees then due and owing.

SECTION 13. Indemnification.

13.1 The Vendor shall indemnify and hold harmless the County and its agents and employees from all claims, liabilities, damages, losses, expenses and costs, including attorney's fees, arising out of or associated with or caused by the negligence, recklessness, or intentionally wrongful conduct of the Vendor or any persons employed or utilized by the Vendor, in the performance of this Agreement. The Vendor shall, at its own expense, defend any and all such actions, suits, or proceedings which may be brought against the County in connection with the Vendor's performance under this Agreement.

SECTION 14. Insurance.

14.1 The Vendor shall provide and maintain at all times during the term of this Agreement, without cost or expense to the County, such commercial (occurrence form) or comprehensive general liability, workers compensation, professional liability, and other insurance policies as detailed in Exhibit "A". The policy limits required are to be considered minimum amounts.

14.2 The Vendor shall provide to the County a Certificate of Insurance for all policies of insurance and renewals thereof in a form acceptable to the County. Said certificates shall provide that the Nassau County Board of County Commissioners is an additional insured, and that the County shall be notified in writing of any reduction, cancellation or substantial change of policy or policies at least thirty (30) days prior to the effective date of said action with the exception of ten (10) days for non-payment. All insurance policies shall be issued by responsible companies who are acceptable to the County and licensed and authorized under the laws of the State of Florida.

SECTION 15. Independent Vendor Status.

15.1 The Vendor shall perform the services under this Agreement as an independent contractor and nothing contained herein shall be construed to be inconsistent with this

relationship or status. Nothing in this Agreement shall be interpreted or construed to constitute the Vendor or any of its agents or employees to be an agent, employee or representative of the County.

15.2 The Vendor and the County agree that during the term of this Agreement: (a) the Vendor has the right to perform services for others; (b) the Vendor has the right to perform the services required by this Agreement; and (c) the Vendor has the right to hire assistants as subcontractors, or to use employees to provide the services required by this Agreement.

SECTION 16. Taxes, Liens, Licenses and Permits.

16.1 The Vendor recognizes that the County, by virtue of its sovereignty, is not required to pay any taxes on the services or goods purchased under the terms of this Agreement. As such, the Vendor shall refrain from including taxes in any billing. The Vendor is placed on notice that this exemption generally does not apply to nongovernmental entities, contractors, or subcontractors. Any questions regarding this tax exemption shall be addressed to the County Manager.

16.2 The Vendor shall secure and maintain all licenses and permits required to perform the services under this Agreement and to pay any and all applicable sales or use tax, or any other tax or assessment which shall be imposed or assessed by any and all governmental authorities, required under this Agreement, and to meet all federal, state, county and municipal laws, ordinances, policies and rules.

16.3 The Vendor acknowledges that property being improved that is titled to the County, shall not be subject to a lien of any kind for any reason. The Vendor shall include notice of such exemptions in any subcontracts and purchase orders issued under this Agreement.

SECTION 17. Assignment.

17.1 The Vendor shall not assign, sublet, convey or transfer its interest in this Agreement without the prior written consent of the County.

SECTION 18. Compliance with Laws.

18.1 The Vendor agrees to comply with all applicable federal, state and local laws, rules and regulations during the term of this Agreement.

SECTION 19. Governing Law and Venue.

19.1 This Agreement shall be interpreted and construed in accordance with the laws of the State of Florida with Venue for any action brought in Nassau County, Florida.

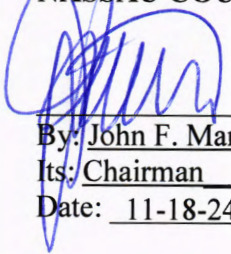
Contract Tracking No. CM3656

SECTION 20. Severability.

20.1 If any section, subsection, sentence, clause, phrase, or portion of this Agreement is, for any reason, held invalid, unconstitutional, or unenforceable by any Court of Competent Jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

IN WITNESS WHEREOF, the parties have executed this Agreement which shall be deemed an original on the day and year last written below.

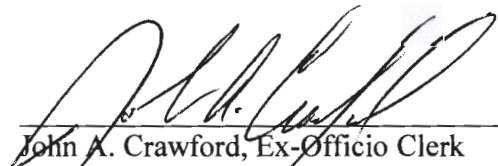
**BOARD OF COUNTY COMMISSIONERS
NASSAU COUNTY, FLORIDA**


By: John F. Martin, Chairman
Its: Chairman
Date: 11-18-24

INSTITUFORM TECHNOLOGIES, LLC

Diane Partridge
By: Diane Partridge
Its: Contracting and Attesting Officer
Address: 580 Goddard Ave., Chesterfield, MO 63005
Date: 10/1/2024

ATTEST TO CHAIR'S SIGNATURE


John A. Crawford, Ex-Officio Clerk
Date: NOV 18 2024

Approved as to form by County Attorney

Denise C. May
Denise C. May, County Attorney
Date: 10/14/2024

EXHIBIT "A"
ORIGINAL CONTRACT WITH LEAD CONTRACTING AGENCY
CONSTRUCTION SERVICES AGREEMENT
BETWEEN THE
CITY OF ST. AUGUSTINE
AND INSITUFORM TECHNOLOGIES, LLC
FOR SANITARY SEWER CLEANING, INSPECTION AND RENEWAL

THIS AGREEMENT is entered into by and between the CITY OF ST. AUGUSTINE ("the City"), whose address is P. O. Box 210, St. Augustine, Florida 32085-0210, and INSITUFORM TECHNOLOGIES, LLC ("Contractor"), whose address is 17988 Edison Avenue, Chesterfield, Missouri 63005. All references to the parties hereto include the parties, their officers, employees, agents, successors, and assigns.

In consideration of the payments hereinafter specified, the covenants and conditions of this Agreement, and other good and valuable consideration, the adequacy of which is hereby acknowledged, Contractor agrees to furnish and deliver all materials and perform all services and labor required for ("the Work"). In accordance with RFP Number PW2020-06, Contractor shall complete the Work in conformity with this Agreement, which consists of and incorporates all of the following documents: (1) advertisement for proposals; (2) Instructions to Respondents; (3) addenda; certifications, and affidavits; (4) proposal submittals; and (5) this Agreement, including the Scope of Work, Specifications, General Conditions and any Special Conditions or other attachments. If any provision in the body of this Agreement conflicts with any attachment hereto, the terms of this Agreement shall prevail unless the referenced attachment is a requirement pursuant to grant funding. This Agreement, including attachments, shall take precedence over all solicitation documents (items 1 - 4). The parties hereby agree to the following terms and conditions.

1. TERM OF AGREEMENT

- (a) The term of this Agreement shall run from the Effective Date to the Final Completion Date. Time is of the essence for each and every aspect of this Agreement. Where additional time is allowed to complete the Work, the new time limit shall also be of the essence. All provisions of this Agreement that by their nature extend beyond the Completion Date shall survive termination or expiration of this Agreement.
- (b) **Effective Date.** The Effective Date is the date upon which the last party to this Agreement has dated and executed the same.
- (c) **Completion Date.** The Completion Date of this Agreement is September 30, 2021, unless extended by mutual written agreement of the parties. The Completion Date for specific work orders shall be the time for completion stated in the work order; which shall be agreed upon by both parties.
- (d) This Agreement may be renewed by mutual and written consent of each party for no more than a total of four (4) consecutive years.

2. COMMENCEMENT OF WORK

- (a) Contractor shall commence the Work within fourteen (14) days of issuance of a Work Order by the City, this date shall be known as the "Commencement Date." Contractor shall prosecute the Work regularly, diligently, and uninterruptedly so as to complete the Work ready for use in accordance with the Scope of Work and the time for completion stated therein. Contractor shall not commence the Work until any required submittals are received and approved.

3. LIQUIDATED DAMAGES

- (a) If Contractor neglects, fails, or refuses to satisfactorily complete the Work by the Completion Date, Contractor shall, as a part of the consideration for this Agreement, pay the City the amount stipulated herein, not as a penalty, but as liquidated damages for such breach, for each calendar day Contractor is in default thereafter. This amount is fixed and agreed upon between the parties due to the impracticability and extreme difficulty of ascertaining the actual damages the City would sustain in such event. The amount of liquidated damages shall be \$500.00 per day. Liquidated damages shall be deducted from payments as they become due and may be deducted from the retainage due upon completion. They constitute an agreed-upon liquidated sum solely for consequential damages attributable to delay and are not a substitute for any other consequential damages incurred by the City, such as the cost of finding a replacement Contractor for completion of the Work if this Agreement is terminated by the City for non-performance.
- (b) Contractor shall not be charged with liquidated damages or any excess cost when the City determines that Contractor's reasons for the time extension are acceptable in accordance with **FORCE MAJEURE; DELAYS; EXTENSION OF COMPLETION DATE, as described below**. A written extension of the Completion Date constitutes a waiver of liquidated damages to the new Completion Date unless expressly provided therein to the contrary.

4. DELIVERABLES

- (a) The Work is specified in the Scope of Work, Exhibit A. Contractor shall deliver all products and deliverables as stated therein. Contractor is responsible for the professional quality, technical accuracy, and timely completion of the Work. Both workmanship and materials shall be of good quality. Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials provided. Unless otherwise specifically provided for herein, Contractor shall provide and pay for all materials, labor, and other facilities and equipment necessary for performance of the Work. The City's Project Manager shall make a final acceptance inspection of the deliverables when completed and finished in all respects.
- (b) If not otherwise addressed in the Scope of Work and/or Specifications, upon written request, Contractor shall submit written progress reports to the City's Project Manager at the frequency requested in the form approved by the Project Manager at no additional cost to the City. The progress report shall provide an updated progress schedule, taking into account all delays and approved changes in the Work. Failure to provide a progress report will be cause to withhold payment.

5. OWNERSHIP OF DELIVERABLES

All deliverables, including Work not accepted by the City, are City property when Contractor has received compensation therefor, in whole or in part. Any City source documents or other City or non-City documents, specifications, materials, reports, or accompanying data developed, secured, or used in the performance of the Work, excluding proprietary materials, as outlined in the Statement of Work, are City property and shall be safeguarded and provided to the City upon request. City plans and specifications shall not be used on other work and, with the exception of the original plans and specifications, shall be returned to the City upon request. This obligation shall survive termination or expiration of this Agreement.

6. FUNDING OF AGREEMENT

- (a) For satisfactory performance of the Work, the City agrees to pay Contractor in accordance with the Unit Price Schedule, Exhibit D and as set forth in each Work Order and billed in accordance with the terms of the Work Order.

7. PAYMENT OF INVOICES

- (a) Contractor shall submit monthly itemized invoices by one of the following two methods: (1) by mail to the City of St. Augustine, Financial Management, P. O. Box 210, St. Augustine, FL 32085-0210, or (2) by e-mail to purchasing@citystaug.com. Each invoice shall be submitted in detail sufficient for proper pre-audit and post-audit review. If necessary, for audit purposes, Contractor shall provide additional supporting information as required to document invoices.

8. CONTRACT PAYMENT AND COMPLIANCE WITH THE LOCAL GOVERNMENT PROMPT PAYMENT ACT

- (a) Each month, the Contractor shall submit an application for payment for work performed to that point. The Owner will process and issue payment in compliance with the requirements of the Florida Local Government Prompt Payment Act as described below. Final payment in the amount of ten percent (10%) of the total project amount will be retained pending final inspection and acceptance of the project by the Owner and proof of complete payment to all subcontractors and suppliers.
- (b) All invoices shall include the following information: (1) City contract number; (2) City encumbrance number; (3) City work-order number, if applicable; (4) Contractor's name and address (include remit address, if necessary); (5) Contractor's invoice number and date of invoice; (6) City Project Manager or Work Order Manager, if applicable; (7) Contractor's Project Manager; (8) supporting documentation as to cost and/or project completion (as per the cost schedule and other requirements of the Statement of Work; for work-orders, see special requirements under **WORK ORDERS**); (9) Progress Report (if required); (10) Diversity Report (if otherwise required herein). Invoices that do not correspond with this paragraph shall be returned without action, stating the basis for rejection. Payments shall be made within twenty (20) business days of receipt of an approved invoice. Disputes regarding invoice sufficiency are resolved pursuant to the dispute resolution procedure of this Agreement.
- (c) As conditions precedent to final payment under this Contract, the Contractor shall furnish any manufacturers' guarantees or warranties for materials provided or equipment installed in the Work; shall have performed all other requirements pursuant to the Contract Documents; shall warrant all workmanship for a period of one (1) year after the date of final acceptance of the Work by the Owner and shall furnish signed copies of the Contractor's Warranty Guarantees signed by Contractor, subcontractors, materialsmen, suppliers, laborers or others furnishing work, labor, materials, machinery or fixtures in the performance of the Work. The City shall be the expressly designated beneficiary of any and all Warranty Guarantees. Acceptance of any Work or any possession taken by Owner shall not operate as a waiver of any provision of the Contract Documents or any right or power reserved to Owner, including any right to damages provided in the Contract Documents.

- (d) In order to comply with the provisions of the Florida Local Government Prompt Payment Act, the City designates the following as its Agent:
1. James Wheeler, P.E.
Public Works Department
City of St. Augustine
P.O. Box 210
St. Augustine, FL 32085-0210
904-209-4276 (Office)
904-209-4286 (Fax)
Email: jwheeler@citystaug.com
 2. The City's Agent is required to review invoices or payment requests prior to processing for payment.
 3. The due date for payment of construction services by the City shall be determined as follows:
 - a) If the City's agent must approve the payment request or invoice submitted by the Contractor before the payment request or invoice is submitted to the City, payment shall be due twenty-five (25) business days after the date on which the payment request or invoice is stamped as received as provided in Section 218.74(1), F.S. The Contractor may send the City an overdue notice. If the payment request or invoice is not rejected within four (4) business days after delivery of the overdue notice, the payment request or invoice shall be deemed accepted, except for any portion of the payment request or invoice that is fraudulent or misleading.
 - b) If the City's agent need not approve the payment request or invoice submitted by the Contractor, payment is due twenty (20) business days after the date on which the payment request or invoice is stamped as received as provided in Section 218.74(1), F.S.
 - c) If a payment request or invoice submitted by the Contractor does not meet the contract requirements, the City must reject the payment request or invoice within twenty (20) business days after the date on which the payment request or invoice is stamped as received as provided in Section 218.74(1), F.S. The rejection must be written and must specify the deficiency and the action necessary to make the payment request or invoice proper.
 - d) If a payment request or invoice is rejected and the Contractor submits a payment request or invoice which corrects the deficiency, the corrected payment request or invoice must be paid or rejected ten (10) business days after the date the corrected payment request or invoice is stamped as received as provided in Section 218.74(1), F.S.
 - e) If a dispute between the City and the Contractor cannot be resolved by the procedure described above, the dispute shall be resolved in accordance with the dispute resolution procedure described in Section 217.76(2), F.S.

- f) If the City disputes only a portion of a payment request or invoice submitted by the Contractor, the City shall pay the undisputed portion in a timely manner in accordance with subsections (a) and (b) above.

4. Punch List

- a) For projects less than \$10,000,000.00.
Within thirty (30) calendar days of reaching Substantial Completion of the Work as defined in the Contract or, if not defined in the Contract, upon reaching beneficial occupancy or use, the City's Project Manager, the Project Engineer and the Contractor shall review the work, note any deficiencies and develop a single list of items required to render the construction services purchased by the City complete, satisfactory and acceptable. The list shall be delivered to the

Contractor no later than five (5) calendar days after it has been developed and reviewed.

- b) For projects more than \$10,000,000.00.
Within thirty (30) calendar days or, if extended by Contract, up to sixty (60) calendar days, of reaching Substantial Completion of the Work or, if not defined in the contract, upon reaching beneficial occupancy or use, the City's Project Manager, the Project Engineer and the Contractor shall review the Work, note any deficiencies and generate a list of items required to render the construction services purchased by the City complete, satisfactory and acceptable. The list shall be delivered to the Contractor no later than five (5) days after it has been developed and reviewed.

- c) The Final Contract Completion Date shall be no fewer than thirty (30) days after delivery of the list of items. If the list is not provided to the Contractor by the agreed upon date for delivery of the list, the Contract Term for completion shall be extended by the number of days the City exceeded the delivery date.

- (e) **Payments withheld.** The City may withhold or, on account of subsequently discovered evidence, nullify, in whole or in part, any payment to such an extent as may be necessary to protect the City from loss as a result of: (1) defective Work not remedied; (2) failure of Contractor to make payments when due to subcontractors or suppliers for materials or labor; (3) failure to maintain adequate progress in the Work; (4) damage to another contractor; or (5) any other material breach of this Agreement. Amounts withheld shall not be considered due and shall not be paid until the ground(s) for withholding payment have been remedied.

- (f) **Payments.** The City shall pay Contractor one hundred percent (100%) of each approved invoice.

- 9. **COST OF LIVING INCREASES.** A Consumer Price Index ("CPI") – based Cost Schedule increase may be requested in writing no later than three months before the contract renewal date. The increase will be limited to the lesser of five percent or the result of the CPI percentage increase calculation expressed below. The CPI percentage increase shall be calculated by using the Consumer Price Index for All Urban Consumers ("CPI-U") numbers provided by the Bureau of Labor Statistics. The CPI percentage increase shall be calculated by subtracting from the most recent May CPI-U number the CPI-U number for the previous May, then dividing the remainder by the previous May's number, and finally, multiplying the quotient by 100. Cost Schedule

increases shall be prorated based upon the number of calendar months in the City's fiscal year that the contract has been in effect. (For example, a cost schedule increase for renewal of a contract initiated in March (six months into the City's fiscal year), would be limited to the lesser of either one-half of the CPI percentage increase or 2.5 percent upon renewal in October.) In the event this contract includes a provision for fuel adjustment, and an upward fuel adjustment is made during the contract year, the CPI percentage increase shall be multiplied by the percentage of the Total Compensation allocated to non-fuel costs. For example, if it is determined that the cost of fuel is 20 percent of the Total Compensation, the CPI percentage increase shall be multiplied by 0.8.

10. **PAYMENT AND RELEASE** Contractor's acceptance of final payment shall constitute a release in full of all Contractor claims against the City arising from the performance of this Agreement, with the exception of any pending claims for additional compensation that have been documented and filed as required by this Agreement.
11. **INDEMNIFICATION** Contractor shall indemnify and hold harmless, release, and forever discharge the City, its public officers, employees, agents, representatives, successors, and assigns, from any and all liabilities, damages, losses, and costs, including, but not limited to, reasonable attorney's fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Contractor, its employees or sub-contractors, in the performance of the Work and resulting from damages to property, personal injury, or loss of life.
12. **INSURANCE AND PERMITS.** Contractor shall acquire and maintain, at its own expense, all permits, and licenses required by law and shall maintain the same in full force and effect. Contractor is responsible for conformance with all State and Federal regulations and requirements. City of St. Augustine permit fees shall be waived.

Contractor shall provide all insurance required by Exhibit B, Insurance Requirements, and shall not commence Work until it has provided Certificates of Insurance to the City as per Exhibit B. Receipt of Certificates of Insurance indicating less coverage than required does not constitute a waiver of the Insurance Requirements. Contractor waives its right of recovery against the City to the extent permitted by its insurance policies. Contractor's insurance shall be considered primary, and City insurance shall be considered excess, as may be applicable to Contractor's obligation to provide insurance.

13. **FUNDING CONTINGENCY.** This Agreement is at all times contingent upon funding availability, which may include a single source or multiple sources, including, but not limited to: (1) ad valorem tax revenues appropriated by the City's Commission; (2) annual appropriations by the Florida Legislature, or (3) appropriations from other agencies or funding sources. Agreements that extend for a period of more than one Fiscal Year are subject to annual appropriation of funds in the sole discretion and judgment of the City's Commission for each succeeding Fiscal Year. Should the Work not be funded, in whole or in part, in the current Fiscal Year or succeeding Fiscal Years, the City shall so notify Contractor and this Agreement shall be deemed terminated for convenience five (5) days after receipt of such notice, or within such additional time as the City may allow. For the purpose of this Agreement, "Fiscal Year" is defined as the period beginning on October 1 and ending on September 30.

14. **PROJECT MANAGEMENT AND PERSONNEL**

- (a) The Project Managers listed below shall be responsible for overall coordination and management of the Work. Either party may change its Project Manager upon three (3) business days prior written notice to the other party. Written notice of change of address

shall be provided within five (5) business days. All notices shall be in writing to the Project Managers at the addresses below and shall be sent by one of the following methods: (1) hand delivery; (2) U.S. certified mail; (3) national overnight courier; (4) e-mail or, (5) fax. Notices via certified mail are deemed delivered upon receipt. Notices via overnight courier are deemed delivered one (1) business day after having been deposited with the courier. Notices via e-mail or fax are deemed delivered on the date transmitted and received.

CITY

James Wheeler, P.E., Project Manager
 City of St. Augustine
 P.O. Box 210
 St. Augustine, Florida 32085-0210
 904-209-4276 (office)
 904-209-4286 (fax)
 E-mail: jwheeler@citystaug.com

CONTRACTOR

Brandt Curvel, Project Manager
 Insituform Technologies, LLC
 6966 Business Park Boulevard
 Jacksonville, Florida 32256
 904-838-0090 (cell)
 904-292-3198 (fax)
 E-mail: bcurvel@aegion.com

- (b) The City's Project Manager shall have sole and complete responsibility for transmitting instructions, receiving information, and communicating City policies and decisions regarding all matters pertinent to performance of the Work, and may approve minor deviations in the Work that do not affect the Total Compensation or Completion Date or otherwise significantly modify the terms of the Agreement. For Work Order-based contracts, the City may designate a "Work Order Manager" on the Work Order, who will serve as the Project Manager for that Work Order and shall have the same responsibilities as the City's Project Manager. The City's Project Manager may approve minor deviations in the Work that do not affect the Total Compensation or Completion Date or otherwise significantly modify the terms of the Agreement. The City's Project Manager and, as appropriate, other City employees, shall meet with Contractor when necessary in the City's judgment to provide decisions regarding performance of the Work, as well as to review and comment on reports.
- (c) Contractor shall provide efficient supervision of the Work, using its best skill and attention. Contractor shall keep on the worksite during its progress a competent superintendent, satisfactory to the City. The superintendent shall not be changed except with the City's consent, unless the superintendent proves to be unsatisfactory to Contractor and/or ceases to be in its employ. The superintendent shall represent Contractor in the absence of Contractor's Project Manager. All directions given to him shall be as binding as if given to Contractor. If the City produces documented evidence and informs the Contractor that any person on the job is incompetent, disorderly, or is working contrary to the Agreement or the City's instructions, that person shall thereupon be immediately dismissed from the project and shall not be given employment on any work connected with this Agreement. The City may request Contractor replace its Project Manager if said manager fails to carry the Work forward in a competent manner, follow instructions or specifications, or for other reasonable cause.
- (d) Contractor shall maintain an adequate and competent professional staff. Contractor's employees, subcontractors, or agents shall be properly trained to meet or exceed any specified licensing, training and/or certification applicable to their profession. Upon request, Contractor shall furnish proof thereof.

15. SCHEDULING AND WORK PLANNING; PROGRESS REPORTING

- (a) **Pre-work Conference.** Within ten (10) days after execution of this Agreement, Contractor shall schedule a pre-work conference with the City's Project Manager to discuss scheduling and other matters. Contractor shall provide a work plan for the City's approval not fewer than five (5) days prior to the pre-work conference. The City shall have ten (10) days to review the work plan. Not less than five (5) days prior to the pre-work conference, Contractor shall provide the City a list of each subcontract exceeding ten percent (10%) of the Total Compensation. The list shall include: (1) name, address, contract, phone number and email address of subcontractor, (2) description of subcontract work, and (3) estimated value of work.
- (b) **Progress Reports.** Contractor shall provide to the City the project schedule and update/status reports as provided in the Scope of Work. Reports will provide detail on progress of the Work and outline any potential issues affecting completion or the overall schedule. Reports may be submitted in any form agreed to by City's Project Manager and Contractor, and may include emails, memos, and letters.
- (c) **Daily Reporting.** The City may require Contractor to provide a daily report regarding the progress of the Work. The need for a daily report shall be determined at the pre-work conference. If required, a form shall be completed for each day any Work is performed until the project is accepted by the City. Completed forms shall be submitted to the City's Project Manager or other authorized representative by 9:00 a.m. of the following day.
- (d) **Progress Meetings.** The City may elect to conduct on-site progress meetings with Contractor on a frequency to be determined by the City. In such event, Contractor shall make available its Project Manager and/or superintendent and other appropriate personnel to discuss matters pertinent to the Work.
- (e) **Failure to Meet Schedule.** If progress of the Work falls five percent (5%) or more behind schedule, except as a result of City-approved delays, Contractor shall take all necessary steps to augment the work effort to get the project back on schedule. Should the progress of the Work fall ten percent (10%) or more behind schedule, the City may advise Contractor through a "cure" notice that this Agreement is subject to termination for cause if the failure is not cured within the time frame specified in said notice.

16. FORCE MAJEURE; DELAYS

- (a) **Force Majeure.** Contractor shall not be liable for failure to carry out the terms of this Agreement to the extent such failure is due to a Force Majeure event, except for failures that could have been reasonably foreseen and guarded against so as to avoid or reduce the adverse impact thereof. A Force Majeure event is hereby defined as the failure to carry out any of the terms of this Agreement due to any one of the following circumstances beyond the control of Contractor: (a) the operation and effect of rules, regulations, or orders promulgated by any commission, county, municipality, or governmental agency of the State of Florida or the United States, (b) a restraining order, injunction, or similar decree of any court of competent jurisdiction, (c) war, (d) flood, (e) earthquake, (f) fire, (g) severe wind storm, (h) acts of public disturbance, (i) quarantine restrictions, (j) epidemics, (k) strikes, (l) freight embargoes, or (m) sabotage. The times specified herein for performances include delays that can ordinarily be anticipated due to adverse weather conditions. The City is not obligated to grant an extension of time due to adverse weather conditions unless

such conditions rise to the level of Force Majeure.

- (b) **Delay.** Contractor shall not be compensated for delays caused by Contractor's inefficiency, rework made necessary by Contractor's error, failure to perform the Work as scheduled, or any other corrective or productivity measures made necessary by errors, omissions, or failures to properly perform the Work. Neither shall the Contractor be compensated for delays caused by events by force majeure as described in sub-para (a) above. Within ten (10) days after the onset of a delay, Contractor shall notify the City in writing of the delay, which shall provide: (1) a detailed description the delay and its probable duration, (2) the specified portion of the Work affected, and (3) an opinion as to the cause of the delay and liability (if any) for the delay. Notices provided more than ten (10) days after the inception of the delay shall only be effective as to additional time incurred during the ten (10) day period preceding receipt of such notice. In the case of continuing cause delay for the same cause, only one notice of delay is necessary. **Failure to provide this notice waives any claim for extension of time resulting from such delay.** If the delay is due to the failure of another City contractor to complete its work in a timely manner, changes ordered in the Work, a Force Majeure event, or any other cause which the City, in its sole judgment and discretion, determines to justify the delay, then the Completion Date may be extended as necessary to compensate for the delay. All time extensions shall be in the form of a written amendment signed by both parties.

17. MODIFICATION OF SPECIFICATIONS; CHANGE ORDERS; EMERGENCY CHANGES IN WORK

- (a) **Modification of Specifications.** No oral agreement or conversation with any officer, agent, or employee of the City after execution of this Agreement shall affect or modify any of its terms. No one is authorized to change any provision of the specifications without written authorization of the City. The presence or absence of a City inspector shall not relieve Contractor from any requirements of this Agreement.
- (b) **Change Orders**
 - (i) The City may alter, add to, or deduct from the Work by executing a Change Order without liability to Contractor, except for the reasonable cost of any additional Work. All such Work within Contractor's capacity to perform shall be performed pursuant to the Change Order. Any associated claim for extension of time will be adjusted when the Change Order is issued. The parties shall negotiate the cost of the Change Order on an equitable basis, which may be determined in one or more of the following ways: (1) estimate and acceptance of a lump sum, (2) unit prices named in the contract or subsequently agreed upon, (3) costs and percentage or by (4) cost and a fixed fee. If the parties cannot agree upon cost, Contractor shall implement the Change Order and shall maintain and present in such form as the City Project Manager may direct the correct amount of the net cost of labor and materials, together with vouchers. The Project Manager will certify the amount due Contractor, including reasonable allowances for overhead and profit. Pending a final determination of value, payments will be based upon the City Project Manager's certification. Final resolution of the amount due to Contractor shall be pursuant to the dispute resolution procedure.
 - (ii) For any Change Order requests submitted by Contractor, the City may determine that City instructions to correct deficient Work, to stop the Work due to

deficiencies in the Work, or any other matters that impose additional costs upon Contractor, do not warrant an increase in the Total Compensation or extension of the Completion Date. If Contractor disputes this determination, final resolution shall be pursuant to the dispute resolution procedure.

- (c) **Emergency Changes in Work.** In the event an emergency endangering life or property requires immediate action, the City may give Contractor an oral instruction to proceed with an emergency change in the Work, which will be confirmed in writing within five (5) days. Within fifteen (15) days after commencement of the emergency change in the Work, Contractor shall provide the City with a written estimate of any increased costs or delays as a result thereof. **Failure to so notify the City constitutes a waiver of any right to an extension of time or increase in compensation.** Within fifteen (15) days after receipt of Contractor's estimate, the parties shall negotiate a Change Order. If unable to reach agreement, disputed issues shall be resolved pursuant to the dispute resolution procedure. In no event shall Contractor decline to perform the emergency change in the Work.

18. TERMINATION AND SUSPENSION

- (a) **City Termination for Cause.** The Agreement may be terminated by the City for cause in the event of any breach hereof, including, but not limited to, Contractor's: (1) failing to carry forward and complete the Work as provided herein; (2) failing to comply with applicable laws, regulations, permits, or ordinances; (3) failing to timely correct defective Work; (4) making a general assignment for the benefit of its creditors; (5) having a receiver appointed because of insolvency; (6) filing bankruptcy or having a petition for involuntary bankruptcy filed against it; (7) failing to make payments when due to subcontractors, vendors, or others for materials or labor used in the Work; (8) making a material misrepresentation to the City regarding the Work, or (9) any other material breach of this Agreement. In such event, the City shall provide Contractor with written notice of its intention to terminate this Agreement, stating the nature of the deficiency and the effective date of termination. At the City's sole judgment and discretion, the City may afford Contractor an opportunity to cure said deficiency, in which event the notice shall specify the time allowed. Upon termination, the City may take possession of the premises and of all materials thereon and finish the Work by whatever means it deems expedient. In such event, Contractor shall not receive any further payment until the Work is completed by the City. Contractor shall be liable for all costs involved in completing the Work, including additional managerial and administrative services, which shall be offset against any amount due to Contractor.
- (b) **City Termination for Convenience.** Notwithstanding any other provision hereof, the City may at any time terminate this Agreement or any Work issued under it, in whole or in part, without cause, upon thirty (30) days written notice to Contractor. In such event, Contractor shall be compensated for any Work performed prior to the date of termination and for materials that were ordered prior to receipt of notice of termination that cannot be returned to the vendor, which shall become City property. Upon receipt of notice, Contractor shall discontinue the Work on the date and to the extent specified therein and shall place no further orders for materials, equipment, services, or facilities, except as needed to continue any portion of the Work not terminated. Contractor shall also make every reasonable effort to cancel, upon terms satisfactory to the City, all orders or subcontracts related to the terminated Work. Contractor may not claim any compensation not specifically provided for herein, including, but not limited to: loss of anticipated profits; idle equipment, labor, and facilities; any additional claims of subcontractors and vendors.

- (c) **City Suspension for Cause.** The City may issue a written partial or full Stop Work Notice in the event Contractor fails to comply with or is negligent in performing any provision hereof. All performance shall immediately cease as per such notice and no further billable costs shall be incurred. The City may terminate this Agreement if Contractor fails or refuses to comply with a Stop Work Notice.
 - (d) **City Suspension for Convenience.** The City may direct Contractor to stop Work, in whole or in part, whenever, in the City's sole judgment and discretion, such stoppage is necessary to ensure proper completion of the Work, avoid injury to third persons, or otherwise meet the City's objectives. The City shall provide Contractor not fewer than five (5) days written notice, except in emergency circumstances. Contractor shall immediately comply with such notice. Should such stoppage increase Contractor's cost, an equitable adjustment will be made by Change Order. The notice shall be effective until rescinded in writing, unless the period of suspension is stated in the notice.
 - (e) **Contractor's Right to Stop Work or Terminate Agreement**
 - (i) **Stop Work.** Contractor may stop work only under the following circumstances: (1) the Work is ordered temporarily discontinued by a court or other public authority; (2) it is necessary to stop work in order to protect the safety of Contractor or third persons; or (3) the City fails to pay Contractor when due any undisputed and adequately documented sum certified for payment by the City Project Manager. In such event, Contractor shall provide the City not fewer than seven (7) days prior written notice of its intention to stop work, except in emergency circumstances or when necessary to prevent injury to persons or property.
 - (ii) **Termination.** Contractor may terminate this Agreement under only the following circumstances: (1) the Work is ordered discontinued by a court or other public authority, through no act or fault of Contractor, for a period of not fewer than three months; (2) the City fails to pay Contractor when due any undisputed and adequately documented sum certified for payment by the City Project Manager. In such event, Contractor shall provide not fewer than twenty (20) days written notice of its intention to terminate and afford the City the opportunity to cure said deficiency within said time period.
 - (iii) **Duty to Perform.** Except as expressly provided above, in the event of any event, dispute, or other matter arising under this Agreement, Contractor shall fully perform the Work in accordance with the City's written instructions and may claim additional compensation as a Change Order, subject to the dispute resolution procedure.
19. **PROTECTION OF WORK.** Contractor shall protect and prevent damage to all finished and unfinished portions of the Work including, but not limited to, the protection of the same from damage by the elements, theft or vandalism. Restoration of such damage shall be the sole responsibility of Contractor and shall not be cause for an increase in the Contract Consideration nor any extension of the Term.
20. **TRENCH SAFETY.** In the performance of this contract, Contractor may be requested to supply cost estimates for trench excavation to a depth exceeding five feet. Section 553.62, F.S., incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR s. 1926.650 Subpart P, as the standard. Contractor shall separately estimate the cost of

compliance with those standards as required by Section 553.63, F.S. Such estimate shall be based on the linear feet of trench to be excavated and shall include written assurance of compliance with those standards and any applicable special shoring requirements.

21. **NO ASSIGNMENT.** The Contractor may not assign this Contract without the advance written approval of the City. For the purposes of this paragraph, assignment shall be interpreted to include any transfer of more than fifty (50%) percent of the ownership interests of the Contractor whether or not the Contractor is a sole proprietorship, partnership, corporation, limited liability company, limited partnership or any other business, organization or entity.
22. **COMPLIANCE WITH PUBLIC RECORDS ACT**

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

Telephone:	(904) 825-1007
Email:	recordsrequest@citystaug.com
Mailing Address:	City of St. Augustine Darlene Galambos, City Clerk Public Records Custodian P.O. Box 210 St. Augustine, Florida 32085-0210

Pursuant to Chapter 119, Florida Statutes, the Contractor shall comply with the provisions of the Florida Public Records Act, specifically to:

1. Keep and maintain public records required by the City to perform the Work.
2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the contractor does not transfer the records to the City.
4. Upon completion of the contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.
5. A request to inspect or copy public records relating to the City's contract for services must be made directly to the City. If the City does not possess the requested records, the City shall immediately notify the Contractor of the request, and the Contractor must provide the

- records to the City or allow the records to be inspected or copied within a reasonable time.
6. If the Contractor does not comply with the City's public records request for records, the City shall consider such noncompliance a material default of the terms of the contract and shall seek such remedies for such default as provided in the contract or at law.
 7. A contractor who fails to provide the public records to the City within a reasonable time may be subject to penalties under F.S. 119.10.

23. **NO WAIVER OF SOVEREIGN IMMUNITY.** Nothing in this agreement shall be construed as a waiver of sovereign immunity beyond that provided in Section 768.28, F.S., nor shall anything in this Agreement be construed as increasing the limits of the sovereign immunity of the City as provided in Section 768.28, F.S.

24. **ACCESS; WORK AREA; GATES**

- (a) **Access.** The City will provide sufficient access to accomplish Work performed on City property. Contractor shall maintain all on-site roadways and paved and unpaved access roadways to and from the worksite in an acceptable and passable condition at no additional cost to the City, and shall, upon conclusion of the Work, return said roadways to City in their original condition. Land access to construction sites is restricted to the route designated by the City. Contractor is responsible for improvements and repairs to access routes required during construction. All access routes shall be used for the purpose of construction only. Contractor shall not disturb lands or waters outside the area of construction, except as may be found necessary and authorized by the City.
- (b) **Work Area.** All Work shall be confined to the designated work area(s). Contractor shall obtain written approval from the City before making any adjustments.

25. **ASSIGNMENT AND SUBCONTRACTS**

- (a) Contractor shall not sublet, assign, or transfer any Work involving more than fifteen percent (15%) of the total cost of the Work, or assign any monies due hereunder, without the City's prior written consent. As soon as practicable after signing this Agreement, but not fewer than seven (7) business days prior to the effective date of any subcontracts, Contractor shall notify the City's Project Manager in writing of the name of any subcontractor that has not been previously disclosed in the procurement process. Within five (5) business days, after the City receipt of said notification, the City shall indicate its approval or disapproval, which shall not be unreasonably withheld. Failure to timely provide such approval or disapproval shall constitute approval. Neither City approval of a subcontractor nor any other provision of this Agreement creates a contractual relationship between any subcontractor and the City. Contractor shall be allowed a maximum 10% markup of their subcontractor's work for oversight and management.
- (b) Contractor is responsible for fulfilling all work elements in any subcontracts and payment of all monies due. Contractor is fully responsible to the City for the acts and omissions of its subcontractors and persons directly or indirectly employed by them and shall hold the City harmless from any liability or damages resulting from any subcontract to the extent allowed by law.

26. **AUDIT; ACCESS TO RECORDS.** Until the expiration of three (3) years after expenditure of funds hereunder, the City or its duly authorized representatives shall have access to examine any

of Contractor's books and other records involving transactions related to this Agreement. Contractor shall preserve all such records for a period of not fewer than three (3) years. Contractor shall refund any payment(s) that are found to not constitute allowable costs based upon audit examination. All required records shall be maintained until an audit has been completed and all questions arising from it are resolved. Contractor will provide proper facilities for access to and inspection of all required records.

27. BONDS

Pursuant to Chapter 255.05 F.S., prior to commencing the work, the Selected Contractor shall execute and record in the public records of St. Johns County a payment and performance bond with a surety insurer authorized to do business in the State of Florida. A certified copy of the recorded bond shall be provided to the City prior to commencement of the work.

- (a) Payment Bond. A payment bond equal to the Total Compensation is required for fixed price contracts and fixed price Work Orders greater than \$100,000; provided, however, that the bond may be reduced by the City, in its sole judgment and discretion, to that amount necessary to ensure payment of all subcontractors and materialmen. The City may require, in its sole judgment and discretion, a payment bond for fixed price contracts and Work Orders of \$100,000 or less in which event the bonding requirement shall be disclosed in the Invitation for Bids or Work Order specifications.
- (b) Performance Bond. A performance bond equal to one hundred twenty-five percent (125%) of the Total Compensation is required for fixed price contracts and Work Orders greater than \$100,000. The City may require, in its sole judgment and discretion, a performance bond for fixed price contracts and Work Orders of \$100,000 or less in which event the bonding requirement shall be disclosed in the Invitation for Bids or Work Order specifications.
- (c) Completed bonds shall be delivered to and accepted by the City prior to commencement of the Work. Bond premiums shall be paid by Contractor. Bonds shall be (1) either in the reproduced form provided in the Bid Documents or in a form approved by the City, and (2) written through a licensed agency that fulfills the requirements of Section 287.0935, F.S.
- (d) **Qualification-Management and Strength.** The Surety executing a bond must be rated no less than "Excellent" for both financial strength and issuer credit, with a rating outlook of stable or positive for both, and must have a financial size rating of VII or better according to the latest information available from A.M. Best Company, Inc.'s rating and analysis web site.
- (e) In lieu of the bond, a Contractor may submit an alternative form of security in the form of cash, money order, certified check, cashier's check, irrevocable letter of credit, or other security acceptable to the City.

28. **CIVIL RIGHTS.** Pursuant to Chapter 760, F.S., Contractor shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin, age, handicap, or marital status.

29. **CLEANUP; EQUIPMENT REMOVAL.** Upon expiration or termination of this Agreement, Contractor shall restore the worksite to its original condition, except for replacement of

vegetation, unless otherwise required by this Agreement. Contractor shall remove from City property and all public and private property all machinery, equipment, supplies, surplus materials, temporary structures, rubbish, and waste materials resulting from its activities. After twenty (20) days, the City may sell or dispose of any materials left at the worksite as it sees fit and deduct the cost of sale or disposal from any amounts due to Contractor. Any revenues obtained shall be applied toward costs incurred by the City, with excess revenues paid to Contractor.

30. COORDINATION WITH THE CITY AND OTHER CITY CONTRACTORS

- (a) The City may let other contracts in connection with the Work. Wherever work done by the City or another City contractor is contiguous to Contractor's Work, the respective rights of the various interests shall be established by the City so as to secure completion of the Work. Contractor shall arrange its Work so as not to interfere with the City or other City contractors and join its Work to that of others in a proper manner, and in accordance with the intent of the Scope of Work. Contractor shall perform its Work in the proper sequence in relation to that of other City contractors, as may be directed by the City. Contractor shall afford other City contractors' reasonable opportunity for introduction and storage of their materials and execution of their work and shall properly conduct and coordinate its Work with theirs. Contractor shall take into account all contingent work to be done by others and shall not plead its want of knowledge of such contingent work as a basis for delay or non-performance. Contractor shall be liable for any damage it causes to the work performed by other City contractors.
- (b) If any part of the Work depends for proper execution or results upon the work of other City contractors, Contractor shall inspect and promptly report any defects in the other contractor's work that render it unsuitable for Contractor's Work. **Failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of its Work, except as to defects which may develop in the other contractor's work after execution of the Work.**

31. CORRELATION AND INTENT OF DOCUMENTS; QUESTIONS OR ISSUES REGARDING PERFORMANCE OF THE WORK

- (a) This Agreement and all attachments are complementary. What is called for by one is as binding as if called for by all. The intent is to include all labor and materials, equipment, transportation, and incidentals necessary for the proper and complete execution of the Work. Materials or work described in words, which so applied have a well-known technical or trade meaning, shall be held to refer to such recognized standards.
- (b) It is the City's intention to fully assist Contractor in the successful performance of the Work and to respond in a timely manner to questions or issues that arise. Contractor should discuss any questions or issues with the City's Project Manager and communicate such questions or issues in writing when required by this Agreement. The City shall respond through its Project Manager.

32. DISPUTE RESOLUTION.

- (a) **During the course of work.** In the event any dispute arises during the course of the Work, Contractor shall fully perform the Work in accordance with the City's written instructions and may claim additional compensation. Contractor is under a duty to seek clarification and resolution of any issue, discrepancy, or dispute by submitting a formal request for

additional compensation, schedule adjustment, or other dispute resolution to the City's Project Manager no later than fifteen (15) calendar days after the precipitating event. If not resolved by the Project Manager within five (5) business days, the Project Manager shall forward the request to the Office of the City Manager, which shall issue a written decision within fifteen (15) calendar days of receipt. This determination shall constitute final action of the City and shall then be subject to judicial review upon completion of the Work. **Contractor shall proceed with the Work in accordance with said determination. This shall not waive Contractor's position regarding the matter in dispute.**

- (b) **Invoices.** In the event the City rejects an invoice as improper, and the Contractor declines to modify the invoice, the Contractor must notify the City in writing within ten (10) calendar days of receipt of notice of rejection that the Contractor will not modify the invoice and state the reason(s) therefor. Within five (5) business days of receipt of such notice, if not informally resolved through discussion with the City Project Manager, the Project Manager shall forward the disputed invoice and the Contractor's written response to the Office of the City Manager. The matter shall then proceed as described in subsection (a), above.

- 33. **DIVERSITY REPORTING.** The City is committed to the opportunity for diversity in its procurement activities and encourages its prime vendors (contractors and suppliers) to make a good faith effort to ensure that women and minority-owned business enterprises (W/MBE) are given the opportunity for maximum participation as sub-contractors. The City will assist Contractor by sharing information on W/MBEs. Contractor shall provide with each invoice a report describing the company names for all W/MBEs, the type of minority, and the amount spent with each at all levels. The report will also denote if there were no W/MBE expenditures.

34. **DUTY TO INSPECT AND REPORT DEFICIENCIES IN PLANS AND SPECIFICATIONS**

- (a) For any Work that is dependent upon conditions at the worksite, Contractor's acceptance of contract award represents and warrants that Contractor has inspected and satisfied itself concerning the nature and location of the Work and general and local conditions, including, without limitation: (1) conditions affecting transportation, disposal, handling, and storage of materials; (2) availability and quality of labor; (3) availability and condition of roads; (4) climatic conditions and seasons; (5) hydrology of the terrain; (6) topography and ground surface conditions; (7) nature and quantity of surface materials to be encountered; (8) equipment and facilities needed preliminary to and during the Work; and (9) all other matters that can affect the Work and the cost thereof. Contractor's failure to acquaint itself with such conditions will not relieve it from its responsibility for properly estimating the time required or cost of performing the Work. Where the City has investigated subsurface conditions, this data may be provided to Contractor or is available upon request. Contractor must either seek clarification concerning the data or assume the responsibility for its interpretation.
- (b) If Contractor discovers hidden or subsurface conditions that differ materially from those normally expected or indicated in the technical specifications, Contractor shall immediately, and before such conditions are disturbed, notify the City in writing of: (1) subsurface or latent physical conditions differing materially from those indicated in the technical specifications, or (2) unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for herein. The City shall promptly investigate the conditions and

determine whether they materially differ so as to cause an increase or decrease in Contractor's cost. Where the differing site conditions materially impact Contractor's cost, an equitable adjustment shall be made and the Agreement modified accordingly. No claim will be allowed if Contractor fails to provide the required notice.

- (c) If Contractor in the course of the Work finds any defect in the plans and specifications, including, but not limited to, any discrepancy between the drawings and the physical conditions at the worksite, or any errors or omissions in the drawings or in the layout, as given by points and instructions, it shall immediately inform the City in writing, which shall be promptly verified by the City. Any Work done after such discovery, until authorized, will be done at Contractor's risk as to cost overruns and modifications necessary to correct deficiencies in the Work. To ensure the proper execution of its subsequent Work, Contractor shall measure Work already in place or completed and shall immediately report any discrepancy between the executed Work and the drawings or other specifications.

- 35. **GOVERNING LAW, VENUE, ATTORNEY'S FEES, WAIVER OF RIGHT TO JURY TRIAL.** This Agreement shall be construed according to the laws of Florida and shall not be construed more strictly against one party than against the other because it may have been drafted by one of the parties. As used herein, "shall" is always mandatory. In the event of any legal proceedings arising from or related to this Agreement: (1) venue for any state legal proceedings shall be in a court of competent jurisdiction located in St. Johns County; (2) venue for any federal legal proceeding shall be in the federal court for the Middle District of Florida, Jacksonville Division; (3) each party shall bear its own attorney's fees, including appeals; (4) for civil proceedings, the parties hereby consent to trial by the court and waive the right to jury trial.
- 36. **INTEREST IN THE BUSINESS OF CONTRACTOR; NON-LOBBYING.** Contractor certifies that no officer, agent, or employee of the City has any material interest, as defined in Chapter 112, F.S., either directly or indirectly, in the business of Contractor to be conducted under this Agreement, and that no such person shall have any such interest at any time during the term of this Agreement. Pursuant to Section 216.347, F.S., monies received from the City pursuant to this Agreement shall not be used to lobby the Florida Legislature or any other state agency.
- 37. **INDEPENDENT CONTRACTOR.** Contractor is an independent contractor. Neither Contractor nor Contractor's employees are employees or agents of the City. Contractor controls and directs the means and methods by which the Work is accomplished. Contractor is solely responsible for compliance with all labor, wage and hour and tax laws pertaining to it, its officers, agents, and employees, and shall indemnify and hold the City harmless from any failure to comply with such laws. Contractor's duties include, but not be limited to: (1) providing Workers' Compensation coverage for employees as required by law; (2) hiring employees or subcontractors necessary to perform the Work; (3) providing any and all employment benefits, including, but not limited to, annual leave, sick leave, paid holidays, health insurance, retirement benefits, and disability insurance; (4) payment of all federal, state and local taxes, income or employment taxes, and, if Contractor is not a corporation, self-employment (Social Security) taxes; (5) compliance with the Fair Labor Standards Act, 29 U.S.C. §§ 201, et seq., including payment of overtime as required by said Act; and (6) providing employee training, office or other facilities, equipment and materials for all functions necessary to perform the Work. In the event the City provides training, equipment, materials, or facilities to meet specific City needs or otherwise facilitate performance of the Work, this shall not affect Contractor's duties hereunder or alter Contractor's status as an independent contractor. This paragraph does not create an affirmative obligation to provide any employee benefits not required by law.

38. **INSPECTION AND TESTING OF WORK; REJECTION OF WORK AND MATERIALS; TOOLS, PLANT, AND EQUIPMENT; MATERIAL SUBSTITUTION**

- (a) **Standards for Quality and Workmanship.** All materials, equipment, and supplies furnished by Contractor for permanent incorporation into the Work shall be new and of the quality standards specified. Unless otherwise specified, all material and workmanship shall meet the requirements in the applicable standards specifications of the American Society for Testing and Materials. If two or more brands, makes of material, devices, or equipment are shown or specified, each should be regarded as the equal of the other. First-calls and the finished product shall be equal to the best-accepted standards of the trade class. The finished product shall be equal to the best-accepted standards of the trade for the category of Work performed. The City's intent is to obtain a high-quality job that will operate and function with the lowest possible maintenance costs. Inspection standards will be established to ensure that this objective is achieved.
- (b) **Materials and Equipment Schedules.** The City shall have the right of prior approval for all materials or equipment incorporated into the Work. Within ten (10) days after the date of contract award and before any material or equipment is purchased, Contractor shall submit to the City's Project Manager a complete list of materials or equipment to be incorporated into the Work. The list shall include catalog cuts, diagrams, drawings, and such other descriptive data as may be required. The use of materials or equipment not in accordance with this Agreement may be rejected.
- (c) **Inspection.** The Work and all materials or equipment used therefor are subject to inspection by the City at all times in order to ensure compliance herewith. Upon request, Contractor shall provide samples of the type and quantity of the various materials used in the Work, as determined and directed by the City. The City's Project Manager and inspector(s) shall be provided access to the Work wherever it is in preparation or progress. Contractor shall provide proper facilities for such access and inspection. Construction contractors shall maintain one complete copy of the drawings and specifications for the Work at the worksite, which shall be made available to the City upon request.
- (d) **Re-examination of Work.** The City may order re-examination of questioned Work and, if so ordered, the Work shall be uncovered by Contractor. If such Work is found to be in accordance with specifications, the City will pay the cost of re-examination and replacement. If such Work is found to be not in accordance with specifications, Contractor will pay such cost.
- (e) **Testing.**
 - (i) The City may require that materials be tested prior to incorporation in the Work. In some instances, it may be expedient to make these tests at the source of supply. Therefore, upon request, Contractor shall furnish the City with information identifying the source of supply before incorporating material into the Work. Upon request, Contractor shall furnish two (2) copies of the manufacturer's certificate of compliance with these specifications covering manufactured items. All tests performed by a laboratory to ascertain whether the material, as placed, meets the required specification will be paid for by Contractor. This paragraph does not obligate the City to perform tests for acceptance of material or relieve Contractor of its responsibility to furnish satisfactory material.

- (ii) If the specifications, the City's instructions, laws, ordinances, or any public authority require any Work to be specifically tested or approved, Contractor shall give the City's Project Manager timely notice of its readiness for inspection. If inspection is by an authority other than the City's Project Manager, Contractor's Project Manager shall supply the City's Project Manager with 72 hours prior notice of such inspection. Inspections by the City's Project Manager will be made promptly and, where practicable, at the source of supply. If any Work should be covered up without the prior approval of the City's Project Manager, it shall, if required by the City, be uncovered for examination at Contractor's expense.
 - (f) **Rejection of Work and Materials.** Contractor shall promptly notify the City of any defective material and shall not incorporate such material into the Work. The City may reject all Work and material that does not conform to this Agreement, which shall be removed and replaced with approved quality material at no additional cost to the City. If the City deems any portion of the Work unsatisfactory, Contractor shall rework those areas so that the total Work is completed in a manner satisfactory to the City. If disputed, Contractor may submit a Change Order, subject to the dispute resolution procedure.
 - (g) **Tools, Plant, and Equipment.** If at any time before commencement of or during progress of the Work, tools, plant, or equipment appear to the City to be insufficient, inefficient, or inappropriate to secure the quality of Work or the proper rate of progress, the City may order Contractor to increase its efficiency, to improve its character, or to augment the number of or substitute new tools, plant, or equipment, as the case may be. Contractor shall conform to such order. If Contractor maintains that any such order is not in conformance with this Agreement, is unnecessary, or requires Contractor to incur excessive costs or delays, Contractor may submit a Change Order, subject to the dispute resolution procedure. Failure of the City to make such demand shall not relieve Contractor of its obligation to secure the quality of the Work and the rate of progress necessary to timely complete the Work.
 - (h) **Material substitution.** Except where otherwise indicated, whenever a material or a piece of equipment required in the Work is shown in the specifications by using the name of the proprietary product or that of a particular manufacturer or vendor, any material, equipment, device, or article that will in the City's opinion at least equally perform the same duties imposed by the general design, considering quality, workmanship, economy of operation, and suitability for the purpose intended, may be considered "equal" and substituted for the material or piece of equipment originally specified. In the event Contractor desires the City to consider an item for substitution, Contractor shall submit a written request, which shall give all pertinent details and comparisons of the substitute with the item specified. The City will notify Contractor in writing of its acceptance or rejection. In all cases, new material shall be used. Contractor shall pay all costs resulting from inspection or testing of materials or equipment proposed for substitution.
39. **LAND AND WATER RESOURCES.** Contractor shall not discharge or permit the discharge, directly or indirectly, of any fuels, oils, calcium chloride, acids, insecticides, herbicides, wastes, toxic or hazardous substances, or other pollutants or harmful materials, onto any lands or into any surface or ground waters, including, but not limited to, streams, lakes, rivers, canals, ditches, or reservoirs. Contractor shall investigate and comply with all applicable federal, state, county, and municipal laws concerning toxic wastes, hazardous substances, and pollution of surface and ground waters. If any waste, toxic or hazardous substance, or other material that can cause pollution, as defined in Section 403.031, F.S., is dumped or spilled in unauthorized areas,

Contractor shall notify the City thereof within one (1) workday and thereafter shall remove the material and restore the area to its original condition. If necessary, contaminated ground shall be excavated and disposed of as directed by the City and replaced with suitable fill material, compacted and finished with topsoil, and planted as required to re-establish vegetation. All cleanup and disposal costs shall be borne by Contractor.

40. **LIENS.** Acknowledging that the City's property is not subject to liens, neither final payment nor payment of any part of the retainage shall become due until Contractor delivers to the City releases of all labor and material cost liens arising from Contractor's performance of the Work, including Contractor and any subcontractor(s), and an affidavit by Contractor stating that the releases and receipts include all labor and material costs for which a lien could be filed. If any subcontractor refuses to furnish Contractor a release or a receipt in full, Contractor may furnish to the City a bond satisfactory to the City, indemnifying the City against any such potential lien. If any lien or potential lien remains unsatisfied, the City may discharge the same forthwith and deduct the cost thereof from any amounts due to Contractor. In the event Contractor has been fully paid or the amount of such lien exceeds the amount due to Contractor, Contractor shall refund to the City all monies that the City paid in discharging such lien, including all costs and a reasonable attorney's fee. The discharging of such a lien by the City shall not constitute a waiver of any claims or defenses that Contractor may have against the lienor.
41. **NUISANCE.** Contractor shall exercise every reasonable means to avoid creating or continuing a public or private nuisance resulting from the Work, including, but not limited to: (1) excessive noise associated with radio or other forms of electronic entertainment for persons at the worksite; (2) dust from construction operations, and (3) the uncontrolled flow of surface waters.
42. **PERMITS AND LICENSES; COMPLIANCE WITH LAW.** Contractor shall comply with all applicable federal, state and local laws and regulations, including those pertaining to wages, health and safety. Contractor shall include this requirement in all subcontracts. All materials used and work performed must conform to the laws of the United States, the State of Florida and county and municipal ordinances. Contractor represents and warrants that it is duly licensed to perform the Work in accordance with the laws of the State of Florida and the county or municipality in which the Work is to be performed. For out-of-state contractors, Contractor warrants that it is authorized to do business within the state of Florida and registered with the Secretary of State. Unless otherwise provided in the Statement of Work, the responsibility of the parties for obtaining permits is apportioned as follows:
- (a) The City shall procure all permits required from the Florida Department of Environmental Protection, the U.S. Environmental Protection Agency, and the U.S. Army Corps of Engineers.
 - (b) Contractor shall procure any permits required by the county or municipality wherein the Work is located.
 - (c) Contractor shall: (i) give to the proper authorities all required notices relative to the Work; (ii) obtain and pay for all official permits and any professional or other licenses, code stamps, and inspections that are Contractor's responsibility; and (iii) furnish any bonds, security, or deposits required to permit performance of the Work; (iv) until the Work is accepted as substantially complete, comply with all conditions of governmental permits; and (v) resolve any issues resulting from a finding of noncompliance by any governmental agencies, including all costs for delays, litigation, fines, or other costs.
43. **PETROLEUM STORAGE TANKS.** Any petroleum storage tanks with a capacity of 55 gallons or greater that Contractor brings onto City property must be either double-walled or kept within

secondary containment that will contain 110% of the tank volume.

44. PROTECTION OF THE WORK, CITY EQUIPMENT, AND PROPERTY.

Contractor is responsible for the proper care of the Work and protecting the Work from damage until final acceptance by the City, whether or not the same has been covered by partial payments. Contractor is solely responsible for all City-owned equipment in its possession, if any. Contractor shall adequately protect and maintain all passageways, guard fences, lights, and other facilities as required by public authority or local conditions. Contractor shall conduct the Work so as to minimize damage to existing improvements, and shall restore, as nearly as practical, to its original condition, any such improvements damaged by its operations. In the event of temporary suspension of the Work, or during inclement weather, or whenever the City shall direct, Contractor shall carefully protect the Work from damage. If any Work is damaged due to Contractor's failure to so protect the Work, the loss shall be remedied at Contractor's expense. Contractor shall protect public and privately-owned property, structures, utilities, and work of any kind against damage or interruptions of service resulting from its activities. Contractor shall repair, replace, or restore any damage or loss to any public or private property to the City's satisfaction. Should Contractor fail to perform these obligations, the City may make good any such damage and deduct the cost thereof from Contractor's final payment.

45. PUBLIC ENTITY CRIME. A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity in excess of the threshold amount provided in s. 287.017 F.S., for CATEGORY TWO (\$35,000) for a period of 36 months following the date of being placed on the convicted vendor list.

46. RELEASE OF INFORMATION. Contractor shall not publish or release any information related to performance of this Agreement, or prepare, publish, or release any news or press release in any way related to this Agreement, without prior City review and written consent.

47. REMEDIES FOR NON-PERFORMANCE

- (a) **City Remedies.** The remedies enumerated herein are non-exclusive. In addition to the remedies set forth below, the City may avail itself of any statutory and/or common law remedies not set forth herein. In the event of a breach, the City may terminate this Agreement for cause. Alternatively, the City may allow Contractor to correct the deficiency, or may take such action as is necessary to correct such deficiency through City action or that of a third party. Delay or failure by the City to enforce any right or remedy hereunder shall not impair, or be deemed a waiver of, any such right or remedy, or impair the City's rights or remedies for any subsequent breach of this Agreement.
- (b) **Contractor Correction of Deficiencies.** The City shall provide Contractor with written notice of deficiency. At the City's sole judgment and discretion, the City may afford an opportunity to correct said deficiency, in which event the notice shall specify the time allowed to cure. If Contractor disputes that a failure of performance has occurred, Contractor shall, nevertheless, perform the corrective action and may submit a request for a Change Order subject to the dispute resolution procedure. Unless authorized through a Change Order, the Completion Date shall not be extended in order to correct deficiencies.

Contractor shall bear the cost of correcting all work of other contractors that is destroyed, damaged, or otherwise negatively impacted by its corrective action. Failure to take timely corrective action may result in termination for cause or the City pursuing alternative remedies, as provided herein.

- (c) **Alternative Remedies to Correct Deficiency.** If the City determines that it is not in its best interest for Contractor to correct incomplete or damaged Work caused by Contractor's failure of performance, the City may pursue any or all of the following remedies, in whole or in part: (1) accept the Work as is and deduct the reasonable value of the deficient Work from the Total Compensation; (2) complete the Work through the utilization of City employees and deduct the cost thereof from the Total Compensation; (3) contract with a third party to complete the deficient Work and deduct the cost thereof from the Total Compensation.
- (d) **City Technical Assistance.** The City may elect to provide technical assistance to Contractor in order to complete satisfactory performance of the Work. If the City is performing a function that Contractor is required to perform, the City may deduct the cost of providing such technical assistance from the Total Compensation. Prior to providing any such technical assistance, the City shall notify Contractor that it considers such assistance to be above and beyond its duties under this Agreement and that it intends to deduct the cost of providing such assistance from the Total Compensation. Contractor shall not be entitled to reject technical assistance when the City determines that such assistance is necessary to complete the Work.

- 48. **ROYALTIES AND PATENTS.** Contractor certifies that, to the best of its information and belief, the Work does not infringe on any patent rights. Unless provided otherwise herein, Contractor shall: (1) pay all royalties, patent, and license fees necessary for the Work; (2) defend all suits or claims for infringement of any patent rights, and (3) save and hold the City harmless from loss on account thereof; provided, however, that the City shall be responsible for any such losses when the utilization of a particular process or product of a particular manufacturer is specified by the City. If Contractor obtains information that the process or article so specified is a patent infringement, it shall be responsible for such loss unless it promptly so notifies the City.
- 49. **SAFETY.** For any Work that is to be performed on premises that are owned or controlled by the City (the Premises), Contractor has the sole and exclusive duty for the safety of the premises. Contractor shall provide and maintain sufficient protection for the safety of its employees and other persons who may utilize the Premises, and prevent damage to City property, materials, and equipment. Contractor shall at all times enforce strict discipline and good order among its employees and shall not employ any unfit person or anyone not skilled in the work assigned. Neither Contractor nor its subcontractors shall allow or cause to be allowed any hunting or any weapons, animals, alcohol, or drugs, on or from the Premises or adjacent property. Contractor employees shall not park their vehicles or store equipment or materials adjacent to roads where it may be a hazard to traffic. A clear distance of at least 30 feet from the edge of the pavement or right-of-way shall be kept free of any obstacles unless otherwise authorized by the City. Contractor shall ensure that only authorized personnel are allowed on the worksite and shall post notices warning both employees and the public of all safety hazards created by Contractor.
- 50. **SUBSTANTIAL COMPLETION; PUNCH LIST.** Contractor shall notify the City in writing when it considers the Work to be substantially complete. "Substantially complete" is the point when the City can beneficially occupy its property and use the Work for its intended purpose, with only minor items remaining in order for the Work to be fully complete. Within thirty (30) days of receipt

of such notice, the City shall review the Work and determine whether the Work is substantially complete. If the City agrees that the Work is substantially complete, the City shall, within said 30-day period, develop a list of items ("Punch List") required to render the Work complete, satisfactory, and acceptable in all respects. The Punch List shall be delivered to Contractor not later than five (5) days after it is developed. Contractor shall complete the Punch List items by the Completion Date; provided, however, that if the Completion Date is less than thirty (30) days after the date of delivery of the Punch List, the Completion Date shall be extended to thirty (30) days after delivery of the Punch List. Failure to include any corrective work or pending items not yet completed on the Punch List does not alter Contractor's responsibility to complete all construction services required by the Agreement. Upon completion of all Punch List items, Contractor may request payment of any remaining retainage. If the City disputes the completion of any items on the Punch List, it may withhold 150 percent of the estimated cost of completing any such items and shall return the remainder of the retainage to Contractor. Any disputed matters shall be resolved pursuant to the dispute resolution procedure of this Agreement.

51. SURVEYS; PRESERVATION OF MONUMENTS; POINTS AND INSTRUCTIONS

- (a) **Surveys.** When necessary to performance of the Work, unless otherwise provided in the Statement of Work, the City will furnish horizontal and vertical control necessary to lay out the Work, including horizontal reference point(s) and a vertical control benchmark within 200 feet of the site. The City will set the horizontal reference point(s) and vertical control only at the beginning of the job. Contractor is responsible for interim staking during the job and all staking and layout work not otherwise furnished by the City. Contractor shall furnish all construction layout of the Work, including layout, centerline, and grade stakes for access roadways. Contractor shall furnish all personnel, equipment, and materials to make such surveys as are necessary to determine the quantity of Work performed. Field notes and computations for estimates shall be verified by the City's Project Manager as to the quantities estimated.
- (b) **Preservation of Monuments.** Contractor shall maintain and preserve all new and existing benchmarks, monuments, markers, reference points, and stakes established by others and/or the City. Should any of the aforesaid be destroyed or damaged by Contractor, the same shall be replaced by Contractor's licensed land surveyor at no cost to the City. Contractor shall be responsible for the cost of any deficiencies in the Work caused by such loss or disturbance.
- (c) **Points and Instructions.** Contractor shall provide reasonable and necessary opportunities and facilities for setting points and making measurements. Contractor shall not proceed until it has made a timely request to the City for, and has received, such points and instructions as may be necessary as the Work progresses. The Work shall be done in strict conformity with such points and instructions.

52. **USE OF COMPLETED PORTIONS OF THE WORK.** The City shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the fact that the time for completing the entire Work or such portions may not have expired. Such taking of possession and use will not be deemed an acceptance of any Work not completed. If such possession and use increases the cost of or delays the Work, Contractor shall be entitled to a Change Order for extra compensation, or extension of time, as necessary, to offset the effect of such prior possession and use.

53. WARRANTY

- (a) Contractor warrants that the Work, workmanship and material furnished by Contractor shall be new and of specified quality, shall conform to the requirements of this Agreement, shall be free from defects, and shall be free from any security interest, lien, or other encumbrances. This warranty shall remain in effect for a period of twelve (12) months after completion of the Work, unless otherwise specified herein. Any defective Work, workmanship, or material corrected during the warranty period shall be similarly warranted for twelve (12) months following its correction or for such other period as specified herein. The express warranty set forth herein shall not be exclusive and shall not act as a limitation upon any statutory or other warranty of any kind, express or implied, including any implied warranty of merchantability or fitness for a particular purpose.
- (b) In the event of breach of this warranty, Contractor shall take the necessary actions to correct the breach in the most expedient manner as dictated by then-existing circumstances. All costs incidental to the repair, replacement, redesign, and testing incurred as a result thereof, including the removal, replacement, and reinstallation of equipment in place when the Work was started, shall be Contractor's responsibility. Upon written notification of a breach, Contractor shall promptly send the necessary personnel to the project site to assume responsibility for corrective action. Time is of the essence. Contractor shall be afforded necessary and reasonable access to perform warranty work. If Contractor fails to promptly correct the breach, the City may take corrective action without waiving any other rights or remedies it may have, and Contractor shall reimburse the City for all expenses reasonably incurred in performing such corrective action.

54. WORK ORDERS

- (a) The City reserves the right to award Work Orders based on the ability to perform in a timely manner, availability of required equipment, cost of required equipment, past performance on similar work, availability of qualified staff, and other factors deemed critical to the performance of each Work Order. The City may, at its sole discretion, request a "not to exceed" cost for any Work Order as a method of determining award. The City makes no guarantees of any amount of work to be awarded under the Agreement. The City reserves the right to directly purchase and provide to Contractor all or part of the equipment or materials to be incorporated in the Work.
- (b) Contractor shall not proceed with any Work prior to the receipt of a written Work Order and shall commence the Work under each Work Order within fourteen (14) days of receipt, unless an alternate date is stated in the Work Order. All Work shall be done to the satisfaction of the City's Project Manager or Work Order Manager and subject to the other terms of this Agreement. The Contractor must agree to the terms of the Work Order. Commencement of Work pursuant to a Work Order constitutes acceptance of all of the terms and conditions of the Work Order. A representative Work Order is attached as Exhibit C.
- (c) **Type of Work Order.** When services are needed, the City and Contractor shall agree upon the type of Work Order and the specifics of the Work Order.
 - (i) Generally, a time and materials Work Order involves projects where field conditions, environmental or cultural resource preservation issues, subsurface and other physical conditions, or other aspects of the Work cannot be accurately

defined. This often results in work being modified in the field by the City. Identification of the Work involved is typically concept level drawings with minimal details. The Work Order will describe the general nature of the Work, including specific deliverables, if applicable, along with the total number of hours, days, or weeks estimated for each task; the materials to be incorporated into the work, and the total authorized expenditure amount. If deliverables are specified and materials, equipment, or sub-contractors are necessary to complete the Work, the Work Order shall specify the estimated costs thereof. The City must approve the hiring of sub-contractors in order to ensure they are qualified to perform the Work and have been competitively procured. The Contractor is compensated for equipment and labor based upon the unit costs of this Agreement, and “Other Direct Costs” as defined in sub-paragraph (d)(iv), below. Invoices must be documented as to the number of hours worked and equipment and materials used sufficient for City audit in accordance with the unit costs of this Agreement and the Work Order. The City reserves the right to determine the means and methods of performing the Work and supplying materials.

- (ii) A fixed-price Work Order is issued when the extent and cost of the Work is agreed upon. It will describe with specificity the location, quantity, work limits, timeframes, deliverables, progress payments (if any), total cost, and any other matters pertaining to the Work. The fixed price includes all applicable permits, bonds, labor, equipment, supplies, project support, overhead and materials necessary to complete the Work. It is used when the scope of work can be clearly determined, such as when detailed design drawings and/or specifications and supporting documents are available and site conditions are known. It may include a detailed schedule of values, construction schedule, and any other necessary documents.
- (iii) A time and materials with not-to-exceed amount Work Order is utilized when a not-to-exceed cost is agreed upon for a time and materials Work Order. All of the terms of a time and materials Work Order apply, subject to the not-to-exceed amount. In addition, the deliverables must be described with the specificity of a fixed price Work Order.

(d) **Additional Provisions Applicable to Time and Materials and Time and Materials with Not-to-Exceed Work Orders.**

(i) **Additional equipment and services.**

- a. The City may issue a Work Order requiring the use of additional or specialized equipment not identified in the unit costs of the Agreement. The cost of such equipment may be identified separately and included in the specific Work Order to which it applies, or the Agreement may be amended through a Change Order with an amended cost schedule that includes such equipment. If deliverables are specified and sub-contractors are necessary to complete the Work, the Work Order shall specify the costs of the materials, equipment, and sub-contractors.
- b. After a Work Order is issued, the City may require the use of material, equipment and/or subcontracted services not included in the original Work Order. A Change Order will be issued if the cost exceeds the “not to

exceed” amount of the Work Order, or if the additional cost exceeds \$100,000.

- c. If due to an emergency, the City determines that material, equipment and/or subcontracted services that were not included in the original Work Order are required, the City may authorize procurement thereof in a manner that most efficiently and effectively minimizes public risk and economic loss.

- (ii) **Equipment substitution.** No provision hereof prohibits substitution of rented or leased equipment for unit cost equipment under the Agreement, or addition of rented or leased equipment not included in the Work Order or cost estimates, provided any such substitution or addition complies with the competitive procurement provisions of this paragraph and has been approved in advance in writing by the City. Should the Work require the use of individual equipment for longer than 30 days or 30 hours per week, the City may compare equipment weekly or monthly rental rates on the open market with the rates in the Cost Schedule and require Contractor to rent the equipment on the open market if the cost is lower than the Cost Schedule. The City will reimburse Contractor this rental cost (with allowable percentage markup in the Cost Schedule) plus the hourly rate for operator with fuel and operation and maintenance.

(iii) **Other Direct Costs.**

- a. Subject to prior written City approval, the City will reimburse Contractor for materials purchased by Contractor and incorporated into the Work, non-contract equipment, leases/rentals, subcontract work, bonds, and permits obtained by Contractor, including applicable sales tax (“Other Direct Costs”), plus the allowable percentage markup in the Cost Schedule, provided Contractor adheres to the following the competitive procedures:
 - Cost is \$2,500.01 - \$15,000 – three documented quotes – oral, written, or on line; or a written explanation to City Purchasing Manager and approval from the City’s Purchasing Manager for not receiving three quotes.
 - Cost is greater than \$15,000 – at least three written quotes, reviewed and approved by City procurement staff, or a written explanation to and approval from the City’s Purchasing Manager for not receiving three quotes.
 - Documentation of solicitations where cost exceeds \$2,500 shall be submitted with the Contractor’s cost estimate. If a cost exceeds \$15,000, documentation shall include a complete bidders list and the request for quotes that was sent to each prospective bidder.
- b. Temporary facilities and temporary use materials required for erosion control and dewatering operations may be considered as Other Direct Costs upon approval by the City.
- c. Only equipment or materials that are incorporated into the Work and contracted services directly related to the Work qualify for compensation

as Other Direct Costs. Compensation shall not be provided for any other costs associated with the Work not identified on the Cost Schedule or Work Order.

- (iv) The City reserves the right to reject any proposed subcontractors.
- (e) **Invoicing.** In addition to the general provisions in **PAYMENT OF INVOICES**, supporting documentation shall include:
 - (i) **Time and Material Work Orders:** (hourly billing for labor and/or equipment and materials):
 - a. Name of employee and/or type of equipment
 - b. Employee position title/job classification (if applicable)
 - c. Hours worked and/or equipment utilized on a daily basis, as documented by Contractor's Daily Record of Hours, signed by Contractor and City staff (attached hereto as revised by the City from time to time).
 - d. The approved charge rate for each classification of Contractor employee and/or equipment included in Cost Schedule, Attachment ____, and/or the Work Order authorizing the Work. In the absence of an individual rate in the Cost Schedule, the Contractor employee's general classification rate may be utilized.
 - e. If billed for use of equipment not in the Cost Schedule, documentation of prior authorization for equipment used, including cost and estimated quantities.
 - f. Documentation of any required competitive procurement for equipment, subcontractors, or materials.
 - g. Contractor's notarized affidavit shall be provided with the first invoice for those Work Orders not requiring a Payment Bond, stating that payment of subcontractors and materialmen shall be made pursuant to Section 218.735, F.S.
 - h. Proof of payment of subcontractors and materialmen for which Contractor has already received payment from the City. Proof may be in the form of (1) a cancelled check; (2) a receipt marked paid by subcontractor or materialman; (3) a waiver of claim executed by the subcontractor or materialman; (4) Contractor's sworn affidavit that all subcontractors and materialmen for which payment has been received from the City have been paid by the Contractor; or (5) any other form that has been pre-approved in writing by the City. For the final invoice purposes, proof of payment must be submitted not only as to amounts previously paid by the City, but also as to amounts included in the final invoice.
 - i. A copy of the original vendor invoice(s) for Other Direct Costs. Altered or amended vendor invoices shall be rejected. If a vendor's invoice is from a supplier other than the one providing the lowest quote, Contractor shall explain the reason for not using the lowest cost supplier. The City reserves the right to reduce the amount reimbursed if a competitive market analysis clearly demonstrates that the invoice exceeds market value. In no event shall Contractor charge the City for any subcontractor's work that exceeds the approved Cost Schedule.
 - j. Diversity Statement. If W/MBE subcontractors or suppliers are used, provide company names and amount spent with each. If no W/MBE subcontractors or suppliers are used, so indicate.

- k. Contractor may provide a detailed invoice with supporting information, or alternatively, may provide a summary invoice with the information provided from Contractor's payroll or other records as supporting backup material.
 - ii. **Fixed Price Work Orders:**
 - a. Description of the Work that has been completed in accordance with the progress/payment schedule of the Statement of Work for the Work Order.
 - b. Certification that the Work for which payment is requested has been completed in accordance with the Statement of Work for the Work Order, in a format approved by the City Project Manager.
 - c. Proof of payment of subcontractors and materialmen as described above for Type 1 Work Orders.
 - d. Diversity Statement. If W/MBE subcontractors or suppliers are used, provide company names and amount spent with each. If no W/MBE subcontractors or suppliers are used, so indicate.
 - iii. **Time and Materials with Not-to-Exceed Work Orders:**
 - a. Description and certification of completion of the work as described above for Fixed Price Work Orders.
 - b. Hourly billing information for Time and Materials Work Orders, as described above.
 - c. Proof of payment of subcontractors and materialmen as described above for Time and Materials Work Orders.

55. **WORK SCHEDULE.** As per Scope of Work, Section 01001, Item 1.09 – Work Hours.

56. **CONTRACT INTERPRETATION.** In the event of a conflict between the terms of this Agreement and the General Conditions, the term of the General Conditions shall prevail.

57. **ENTIRE AGREEMENT.** The terms of this Agreement supersede any and all prior or contemporaneous understandings, agreements and representations and constitute the final and complete understandings of the parties.

ADDITIONAL PROVISIONS (In Alphabetical Order)

DEFINITIONS

ADDENDA: Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the solicitation or contract documents.

AGREEMENT: The written contract between the City and Contractor covering the Work, which includes all documents attached to this Agreement or incorporated herein by reference. The words “contract” and “Agreement” are synonymous in these documents.

AMENDMENT: Any written change made to the terms and conditions of the Agreement.

BID: The written offer of Respondent (when submitted on the reproduced approved forms) to perform the Work and furnish the necessary materials in accordance with the provisions of this Agreement.

BID BOND: The security furnished with a Bid to guarantee that Respondent will enter into a contract and execute, deliver, and perform all other obligations described in the Invitation for Bids if Contractor receives a Notice of Intent to Award the contract from the City.

CHANGE ORDER: A written agreement of the parties after the Commencement Date to amend this Agreement so as to modify the Scope of Work or the Total Compensation or provide for an extension of time.

COMMENCEMENT DATE: The date upon which the Work is authorized to proceed.

COMPLETION DATE: The date by which the Work is required to be completed.

CONTRACTOR: Contractor, its officers, employees, agents, successors, and assigns.

CONTRACTOR’S PROJECT MANAGER: The individual designated by the Contractor to be responsible for overall coordination, oversight, and management of the Work for Contractor.

CONTRACTOR’S SUPERINTENDENT: Contractor’s representative who is present during the progress of the Work and authorized to receive and fulfill instructions from the Contractor’s Project Manager or the City.

CPM or CRITICAL PATH METHOD: The use of calculated task duration with no regard for probabilities. A path has no float and is the longest path through the project. A critical path encompasses those project activities that are crucial and cannot be shifted, having calculated task duration. They are the important activities driving the project. Float belongs to the City.

DAY: Each day shown on the calendar.

DELIVERABLES: All Work that is to be performed pursuant to the Scope of Work, in whole or in part, including, but not limited to, all equipment or materials that are incorporated within the Work.

CITY: The City of St. Augustine, its Commission, officers, agents, and employees.

CITY'S PROJECT MANAGER: The City employee designated by the City to be responsible for overall coordination, oversight, and management of the Work for the City.

CITY'S SUPPLEMENTAL INSTRUCTION: Instructions issued by the City's Project Manager to make minor changes in the Work not affecting the Total Compensation or the Completion Date, and consistent with the purpose of the Work.

FINAL RELEASE OF LIENS: The instrument that is to be signed by Contractor and submitted to the City upon completion of the Work showing that all bills from subcontractors have been paid.

INSPECTOR: The City's Project Manager or an authorized representative of the City who is assigned to inspect the Work.

PERFORMANCE AND PAYMENT BOND: The security furnished by Contractor and surety in either the form provided or in a form approved by the City as a guarantee that Contractor will perform all of its contractual obligations in accordance with the terms of the Agreement and pay in full all bills and accounts for material, labor, services, and supplies used directly or indirectly in the performing the Work.

PERSON: Any individual, partnership, society, association, joint stock company, corporation, estate, receiver, trustee, assignee, referee, or capacity, whether appointed by a court or others, and any combination of individuals.

PRINCIPAL: When used in a Bid, Performance and Payment Bond, the word "principal" means the same as the word "Contractor."

REQUEST FOR BIDS: An advertised solicitation for sealed competitive Bids, with the title, date, and hour of the public opening designated. It includes a detailed description of the goods and/or services sought, the date for submittal of Bids, and all contractual terms and conditions.

RESPONDENT: Any person who submits a Bid in response to a Request for Bids or a proposal in response to a Request for Proposals.

SCOPE OF WORK: The City's written directions, requirements and technical specifications for completing the Work. Standards for specifying materials or testing that are incorporated therein by reference shall have the same force and effect as if fully set forth therein.

SUBCONTRACTORS: Those persons having a direct contract with Contractor relating to performance of the Work, including one who furnishes material worked into a special design in accordance with the plans or specifications of the Work, but not including one who merely furnishes material.

SURETY: The entity bound by a bond to be liable for Contractor's satisfactory performance of the Work and payment of all debts pertaining thereto.

TOTAL BID: The total cost to be paid to Contractor for completion of the Work.

TOTAL COMPENSATION: The total funds to be expended pursuant to this Agreement upon satisfactory completion of the Work.

WORK: All labor, materials, equipment, transportation, supporting documentation, and other products, services, or facilities necessary for complete performance of the Agreement.

Contract #PW2020-06

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in duplicate, each of which shall be deemed an original on the day and year first above written.

CITY OF ST. AUGUSTINE,
FLORIDA a municipal corporation

ATTEST:

Name:

Darlene Galambos
Darlene Galambos, City Clerk

By:

Meredith Broiden

Printed Name:

Meredith Broidenstein

Title:

Assistant City Manager

Date:

10/7/2020

(SEAL)



Signed, sealed and delivered
in the presence of:

Witness

Jana Lause

Printed Name:

Jana Lause

By:

Diane Partridge

Diane Partridge
Contracting & Attesting Officer

Printed Name:

Title:

Date:

Oct. 5, 2020

Witness

Printed Name:

Janet Hass

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

Isabelle C. Lopez
Isabelle C. Lopez, City Attorney

- Exhibit A: Scope of Work/Technical Specifications
- Exhibit B: Insurance Requirements
- Exhibit C: Work Order Authorization (sample)
- Exhibit D: Unit Price Schedule
- Attachment #1 – Protection of Archeological and Historical Sites
- Attachment #2 – Unexpected Discoveries

EXHIBIT A – SCOPE OF WORK

Section 01001 General Work Requirements

Section 01010 Summary of Work

Section 01101 Special Requirements (Gravity Inspections Only)

Section 01200 Project Meetings

Section 01300 Submittals

Section 01516 Collection Systems Bypass

Section 01570 Maintenance of Traffic

Section 02761 Cleaning Sanitary Sewer Systems

Section 02762 Televising Sanitary Sewer Systems

Section 02763 Televising Sanitary Sewer Laterals

Section 02766 Sanitary Sewer Obstructions Removal

Section 02771 Cure-in-Place Pipe for Sanitary Sewer Renewal

Section 02772 Cure-in-Place Pipe for Lateral Renewal

Section 02773 Service Lateral Clean-outs for Televising Access

Section 02959 Sewer Main and Lateral Connection Sealing By Chemical Grout

SECTION 01001

GENERAL WORK REQUIREMENTS

PART 1 - GENERAL

1.01 REQUIREMENT APPLICATION

- A. The requirements included in this Section apply to Sections 01010, 01101, 01200, 01300, 01516, 01570, 02761, 02762, 02763, 02766, 02771, 02772, 02773, and 02959.
1. Each of these contract Sections apply to every work order regardless of a specific reference.

1.02 MINIMUM CONTRACTOR QUALIFICATIONS

- A. The following requirements shall be met to qualify for the Cleaning, CCTV and CIPP work.
1. Company:
 - a. A minimum total of 500,000 LF of Sanitary Sewer mains shall be previously completed within the previous 8-years.
 - b. A minimum total of 10,000 LF of tuberculation descaling.
 - c. A minimum total of 500 Ea. hammer tap service connections removal.
 - d. A minimum total of 200 Ea. sectional CIPP liners including one piece main/lateral CIPP liners.
 - e. Documented company QA/QC plan and procedures
 2. Company equipment:
 - a. At least one (1) pan and tilt CCTV camera with rotating lights
 - b. At least one (1) push type lateral cameras with footage counter and ability to display footage on screen and/or lateral launch type lateral camera with footage counter and ability to display footage on screen
 - c. Digital video capture system capable of capturing MPEG or Windows Media Video files on board the camera truck
 - d. PACP compliant inspection data logging software
 - e. At least one (1) jetter/vacuum truck
- B. The Contractor's staff experience shall meet as a minimum the following requirements. The inability to document such experience may be grounds for rejecting the proposed installer's staff.
1. The proposed **Superintendent** must have a minimum of three (5) years of CIPP lining supervisory field experience on projects totaling a minimum of 300,000 LF of 8-inch or greater CIPP liner installation using the methods and materials proposed for this Work, as documented by verifiable references. Superintendent's resume of projects. Each reference project shall include the pipe dimensions, length of installation, size/type of flow control required to perform the Work, description of the actual work performed including installation method, owner's name, telephone number and contact person, date of installation. It is required that the Superintendent(s) named are the Superintendent(s) assigned to this project and on-site during construction. The Contractor is always required to have at least 1 qualified Superintendent on site during the construction activities. All referenced experience shall be for projects completed within the United States or Canada and shall have used the same installation method, CIPP liner and resin combination proposed for this project. References will be checked.
 Subcontractors superintendent may represent the Contractor provided the superintendent has a minimum of five (5) years of experience with the work that they perform, possesses



all required safety training certifications, and if applicable, and has a current FDOT temporary traffic control certification. 06-08-2020 Conformed

2. **Installation Crew:** At least 1 person other than the Superintendent from the CIPP installation crew shall have a minimum of 3-year of CIPP experience totaling at least 20,000 lineal feet of 8-inch or greater installed liner. The crewmember with listed qualifications must be on the project site during all installation activities.
3. **Boiler Technician:** Contractor shall provide the name and information for the boiler technician who will perform the actual Work. The boiler technician must have a minimum of 5 projects totaling at least 50,000 lineal feet of CIPP lining in which a similar position was held.
4. **Lateral Cutter Technician:** Contractor shall provide the name and information for the technician who will perform the actual Work. The lateral cutter technician must have worked on a minimum of 5 projects totaling at least 2,000 service laterals that have been opened in sewer mains that have included CIPP lining.
5. **Lead CCTV inspector** shall be NASSCO PACP certified to report liner defects.
6. The final decision to accept or reject the product, manufacturer, and/or installer lies solely with the County. The named Manufacturer, Field Superintendent, CIPP Lead Installer, Boiler Technician, and Lateral Cutter must be employed to perform the Work, unless changes are specifically authorized by the County.

C. These qualifications shall include detailed descriptions of the following:

1. To be acceptable, the contractor must have a minimum of 1,500 lateral liner installations in Florida.
2. To be acceptable, the contractor must have had a minimum of 3-years active experience in the commercial installation of the lateral lining.

D. Chemical Root Treatment.

1. Treatment shall be performed by a licensed Certified Pesticide Applicator with the State of Florida. 06-08-2020 Conformed.



E. Chemical Grout Applicator.

1. Chemical sealant shall have documented service of successful performance in similar usage with a minimum of 12000 joints/pipe defects and 1000 lateral joints grouted.

1.03 WARRANTY

- A. The materials used for the project shall be certified by the manufacturer for the specified purpose. The Contractor shall warrant the liner material and installation for a period of one (1) year from the date of final payment for the respective Work Order. During the Contractor warranty period, any defect which may materially affect the integrity, strength, function and/or operation of the pipe, shall be repaired at the Contractor's expense in accordance with procedures in these specifications and as recommended by the manufacturer.
- B. On any work completed by the Contractor that is defective and/or has been repaired, the Contractor shall warrant this work for an additional one (1) year.

1.04 NOTICES

- A. General

- A. All notices or other papers required to be delivered by the Contractor to the City shall be delivered to the City of St. Augustine, Public Works Department, 75 King Street, St. Augustine, FL 32084.

1.05 WORK TO BE DONE

- A. The Contractor shall furnish all labor, materials, equipment, tools, services, and incidentals to complete all work required by the contract specifications and included in the Work Order documents. Progress on the work shall be at a rate which will ensure completion of the Work by the end date defined in the respective Work Order.
- B. The Contractor shall perform the Work complete, in place, and ready for continuous service, and shall include repairs, renewals, testing, permits, clean up, replacements, and site restoration required as a result of damages caused during this construction.
- C. The Contractor shall comply with all City, County, State, Federal, and other codes, which are applicable to the proposed Work.
- D. All newly constructed Work shall be carefully protected from injury in any way. No premature loading or post work inspections shall not be allowed until the renewal is properly cured and can withstand internal and external loading. All portions damaged shall be reconstructed by the Contractor at his own expense.
- E. General Scope of Work: See Section 01010 "Summary of Work" and the Unit Price Schedule for work that will be included in an annual contract for cleaning and renewal of the City's sanitary sewers.

1.06 DRAWINGS AND PROJECT MANUAL

- A. The Work shall be performed in accordance with the Specifications prepared by the City. All work and materials shall conform to the specifications listed in Section 01010 and the City Public Works Standards and Specifications Design Manual and Details, latest edition or as indicated in the Work Order.
- B. The Contractor shall verify all field dimensions, quantities and details included in each Work Order or other data received from the City, and shall notify same, in writing, of all errors, omissions, conflicts and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction or improper operation resulting there from, nor from rectifying such conditions.
- C. All proposal requests are given with the best information available to the City. The scope of work included in Work Orders is what is anticipated but is subject to change based on field conditions.
- D. Intent:
 - 1. All Work called for in each Work Order applicable to this Contract, but not shown or referenced in the respective Work Order or contract shall be of like effect as if shown or mentioned in both. Work not specified either in the Work Order or in the Contract but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.
 - 2. Items of material, equipment, machinery, and the like may be specified in the Work Order and

not in the Contract Specifications. Such items shall be provided by the Contractor in accordance standards referenced in the Contract.

3. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any Work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

- E. The more detailed work requirement will take precedence of the Contract and Work Order documents.

1.07 PROTECTION AND RESTORATION

- A. The Contractor shall be responsible for the preservation of all public and private property and shall use every means of protection necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or the Contractor shall make good the damage in other manner acceptable to the City.

- B. Protection of Trees and Shrubs

1. Protect with boxes or other barricades.
2. Do not place excavated material to injure trees or shrubs.
3. Install pipelines in short tunnels between and under root systems.
4. Support trees to prevent root disturbance during nearby excavation.

- C. Tree and Limb Removal

1. Tree limbs, which interfere with equipment operation and are approved for pruning, shall be neatly trimmed and the tree cut coated with tree paint.
2. The City may order the Contractor, for the convenience of the City, to remove trees along the line or trench excavation. The Contractor shall obtain any permits required for removal of trees. Ordered tree removal shall be paid for under the appropriate Contract Items.

- D. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by the Contractor with new stock of similar size and age, at the proper season and at the sole expense of the Contractor.

- E. Lawn Areas: All lawn areas disturbed by construction shall be replaced with like kind to a condition similar or equal to that existing before construction. Where sod is to be removed, it shall be carefully removed, and the same re-sodded, or the area where sod has been removed shall be restored with new sod in the manner described in the applicable section.

- F. Where fencing, walls, shrubbery, grass strips or area must be removed or damaged incident to the construction operation, the Contractor shall, after completion of the work, replace or restore to the original condition.

- G. The cost of all labor, materials, equipment, and work for restoration shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefore, as part of the overhead cost of the Work, and no additional payment will be made, therefore.

H. Property Damage

1. The Contractor/Subcontractor shall immediately investigate all reports of sewage backing up, blow-back, into fixtures served by the sewer section that is being cleaned, televised or rehabilitated. 06-08-2020 Conformed
2. The Contractor/Subcontractor will be required to notify the City immediately if he causes any damage to private or public property caused by activities related to this contract. The Contractor shall make repairs and/or clean the property immediately in a timeframe that is acceptable to the Property Owner and the City. 06-08-2020
3. The Contractor shall notify and keep the City informed of any property damage claim that arise from blow-back or backup in properties served by the sewer collection system. 06-08-2020 Conformed

1.08 PUBLIC NUISANCE

- A. The Contractor shall not create a public nuisance including, but not limited to, encroachment on adjacent lands, flooding of adjacent lands, or excessive noise.
- B. Noise control shall be in accordance with the City of St. Augustine Code of Ordinances Chapter 11 article IV.
- C. No extra charge may be made for time lost due to work stoppage resulting from the creation of a public nuisance.

1.09 WORK HOURS

- A. Weekday work hours will be from 7 AM to 7 PM and 10 AM and 6 PM on weekends. Unless specifically authorized in writing from the City.

1.10 MAINTENANCE OF SERVICE

- A. The Contractor shall, prior to interrupting any utility service (water, sewer, etc.) for the purpose of performing work, contact the City and make arrangements for the interruption which will be satisfactory to the City.
- B. Utilities that are damaged during construction shall be repaired by the Contractor and service restored within 4-hours of the damage. The City retains the option of repairing any damage to storm or Sanitary utility pipes in order to expedite service to the customers. The Contractor will remain responsible for all costs associated with the repair.

1.11 TRANSFER OF SERVICE

- A. When the City has accepted the rehabilitation of a manhole and placed it into operation, the transfer of service is complete. The Contractor may begin the work of removing the existing or temporary facilities.

1.12 LABOR

- A. Supervision: The Contractor shall supervise and direct the Work efficiently and with his best

skills and attention. The Contractor shall have a competent, English speaking superintendent or representative, who shall be on the site of the Project at all working hours, and who shall have full authority by the Contractor to direct the performance of the Work and make arrangements for all necessary materials, equipment, and labor without delay.

B. MANUFACTURER

1. All transactions with the manufacturers or Subcontractors shall be through the Contractor, unless the Contractor and the City request that the manufacturer or Subcontractor communicate directly with the City. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. All workmanship and materials shall be of the highest quality. The equipment shall be the product of manufacturers who are experienced and skilled in the field with an established record of research and development. No equipment will be considered unless the manufacturer has designed and manufactured equipment of comparable type and size and have demonstrated enough experience in such design and manufacture.
3. No material shall be delivered to the Site without prior submittal approval from the City.
4. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Project shall be the new (most current production at time of bid) and unused standard products of recognized reputable manufacturers.
5. Manufactured and fabricated products:
 - a. Design, fabricate and assemble in accord with the best engineering and shop practices.
 - b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - c. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.
 - d. Products shall be suitable for service conditions as specified and as stated by manufacturer.
 - e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.
 - f. Do not use material or equipment for any purpose other than that for which it is designed or is specified.
 - g. All lining materials shall come from manufacturer's whose quality system is registered to ISO 9001. 06-08-2020 Conformed



1.13 MANUFACTURER'S SERVICE

- A. Where service by the manufacturer is specified to be furnished as part of the cost of the Sewer Rehabilitation products, the expense of the Work shall be at incorporated into the respective unit price. 06-08-2020 Conformed
- B. The services provided shall be by a qualified manufacturer's service representative to demonstrate the product to City personnel, check and verify the completed installation and approve the installed products. Such services cover the period of time and for the number of trips required to meet the technical specification requirements
- C. The services shall further demonstrate to the City complete satisfaction that the equipment will satisfactorily perform the functions for which it has been installed.



1.14 INSPECTION AND TESTING

A. General

1. All materials and equipment furnished by the Contractor shall be subject to the inspection, review and acceptance of the City and meet the requirements of the technical specifications, codes and standards. If in the testing of any material or equipment it is ascertained by the City that the material or equipment does not comply with the Contract, the Contractor shall be notified thereof, and the Contractor will be directed to refrain from delivering said material or products, or to remove it promptly from the Site or from the Work and not accepted by the City shall be replaced with acceptable material or products, without cost to the City.
2. The Contractor shall give notice in writing to the City sufficiently in advance of his intention to commence the preparation of materials or products for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the preparation or application of materials. Upon receipt of such notice, the City may arrange to have a representative present at such times during the preparation, application, or testing of the materials or products; or the City will notify the Contractor that the inspection will be waived.
3. When inspection is waived or when the City so requires, the Contractor shall furnish to the City authoritative evidence in the form of Certificates of Proper use, surface preparation and installation from the Manufacturer. This certificate will state that materials used in the Work have been manufactured, installed and tested in conformity with their instructions, applicable standards and in accordance with the Contract Specifications. These certificates shall be notarized and accompany results of physical tests and chemical analysis, where necessary, that have been made directly on the product or on similar products of the manufacturer.
4. The Contractor must comply with these provisions before acceptance of the applied material or products by the City. Such inspections or acceptance by the City shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Specifications.

B. Cost

1. Contractor shall employ and pay for the services of an independent testing laboratory to perform testing indicated in the Contract Specifications, or at the City's discretion to ensure conformity with the Contract Specifications.
2. The cost of field leakage and pressure tests and shop tests of materials and equipment specifically called for in the Contract Specifications shall be borne by the Contractor. Such costs shall be deemed to be included in the Contract unit price.
3. The Contractor shall notify the City a minimum of 48-hours in advance of scheduled field tests.
4. The Contractor shall pay for all work required to uncover, remove, replace, retest, etc., any work not tested due to the Contractor's failure to provide the 48-hours advance notice or due to failed tests.

C. Shop Testing

1. Each material or system for which pressure, duty, capacity, rating, performance, and function or special requirements are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Specifications. No such material or products shall be shipped to the worksite until the City notifies the Contractor, in writing, that the results of such tests are acceptable.
2. The manufacturing company shall provide five (2) copies of the manufacturer's actual shop test data and interpreted results signed by a responsible official of the manufacturing company and

notarized, showing conformity with the Contract Specifications as a prerequisite for the acceptance of any materials or products used in manhole rehabilitations. The cost of shop tests and of furnishing manufacturer's preliminary and shop test data shall be in the Contract unit price.

D. Field Testing:

1. The City may at any time during the progress of the Work, request additional testing beyond that which is specified in the Contract Specifications. This testing will be at the City's expense. Contractor shall:
 - a. Arrange and have requested testing performed.
 - b. Secure and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.
 - c. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the testing laboratory.

E. Demonstration Tests: Upon completion of the Work and prior to final payment, all products installed under this Contract shall be subjected to acceptance or demonstration tests as specified or required to provide compliance with the Contract Specifications. The Contractor shall furnish all labor, fuel, energy, water and all other equipment necessary for the demonstration tests at no additional cost to the City.

F. Final Inspection: Prior to preparation of the final payment application, a final inspection will be performed by the City to determine if the Work is properly and satisfactorily constructed in accordance with the requirements of the Contract Specifications.

G. Inspection by Other Agencies: The Florida Department of Transportation, the Florida Department of Environmental Protection, and other authorized governmental agencies shall have free access to the site for inspecting materials and work, and the Contractor shall afford them all necessary facilities and assistance for doing so. Any instructions to the Contractor resulting from these inspections shall be given through the City. These rights of inspections shall not be construed to create any contractual relationship between the Contractor and these agencies.

1.15 PROJECT SITE AND ACCESS

A. RIGHT-OF-WAY AND EASEMENTS

1. The use of public streets and alleys shall be such as to provide a minimum of inconvenience to the public and to other traffic. Any earth or other excavated material shall be removed by the Contractor and the streets cleaned to the satisfaction of the City.
2. The Contractor shall not enter or occupy private land outside of easements, except by written permission of the property owner.
3. At the time of the Pre-Construction meetings, the Contractor shall become fully acquainted with the status of all easements.

B. ACCESS

1. Neither the material removed, nor the materials or equipment used in the construction of the Work shall be so placed as to prevent free access to all fire hydrants, valves, pumping stations or private utility facilities.
2. Access to businesses located adjacent to the project site must always be maintained. Contractor may prearrange the closing of business access with the business Owner. Such prearranged access closing shall not exceed two (2) hours. Property shall be restored, and all construction

debris removed within 48-hours of acceptance of each manhole rehabilitation.

3. Contractor agrees that representatives of the City and any governmental agents will have access to the Work wherever it is in preparation or progress and that the Contractor shall provide facilities for such access and inspection.

C. Hurricane Preparedness

1. During such periods of time as are designated by the National Weather Service, as being a hurricane alert, watch or warning the Contractor shall perform all precautions as necessary to safeguard the work and property, including the removal of all small equipment and materials from the site, lashing all other equipment and materials to each other and to rigid construction and any other safety measures as indicated below.
2. Upon Notification of a Hurricane Alert by the City Manager, all Contractors performing work within right-of-way of a designated evacuation route shall immediately secure their work within the right-of-way so that the route will accommodate unrestricted traffic flow.
 - a. Contractors performing work at all other locations shall remove all unnecessary debris, materials and equipment from the job site.
2. Upon Notification of a Hurricane Warning Contractors shall prepare to execute their approved Plan of Action on their specific projects.
3. Upon Notification of a Hurricane Watch Contractors shall implement their approved Plan of Action to protect the project and public.
 - a. For work within public right-of-ways, the Contractor will be notified by the City to suspend his construction operations.

1.16 UTILITIES

A. UTILITY CONSTRUCTION

1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes and all other appurtenances and facilities pertaining thereto, whether owned or controlled by governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage or water. Other public or private property, which may be affected by the Work, shall be deemed included hereunder.
2. All open excavations associated with manhole rehabilitations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Bridges provided for access to private property during rehabilitations shall be removed when no longer required.
3. If any excavation becomes a hazard, or if it excessively restricts traffic at any point, the City may require special construction procedures. As a minimum, the Contractor shall conform to the following restoration procedures:
 - a. Interim Restoration: All excavations shall be backfilled and compacted as specified by the end of each working day or proper barricades shall be in place before the end of the work-day. For excavations within existing paved areas; lime rock base or soil cement base (match existing) shall be spread and compacted to provide a relatively smooth surface free of loose aggregate material. At the end of each workweek, the asphaltic surface course shall be completed and opened to traffic. Contractor shall coordinate his construction activity including density tests and inspections to allow enough time to achieve this requirement. All driveway cuts shall be backfilled, compacted, and lime rock base spread and compacted immediately after installation. Contractor shall coordinate with the individual property owners prior to removing the driveway section.

- b. All materials and products shall be neatly stored in a location, which will cause the least disturbance to the public. All debris shall be removed and properly disposed of by the end of each working day.
- c. Final Restoration Overlay: After completing all installations, testing, and acceptance of the rehabilitation work by the City, final restoration shall be performed. Any additional restoration required after testing shall be repaired in a timely manner at no additional cost to the City.
- d. Maintenance of all restored facilities shall be the Contractor's responsibility. This maintenance shall be performed on an on-going basis during construction. The Contractor's Progress Schedule shall reflect the above restoration requirements.
- e. Additional Restoration for Work in Business, Commercial or Historic Districts: The Contractor shall restore all private property, damaged by construction, to its original condition. Access to businesses located adjacent to the project site must always be maintained. Contractor may prearrange the closing of business accesses with the business owner. Such prearranged access closing shall not exceed two (2) hours. Property drainage and grading shall be restored within 24-hours of backfilling trench.

B. EXISTING UTILITIES

- 1. The locations of all existing underground piping, structures and other facilities are not provided in Work Orders. The Contractor will need to be requested "one call" for locates as needed for rehabilitation work. It is the Contractor's responsibility to verify all existing underground piping, structures and other facilities.
- 2. The Contractor shall, at all times, employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of existing utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, utility services; and shall cooperate fully with the owners thereof to that end.
- 3. When existing facilities are found to conflict with the Work, the City reserves the right to modify the scope of work in the respective Work Order to avoid interference with existing facilities and associated delays.
- 4. All utilities, which do not interfere with the work, shall be carefully protected against damage. Any existing utilities damaged in any way by the Contractor shall be restored or replaced by the Contractor at his expense as directed by the City. Any existing facilities, which require operation to facilitate repairs, shall be operated only by the owner of the respective utility.
- 5. It is the responsibility of the Contractor to ensure that all utility and/or poles, the stability of which may be endangered by the proximity to rehabilitation work, be temporarily stayed and/or shored in position while work proceeds in the vicinity of the pole and that the utility or other companies concerned be given reasonable advance notice of any such excavation.

C. NOTICES

- 1. All governmental utility departments and other owners of public utilities, which may be affected by the Work, will be informed in writing by the Contractor one (1) week after the execution of the Work Order covering the Work. Such notice will be sent out in general and directed to the attention of the governmental utility departments and other owners of public utilities for such installations and structures as may be affected by the Work.
 - a. Property owners shall be notified by the Contractor with door hangers at least 3 days prior to the shutdown of any main or lateral services adjacent to the respective property(s). The door hanger shall be approved by the City. The notice will include work will begin, expected date of completion, type of work, and contact person for any questions about the work or door hangers. When it is necessary to shut down a private sewer lateral while

work is in progress and before the laterals are reconnected, the owner shall be notified by the Contractor.

- b. A written record of these notifications shall be maintained by the Contractor and submitted to the City prior to service shut off.
2. The Contractor shall comply with Florida Statute 553.851 regarding protection of underground gas pipelines. Evidence of notification to the gas pipeline owner shall be furnished to the City within one (1) week after the execution of the Work Order.
3. It shall be the Contractor's responsibility to contact utility companies at least 72-hours in advance of any excavations required to perform manhole rehabilitations in any area so maintenance personnel can locate and protect facilities, if required by the utility company.
4. The Contractor shall give a minimum five (5) working day notice to utility personnel prior to interrupting a utility service (water, sewer, etc.).
5. Contractor shall notify the City a minimum of 4-work days prior to performing any inspection work.
6. Note that notification requirements associated with manhole rehabilitations are included in other Sections that are part of this contract.
7. Traffic changes.
 - a. The Contractor will notify individual owners, owner's agents, and tenants of buildings affected by construction, with copies to the City, 72-hours in advance of any construction activities.
 - b. The Contractor shall notify residents and pedestrians via message boards no later than 10 days prior to the closure of any road lane or pedestrian thoroughfare.
 - c. The Contractor shall notify Emergency Management Services agencies, St. Johns County EOC no less than 7 days prior to such closures or whenever roads are impassable.
 - d. Implement closing of vehicle or pedestrian thoroughfare in accordance with construction drawings and the approved Traffic Control Plan.
 - e. The Contractor will immediately notify the City of any vehicular or pedestrian safety or efficiency problems incurred as a result of the construction of the Project.

1.17 RELATED CONSTRUCTION REQUIREMENTS

A. PUBLIC INFORMATION OFFICER

1. The Contractor shall provide community interaction and coordination through Work Order Manager (WOM). The WOM will provide resolution to complaints and problems from community members affected by the construction for the entire project duration. The City maintains a 24-hour phone number for citizens to call in cases of emergency. The City will field these calls, provide answers to questions, research issues with the project team or appropriate agencies and follow up each complaint in a timely manner. The WOM will maintain a daily diary of call and/or interactions with the community, as well as a complaint log chronicling all issues and proposed resolutions.
2. The WOM shall attend the project progress meetings and provide the project team with a report of public issues since the last progress meeting. The WOM will also disseminate roadway closures, temporary and permanent restoration and other relevant construction information to the community, as well as, when appropriate, to the media, emergency services personnel and other interested agencies.
3. The designated WOM shall have previous experience in providing similar services.

B. TRAFFIC MAINTENANCE

1. Refer to Section 01570 – Maintenance of Traffic

C. BARRIER AND LIGHTS

1. The Contractor shall exercise extreme care in the conduct of the Work to protect health and safety of the workmen and the public. The Contractor shall provide all protective measures and devices necessary, in conformance with applicable local, state and federal regulations. Protective measures shall include but are not limited to barricades, warning lights/flashers and safety ropes.
2. All equipment and vehicles operating within 10-feet of the roadway shall have flashing strobe lights attached.

D. DUST AND EROSION CONTROL

1. The Contractor shall prevent dust nuisance from his operations or from traffic.
2. Contractor is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.
3. Refer to the City of St. Augustine Standards and Specifications Design Manual and Standards Storm Water Pollution Prevention Plan Sheet N-1 for erosion control requirements associated with manhole rehabilitation work.

E. LINES AND GRADES

1. Maintain existing lines and grades of the rehabilitated manholes. Where frames and covers are replaced refer to grade requirements in Section 02775, Wastewater Manhole Rehabilitation paragraph 3.19.

F. TEMPORARY CONSTRUCTION

1. Temporary fences: If, during the Work, it is necessary to remove or disturb any fencing, the Contractor shall at his own expense, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced.
2. Responsibility for Temporary Structures: In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation.

G. DAILY REPORTS

1. The Contractor shall submit to the City's Representative daily reports of construction activities excluding non-workdays. The reports shall be complete in detail and shall include the following information:
 - a. Days from Work Order commencement date.
 - b. Weather information
 - c. Work activities, including manpower, equipment and daily production quantities.
 - d. Major deliveries
 - e. Visitors to site
 - f. Test records
 - g. New problems, and
 - h. Other pertinent information
2. A similar report shall be submitted for/by each Subcontractor.
3. The report(s) shall be submitted to the City Representative within 2 days of the respective report date. Each report shall be signed by the Contractor's Superintendent or Project Manager.
4. If a report is incomplete, in error, or contains misinformation, a copy of the report shall be returned by the City Representative to the Contractor's Superintendent or Project Manager with corrections noted. When chronic errors or omissions occur, the Contractor shall correct the procedures by which the reports are produced.

H. CLEANING

1. During Construction

- a. During construction of the Work, the Contractor shall, at all times, keep the Site free from material, debris and rubbish as practicable and shall remove the same from any portion of the Site if, in the opinion of the City, such material, debris, or rubbish constitutes a nuisance or is objectionable.
- b. Provide on-site containers for the collection of waste materials, debris and rubbish and remove such from the Site periodically by disposal at a legal disposal area away from the Site.
- c. The Contractor shall remove from the site all surplus materials and temporary structures when no longer necessary to the Work at the direction of the County.

2. Final Cleaning

- a. At the conclusion of the Work, all equipment, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and the Contractor shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances. Employ skilled workmen for final cleaning. Thoroughly clean all installed equipment and materials to a bright, clean, polished and new appearing condition. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- b. The Work site surrounding the rehabilitated manhole shall be returned to the pre-construction condition documented by video and photographs. The condition is to be equal or better than what existed before the Work.
- c. Prior to final completion, or City beneficial occupancy, Contractor shall conduct an inspection of interior and exterior surfaces, and all work areas to verify that the entire Work is clean. The City will determine if the final cleaning is acceptable. or political subdivision having jurisdiction.

I. RESPONSIBILITY FOR OVERFLOWS AND SPILLS

1. It shall be the responsibility of the Contractor to schedule and perform his work to result in no overflows or spills of sewage from the system. If sewage flows are such that they interfere with the Contractor's ability to perform work, the Contractor shall be responsible for scheduling his work during low flow periods or provide bypass pumping. Bypass pumping shall be provided only with the specific written approval of the City.
2. In the event of overflows caused by the Contractor's work activities, the Contractor shall immediately take appropriate action to contain and stop the overflow, clean up the spillage, and disinfect the area affected by the spill. The Contractor shall also notify the City Utility Manager immediately upon becoming aware of the discharge. They will provide instructions on this notification during and after normal business hours, nights, weekends and holidays.
3. The Contractor will reimburse the City for all sampling, testing and analysis necessary to document that the contamination caused by overflows or spills associated with their work has been eliminated.
4. In the City's opinion, if the Contractor has not taken immediate actions necessary when a spill or overflow occurs the City will provide the labor, equipment, materials and related costs to

stop the overflow, clean up the spillage and disinfect the area. The Contractor will be responsible to reimburse the City for all documented costs incurred as a result of spills and overflows related to the Contractor's work.

5. Immediate actions are to be taken to stop the overflow and eliminate the potential public health hazard. Actions to address overflows is a condition precedent to all work.
6. All overflows, regardless of quantity will needed to be documented on a Sanitary Sewer Overflow (SSO) Report and submitted to the Florida Department of Environmental Protection Northeast District Office.
7. Contractor will indemnify and hold harmless the City for any fines or third-party claims for personal or property damage arising out of a spill or overflow that is fully or partially the responsibility of the Contractor. Should fines subsequently be imposed as a result of any overflow for which the Contractor is fully or partially responsible, the Contractor shall pay all such fines and all of the City's legal, engineering, and administrative costs in defending such fines and claims associated with the overflow or spill.

J. CHEMICAL ROOT TREATMENT OF SANITARY SEWER LINES

1. The Contractor shall provide Pollution Liability Insurance in addition to all other insurances required by the City.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - WORK COVERED BY CONTRACT DOCUMENTS

1.01 General

- A. This Contract is for the Cleaning and Renewal of Sanitary Sewer mains and laterals as described in the sections in the contract documents.
- B. The Work consists of cleaning and inspections, reports and repair recommendations for sewer mains, laterals, and connections/taps.
- C. Upon approval of repair recommendations, a request for proposal will be made for the agreed renewals procedures. Upon the City of acceptance of the main and lateral renewals a request for a proposal will be issued.
- D. Upon the City's approval of the renewal proposal a work order will be issued to renew designated main and lateral segments and/or sections.
- E. Contract Documents
 - 1. Section 01001 General Work Requirements
 - 2. Section 01010 Summary of Work
 - 3. Section 01101 Special Requirements (Gravity Inspections only)
 - 4. Section 01200 Project Meetings
 - 5. Section 01300 Submittals
 - 6. Section 01516 Collection System Bypass
 - 7. Section 01570 Maintenance of Traffic
 - 8. Section 02761 Cleaning Sanitary Sewer Systems
 - 9. Section 02762 Televising Sanitary Sewer Systems
 - 10. Section 02763 Televising Sanitary Sewer Laterals
 - 11. Section 02766 Sanitary Sewer Obstruction Removal
 - 12. Section 02771 Cured-In-Place Pipe for Sanitary Sewer Renewal
 - 13. Section 02772 Cured-In-Place Pipe for Lateral Renewal
 - 14. Section 02773 Service Lateral Cleanouts for Televising Access
 - 15. Section 02959 Sanitary Sewer Main and Lateral Connection Sealing by Chemical Grout
 - 16. City of St. Augustine (COSA) Standards and Specifications Design Manual and Details.
 - 17. Unit Price Schedule.
- F. Work that is covered with rehabilitations of the City sanitary sewers:
 - 1. All submittals in accordance with section 01300 and listed in the technical specifications.
 - 2. Attending and participating in work order pre-work and progress meetings in accordance with section 01200.
 - 3. Submitting and periodically updating work schedules.
 - 4. Audio- Visual documentation of sanitary sewer mains and lateral services both pre and post rehabilitation.
 - 5. Maintenance of Traffic in accordance with section 01570.
 - 6. Collection system bypassing in accordance with section 01516.
 - 7. Distribute notices, door hangers, to all residents and businesses in the location of work.
 - 8. Site security and safety.
 - 9. System type product application demonstrations for City personnel prior to application. These demonstrations will only apply to the first time the system or products use for renewal is proposed.

10. Interior surface preparation.
11. Point repairs with CIP sectional liners of sewer mains, laterals, service connections including end seals.
12. Point repairs with chemical grout of sewer mains, laterals, or at service to main fittings.
13. CIPP sewer main segments with or without pre-liners and end seals.
CIPP sewer laterals to the right-of-way line or point of service with end seals where they apply.
14. All restorations and cleanup.

3.01 SEQUENCE OF WORK

- A. The Contractor shall establish his work sequence based on the use of crews to facilitate completion of construction and testing within the specified Contract Time.
- B. The Contractor shall submit a schedule and work sequence to the Owner at least five (5) days prior to the Notice to Proceed. Work on all utility lines shall be accomplished so that all facilities will stay in operation.

PART 4 - PRODUCTS (NOT USED)

PART 5 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01101
SPECIAL REQUIREMENTS (GRAVITY INSPECTION ONLY)

PART 1 - GENERAL

1.01 REQUIREMENTS

- A. The Contractor shall meet these minimum qualifications for closed circuit televising (CCTV) inspections of gravity sewers. Attend coordination meeting, provide proper notifications, and maintain an accurate weekly schedule. Contractor shall abide by the causes for rejection of Work in this section and other provisions described in other sections.

1.02 PRE-WORK

- A. Site conditions to be documented through video or still photographs prior to inspections. This documentation needs to include the location, date, time of day that the conditions were documented.

1.03 SUBMITTALS

- A. The qualifications of the cleaning and CCTV Contractor shall be submitted and shall include detailed descriptions of the following:
1. Name, business address and telephone number of the CCTV Contractor
 2. Name(s) of all supervisory personnel to be directly involved with this Project
 3. NASSCO PACP certification of on-site operator performing inspections or subject to City approval, resume of proposed CCTV operator displaying similar inspection experience
 4. The Contractor shall sign and date the information provided and certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this Project. Substitutions of personnel and/or methods will not be allowed without written authorization of the City.
 5. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the City.
- B. The inspection Contractor must have an internal quality assurance/quality control program in place and all inspection data shall be subjected to the procedures prior to submittal to the City. The City will perform QA/QC audits on submitted data.
- a. QA/QC shall be performed by NASSCO PACP certified personnel.
- C. Refer to Technical Specifications Sections for submittals specific to each phase of the work.
- D. The CCTV Inspection Contractor shall submit a completed qualification form with the required information (see Table A - CCTV Inspection Contractor Qualification Form).

E. Previous Work Products:

1. The Contractor shall submit one (1) example of previous Pre and Post sewer renewal closed circuit televising (CCTV) inspections gravity sewers work for approval. The approved sample will establish the quality of deliverable to be expected on the project. The submitted example shall be the work of the field supervisor or foreman to be used on this Project.
2. The Contractor shall provide a minimum of 5 references for lining and grouting work performed. The references are to include the date when the work was performed, owner name, owner's representative name and phone number and type of work performed.

F. All submittals are due as scheduled Work will not proceed until all submittals are received and approved. The City reserves the right to adjust the due dates of the submittals based on Contractors performance. The Contractor shall label each submittal indicating what is represented, name of Contractor, and project number. All submittals identified as being in error shall be re-performed and corrected at the Contractor's expense. The City will have two workdays to review and status each submittal.

1. Qualifications of personnel.
 - a. State licensed
 - b. OSHA certified for confined space entry
 - c. FDOT MOT trained.
2. **Company safety and site-specific plan.**
3. Name of the project manager and site superintendent with resumes.
4. Documentation of NASSCO PACP certification for all CCTV operators, database and software.
5. Sample of pre-work notices to property owners.
6. FDOT MOT training certificates.
7. Sample of pre-work notices to property owners.

TABLE - A
CITY OF ST. AUGUSTINE PUBLIC WORKS DEPARTMENT
CCTV INSPECTION CONTRACTOR
QUALIFICATION FORM

<i>Company Reference Projects</i>		<i>Total Footage</i>	<i>Project Completed</i>	<i>Client Company</i>	<i>Contact Name</i>	<i>Contact (Phone Number and/or E-mail Address)</i>
<i>Listing of Company Management Personnel</i>	<i>PACP (Certification #)</i>	<i>MACP (Certification #)</i>	<i>Years of Experience in CCTV</i>	<i>Years of Experience as Supervisor</i>	<i>QA/QC Mgmt Supervisor (Y or N)</i>	<i>Position Title</i>
<i>Company Equipment Item</i>	<i>Manufacturer</i>	<i>Model No.</i>	<i>Description</i>			
Main Line CCTV Camera						
Lateral Camera (push type)						
Lateral Camera (launch type)						
Video Capture System						
PACP-Compliant Inspection Data Logging System						
Combination Jetter/Vacuum Truck						

(Rev.June/2018)

PART 2 - PRODUCTS (NOT USED)**PART 3 - EXECUTION****3.01 CONTRACT COORDINATION MEETING**

- A. Refer to Section 01200 for meeting requirements.

3.02 GENERAL PROGRESSION OF WORK

- A. Contractor shall submit an updated schedule of inspection and lining activities on a weekly basis if changes have been made to the original or updated project schedule.

- B. Contractor shall notify the City of work scheduled in accordance with Section 01001 General Work Requirements paragraph 1.16.C.
- C. All work shall be performed in an orderly, organized fashion, progressing through the project area(s) in a systematic manner. Contractor shall adhere to submitted and communicated schedules.

3.03 QUALITY ASSURANCE

- A. The Contractor shall have a QA/QC plan and procedures to ensure accurate data collection, documentation and submittal.
- B. The City has adopted the NASSCO PACP quality control procedures as the minimum standard to be applied to all submitted CCTV Inspection data. All submitted data shall be quality checked in accordance with these procedures.
- C. Cleaning operations shall be conducted by experienced personnel who have previously been engaged in cleaning operations of similar community systems is preferred. Cleaning experience in coastal community systems is preferred.
- D. The City will perform QA/QC checks on a minimum 5% of submitted inspection data.
- E. All submitted data will be subject to City QA/QC following the same procedures set forth herein following in paragraph 3.04 "CCTV Inspection QA/QC Procedures."

3.04 CCTV INSPECTION QA/QC PROCEDURES

- A. The Contractor shall determine the approximate number of inspections performed by each inspection field supervisor/foreman that submitted data on a weekly basis to determine the quality control sampling population. A review of a minimum of 5% of the total inspections is required.
- B. The Contractor shall number the inspection reports in the order they were inspected.
- C. The Contractor shall utilize a random number generator to determine the inspection report numbers for review.
- D. Each inspection report that corresponds to the random numbers will be marked for review, the inspection report printed, and the video copied to the QA/QC directory.
- E. Each selected inspection report will be reviewed in detail against the inspection digital video.

- F. Each field that is populated and those that should have been populated will be counted to produce a "number of fields checked" for the required header information and detailed inspection information. The fields with errors, or missing data, regardless of the error will be totaled to determine the "error count". The accuracy level will then be calculated as follows: $100 - ((\text{error count} / \text{number of fields checked}) * 100) = \text{accuracy percentage}$.
- G. The percentage accuracy shall be entered onto a graph so that the on-going accuracy of each supervisor (operator) can be seen.
- H. The accuracy of each field supervisor/foreman's data shall exceed 90%.
- I. The Contractor shall submit, along with the inspection deliverables, quality control forms that include a hard copy print out of the inspection reports checked with errors and omissions clearly marked.
- J. The Contractor shall enter the accuracy level calculations in each supervisor (operator) quality control log.

3.05 REJECTION OF WORK

- A. Failure of City QA/QC checks will result in a "quality deficiency" notification to request from the Contractor how the rejected Work shall be addressed.
- B. Failure to notify City prior to field work being performed in accordance with the City notification procedures may constitute rejection of Work that was performed without notification.
- C. Payment shall be withheld for inspection work not passing the City QA/QC check, until such time that the data is re-submitted and verified accurate.
- D. Subsequent failures of City QA/QC checks may result in the City requiring a change in field supervisor.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Contractor participation in pre-work conferences, and by exception progress, planning and demonstration meetings.
- B. Progress and planning meeting exceptions. Progress and planning meetings may be held on a by-weekly frequency for work orders extending 8 calendar weeks or more. Demonstration meetings will be held when new system type products are proposed for renewal work. System type products are those materials that has multiple components.

1.02 MEETINGS CALLED BY THE CITY

- A. The City will schedule and administer a pre-work conference, and by exception progress meetings and specific topic meetings throughout the progress of the Work. The City will:
 - 1. Prepare and distribute a notification of the meeting to required attendees.
 - 2. Establish, prepare and distribute an agenda with the notification.
 - 3. Make physical arrangements for the meetings.
 - 4. Preside at meetings.
 - 5. Prepare and distribute minutes of meetings including significant proceedings and decisions, within 15 working days after each meeting. Minutes will be forwarded to all participants and to parties affected by decisions made at the meeting.
- B. Representatives of the Contractor, Subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The pre-work meeting location will be held at the 4th floor of City Hall in the Public Works Conference Room and any progress or specialty meetings may be held at the City Field Operations Facilities. All contractor employees may obtain parking passes for the meeting at City Hall. The parking at the operations facilities is informal.

1.03 PRE-CONSTRUCTION CONFERENCE

- A. Attendance:
 - 1. City
 - 2. Contractor and superintendent
 - 3. Subcontractors as appropriate to the agenda
 - 4. Representatives of suppliers and manufacturers as appropriate to the agenda
 - 5. Other agency representatives (FDOT, SJC, etc.)
 - 6. Others as requested by the City or Contractor
- B. Prior to commencing field activities, the Contractor shall attend a Coordination Meeting with the City. Contractor shall be prepared to discuss the following agenda items:

1. Project contacts
2. City notification procedures
3. Public notification requirements
4. Inspection QA/QC
5. Deliverables
6. Schedule

1.04 PROGRESS MEETINGS

- A. See pre-work meeting paragraph 1.03. The Contractor's representative is to attend meetings and have the authority to act on behalf of the entity represented on field related matters. Contractor's representative is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics and provide specific information on the agenda.
- B. Revision to Minutes:
 1. A draft of the meeting notes will be distributed to the attendees. A time frame will be provided for any suggested changes. Meeting notes will be issued at the end of this time period or when all changes or content is finalized.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01300**SUBMITTALS****PART 1 - GENERAL**

- A. Work completed without approved Shop Drawings and/or samples shall be considered installed at the Contractor's risk.

1.01 SHOP DRAWINGS AND DATA

- A. Contractor's drawings, certifications, samples, proposed equipment, plans, data sheets and forms shall be clearly marked with specification title and numbers to identify pertinent materials. Delete information which is not applicable to the Work by striking or cross-hatching.
- B. If Shop Drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in the letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, the Contractor shall not be relieved of the responsibility for executing the Work in accordance with the Contract, even though such Drawings have been reviewed.
- C. All submittals are to be in conformance with applicable standards or codes.
- D. Submittals may be provided electronically via portable hard drives, ftp web sites or similar.

1.02 REVIEW OF SHOP DRAWINGS AND SAMPLES

- A. The City /Professional's review of submittals and samples as submitted by the Contractor will be to determine if the items(s) generally conform(s) to the information in the Contract Documents.
- B. The review of submittals will be general, and shall not be construed:
 - 1. As permitting any departure from the Contract Documents
 - 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials
 - 3. As approving departures from details furnished by the City/Professional, except as otherwise provided herein
- C. If the drawings or schedules as submitted describe variations and show a departure from the Contract Documents which the City/Professional finds to be in the interest of the City and to be so minor as not to involve a change in Contract Price or Contract Time, the City/Professional may return the reviewed drawings without noting an exception.
- D. "Approved as Noted": Contractor shall incorporate City/Professional's comments into the submittal before release to manufacturer. The Contractor shall send a letter to the City/Professional acknowledging the comments and their incorporation into the Shop Drawing.
- E. "Amend and Resubmit": Contractor shall resubmit the Shop Drawing to the City. The resubmittal shall incorporate the City's comments highlighted on the Shop Drawing.

- F. "Rejected": Contractor shall correct, revise and resubmit Shop Drawing for review by City.
- G. "Record Copy" will be accepted for record purposes only.
- H. Resubmittals will be handled in the same manner as first submittals. For resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by City on previous submissions. The Contractor shall make any corrections required by the City.
- I. When the Shop Drawings have been completed to the satisfaction of the City/Professional, the Contractor shall carry out the Construction in accordance therewith and shall make no further changes therein except upon written instructions from the City.

1.03 **PRODUCT DATA**

- A. Submit not less than 1 electronic or 2 -copies, unless approved by the City. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturers' standard data to provide information unique to the Work.

1.04 **SAMPLES**

- A. Submit the number of samples specified in the respective Specification section, but no less than two (2). After review one (1) will be retained by the City. Reviewed samples that may be used in the Work are indicated in the Specification Section.
- B. Samples shall be of sufficient size to clearly illustrate:
 - 1. Each sample shall have a label indicating:
 - a. Name of Project
 - b. Name of Contractor and Subcontractor
 - c. Material or equipment represented
 - d. Place of origin
 - e. Location in Project
 - f. Specification title and number
 - g. Submittal number

1.05 **DRAWINGS, PRODUCT DATA AND CERTIFICATES**

- A. Each letter of transmittal shall identify every item transmitted by title, drawing number, revision number and date.
- B. The following is applicable to submitted videos, plans, drawings, and certificates:
 - 1. Each submittal shall identify applicable Standards.
- C. When resubmission is required, the City will return only one (1) marked up copies. A third submission from the same manufacturer will not be accepted.

1.06 SUBSTITUTIONS

- A. The substitution requirements of this Section are in addition to the requirements of the General Conditions.
- B. When a product is specified or called for, it is intended and shall be understood that the proposal tendered by the Bidder includes those products in his Bid. Substitutions will only be considered in cases where original materials are unavailable or in an instance where substitute can be proven superior in its planned application
- C. The intent of these specifications is to provide the City with a quality facility without discouraging competitive bidding. For products specified only by reference standards, performance and descriptive methods, without naming manufacturer's products, the Contractor may provide the products of any manufacturer complying with the Contract Documents, subject to the review of product data by the City as specified herein.
- D. The City's approval is required for substitutions.
- E. The Contract is based on the materials, equipment and methods described in the Contract Documents.
- F. Do not substitute materials, equipment or methods unless such substitution has been specifically approved for this Work by the City in writing. The Contractor must provide a submittal per this Section specifically requesting approval of the substitution. Failure to specifically identify the requested substitution may invalidate approval of a submittal.

1.07 AVAILABILITY OF SPECIFIED ITEMS

- A. Verify prior to bidding that all specified items will be available in time for installation during Construction for orderly and timely progress of the Work.
- B. If specified items will not be available, notify the City prior to receipt of proposals.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SUBMITTAL PROCEDURES

- A. On resubmittals, direct specific attention in writing or on the revised Drawings or sample to revisions other than the corrections required by City on previous submissions.
- B. All drawings, schematics, manufacturer's product data, certifications and other drawing submittals required for a system specification shall be submitted at one time as a package to facilitate interface checking.

- C. All Shop Drawings shall be accompanied with a transmittal letter providing the following information:
1. Project Title and Contract Number
 2. Date
 3. Contractor's name and address
 4. The number of each Shop Drawing, project data, and sample required
 5. Notification of Deviations from Contract Documents
 6. Submittal Log Number conforming to specification section numbers
 - a. Submit each specification section separately.
 - b. Identify each Shop Drawing item required under respective specification section.
 - c. Identify resubmittal using specification section followed by A (first resubmittal), B (second resubmittal) ...etc.

3.02 CITY'S REVIEW

- A. Corrections or comments made on Submittals during review do not relieve the Contractor from compliance with the requirements of the Specifications and standards. This check is only for review of general conformance. Any substitutions or changes shall be properly noted.
- B. Review Time:
1. On a normal basis, each submittal will be returned to the Contractor within 2 working days of the date it is received. CCTV videos will be an exception.
 2. If, for any reason, the above schedule cannot be met, the Contractor will be so informed within a reasonable period.

END OF SECTION

SECTION 01516

COLLECTION SYSTEM BYPASS

PART 1 - GENERAL



1.01 SCOPE OF WORK

A. SEWER BYPASSING AND DEWATERING

1. Contractor shall provide all isolation and bypass operations: The Contractor's objective of flow bypass and/or diversion pumping is to maintain an efficient and uninterrupted level of service to wastewater collection system users while maintenance or construction operations (including rehabilitation, repair or replacement) are being performed on the segment(s) being bypassed and/or from which flow is being diverted by:
 - a. Ensuring that bypass and diversion pumps are adequately fueled, lubricated and maintained.
 - b. Ensuring backup spare parts are expeditiously applied to the flow bypass and/or diversion pumping system in the event of component breakdown.
 - c. Ensure an emergency backup plan is smoothly implemented in the event of system failure.
 - d. Preventing backup, spillage, flooding or overflow onto streets, yards and unpaved areas or into building, adjacent ditches, storm water mains and waterways while flow bypass or diversion pumping takes place.
 - e. Ensuring that installation, startup and subsequent disassembly of the flow bypass and diversion pumping system is smoothly transitioned.
2. Flow bypass and diversion pumping shall be done in such a manner so as not to damage private or public property or create a nuisance or public menace. The pumped sewage shall be in an enclosed hose or pipe that is adequately protected from traffic and shall be redirected into the wastewater collection system. After the work is completed, flow shall be returned to the sewer and all temporary equipment removed. The pumped storm water shall be in an enclosed hose or pipe that is adequately protected from traffic and shall be redirected into the storm water system. After the work is completed, flow shall be returned to the storm water mains and all temporary equipment removed.
3. When pumps are operating, an experienced bypass/diversion pump maintenance operator/mechanic and/or deputy shall continuously be on site to monitor the operation of the entire bypass/diversion system. The operator/mechanic shall comprehensively, methodically and continuously:
 - a. Adjust pump speed as appropriate so as not to adversely impact upstream or downstream flow condition levels.
 - b. Check that the effectiveness and security of bulkheads, dams, diaphragms, plugs, valves, weirs and all other flow control devices are working effectively and according to plan.

- c. Check the integrity of hoses and couplings along the entire bypass/diversion system.
 - d. Monitor lubrication levels and top off as necessary.
 - e. Facilitate minor repairs as required.
 - f. Report to City on problems arising.
4. The Contractor shall be solely responsible for planning and executing sewer flow control, bypass and diversion pumping operations. The Contractor shall be entirely liable for damages to private or public property that may result from his/her operations and for all cleanup, disinfection, damages, and resultant fines in the event of spillage, flooding or overflow.
 5. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.
 6. Once by-pass pumping is underway at any given site, work shall be completed as efficiently as possible without interruption.
 7. The level of noise emitted from pumps must be within regulations/ordinance parameters.
 8. On all sewer mains which have sags or dips, to an extent that the television camera lens becomes submerged during the television inspection, the Contractor shall use a high pressure cleaner to draw the water out of the pipe, or other means, to allow inspection of the pipe and identification of pipe defects, cracks, holes and location of service connections.

1.02 SUBMITTALS

- A. Prior to implementation of any bypass, the Contractor will submit and receive City acceptance of a bypass plan. The Contractor will submit to the City a comprehensive written plan for approval and acceptance that describes the intended bypass for the maintenance of flows during construction. The Contractor will also provide a sketch showing the location of bypass pumping equipment for each pump station or line segment(s) around which flows are being bypassed. The plan will include proposed tanker(s), pump(s), bypass piping, backup plan and equipment, work schedule, monitoring log for bypass pumping, monitoring plan of the bypass pumping operation, and maintenance of traffic plan.
- B. Provide prior notice to City for start-up and shutdown of bypass operations. Notice may be given by phone conversation  or text message to designated City representative. 06-08-2020 Conformed
- C. Spill response plan. 06-08-2020 Conformed 

PART 2 - PRODUCTS

2.01 GENERAL


- A. The Contractor will provide and maintain adequate equipment, piping, tankers, and other necessary appurtenances in order to maintain continuous and reliable wastewater service in all wastewater lines as required for construction. The Contractor will have tankers, backup pump(s), piping, and

appurtenances ready to deploy immediately.

- B. All piping will be designed to withstand at least twice the maximum system pressure or a minimum of 50-psi, whichever is greater.
- C. When bypassing a pump station, one (1) back-up pump equal to the primary unit will be provided by the Contractor. Bypass pumps shall have a maximum rating of 55 decibels for sound attenuation.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall have all materials, equipment and labor necessary to complete the repair, replacement, or rehabilitation on the job site prior to isolating the gravity main segment, manhole, or pump station. The Contractor will demonstrate that the temporary bypass pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24-hours prior to beginning the Work.
- B. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.
- C. Perform pre-test of bypass prior to beginning construction. Notify the City representative of when this testing is scheduled. 06-08-2020 Conformed 

3.02 TRAFFIC CONSIDERATIONS

- A. The Contractor shall locate bypass pumping suction and discharge lines to not cause undue interference with the use of streets, private driveways, and alleys, to include the possible temporary trenching of piping at critical intersections. Additional traffic maintenance requirements are found in Section 01570 "Maintenance of Traffic".

3.03 BYPASS OPERATION

- A. The Contractor shall submit a bypass plan to the City and the bypass plan must be approved before the bypass is operational to perform the Work. Contractor shall maintain the wastewater system flow and no surcharging will be allowed to occur out of the system.
- B. Where Work requires the main or pump station to be taken out service after normal working hours and bypass pumping is being used; the Contractor shall be responsible for monitoring the bypass operation 24-hours per day, 7-days per week. Any electronic monitoring in lieu of on-site monitoring must be detailed in the comprehensive written bypass plan.
- C. The Contractor shall ensure that no damage will be caused to private property as a result of bypass pumping operations. The Contractor will complete the Work as quickly as possible and pass all tests and inspections before discontinuing bypassing operations and returning flow to the wastewater manhole, main, or pump station.
- D. During bypassing, no wastewater will be leaked, dumped, or spilled in or onto, any area outside of the existing wastewater system.

- E. The Contractor shall immediately notify the City should a sanitary sewer overflow (SSO) occur. The Contractor shall take the necessary action to wash down, clean up and disinfect the spillage area to the satisfaction of the City or other governmental agency.
- F. The Contractor shall cease bypass operations and return flows to the new and/or existing sewer when directed by the City. When bypass operations are complete, all bypass piping shall be drained into the wastewater system prior to disassembly.

3.04 **CONTRACTOR LIABILITY**

- A. The Contractor shall be responsible for all required pumping, equipment, piping, and appurtenances to accomplish the bypass and for any and all damage that results directly or indirectly from the bypass pumping equipment, piping and/or appurtenances. The Contractor shall also be liable for all City personnel labor and equipment costs, penalties and fines resulting from sanitary sewer overflows. It is the intent of these specifications to require the Contractor to establish adequate bypass pumping as required regardless of the flow condition.

END OF SECTION

SECTION 01570

MAINTENANCE OF TRAFFIC

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section includes identifying safety hazards and then furnishing all necessary labor, materials, tools, and equipment including, but not limited to, signs, barricades, traffic drums, cones, flashers, construction fencing, flag persons, variable message boards, uniformed police officers, warning devices, temporary pavement markings, temporary sidewalk, delineators, etc., to maintain vehicular and pedestrian traffic through and adjacent to the project area. These measures and actions shall be taken to safely maintain the accessibility of public and construction traffic by preventing potential construction hazards. All materials, work and incidental costs related to Maintenance of Traffic will be paid for at the contract lump sum price.

1.02 REQUIREMENTS

- A. The Traffic Control Plan shall conform to the following standards:
1. Standard Specifications for Road and Bridge Construction, latest edition including all subsequent supplements issued by the Florida Department of Transportation, (FDOT).
 2. Manual on Uniform Traffic Control Devices for Streets and Highways by U.S. Department of Transportation, Federal Highway Administration.
 3. All references to the respective agencies in the above referenced standards shall be construed to also include the municipality as applicable for this Work.
- B. Sequence the Work in a manner that will minimize disruption of vehicular and pedestrian access through and around the construction area.
- C. Traffic planning and control for the maintenance and protection of pedestrian and vehicular traffic affected by the Contractor's Work includes, but is not limited to:
1. Construction and maintenance of any necessary detour equipment and facilities.
 2. Providing necessary facilities for access to residences and businesses.
 3. Furnishing, installing, and maintenance of traffic control and safety devices (e.g. signage, barricades, barriers, message boards, etc.), and flag persons as appropriate during Construction.
 4. Control of water runoff, dust and any other special requirements for safe and expeditious movement of traffic.
- D. Planning, maintenance and control of traffic shall be provided at the Contractor's expense. The Contractor will bear all expense of maintaining the vehicle and pedestrian traffic throughout the work area.
- E. The Contractor will ensure all personnel involved in traffic control are and capable of communicating with the public. The Contractor may be required to hire off-duty uniformed police officers, in addition to flag persons, to direct and maintain traffic. Locations and conditions requiring such uniformed police officers shall be as directed by the City. The Contractor shall be required to utilize uniformed police officers for work within FDOT maintained ROW, road closures affecting

school traffic and during all night work involving a road closure or crossing on nonresidential roads.

- F. The Contractor will remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.
- G. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

1.03 SUBMITTALS

- A. Submit at Contractor's own expense a Traffic Control Plan for approval by the controlling roadway agency (FDOT, St. John's County Public Works or other local government) having jurisdiction over the road for approval.
 - 1. The Traffic Control Plan will detail procedures and protective measures proposed by the Contractor to provide for protection and control of traffic affected by the Work consistent with the following applicable standards:
 - a. Standard Specifications for Road and Bridge Construction, latest edition including all subsequent supplements issued by the Florida Department of Transportation, (FDOT Spec.).
 - b. Manual of Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations, FDOT.
 - c. Right-of-Way Utilization Regulations, St. John's County, Florida, latest edition.
- B. All references to the respective agencies in the above referenced standards shall be construed to also include the municipality as applicable for this Work.
- C. The Traffic Control Plan will be signed and sealed by a Professional Engineer registered in the state of Florida and shall include proposed locations and time durations of the following, as applicable:
 - 1. Pedestrian and public vehicular traffic routing.
 - 2. Lane and sidewalk closures, other traffic blockage and lane restrictions and reductions anticipated to be caused by construction operations. Show and describe the proposed location, dates, hours and duration of closure, vehicular and pedestrian traffic routing and management, traffic control devices for implementing pedestrian and vehicular movement around the closures, and details of barricades.
 - 3. Location, type and method of shoring to provide lateral support to the side of an excavation or embankment parallel to an open travel-way.
 - 4. Allowable on-street parking within the immediate vicinity of worksite.
 - 5. Access to buildings immediately adjacent to worksite.
 - 6. Driveways blocked by construction operations.
 - 7. Temporary traffic control devices, temporary pavement striping and marking of streets and sidewalks affected by construction
 - 8. Temporary commercial and industrial loading and unloading zones.
 - 9. Construction vehicle reroutes, travel times, staging locations, and number and size of vehicles involved.
- D. Obtain and submit prior to erection, or otherwise impacting traffic, all required permits from all authorities having jurisdiction, excluding City of St. Augustine Public Works, if applicable.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. The Contractor shall furnish, erect, and maintain all necessary traffic control devices, including flag person, in accordance with the Manual of Uniform Traffic Control Devices for Streets and Highways published by the U.S. Department of Transportation, Federal Highway Administration.

1. FLAG PERSONS

- a. All flag persons used on this Project will adhere to the following requirements:
- b. Any person acting as a flag person on this Project will have attended a training session taught by a Contractor's qualified trainer before the start date of this Contract.
- c. The Contractor's qualified trainer will have completed a "Flag person Train the Trainer Session" in the 5-years previous or before the start date of this Contract and will be on file as a qualified flag person trainer.
- d. The flag person trainer's name and Qualification Number will be furnished by the Contractor at the Pre-Construction meeting. The Contractor will provide all flag persons with the Flag Person Handbook and will observe the rules and regulations contained therein. This handbook will be in the possession of all flag person while flagging on the Project.
- e. Flag persons will not be assigned other duties while working as authorized flag persons.
- f. Any person replacing flag person for break shall have the same training.

PART 3 - EXECUTION

3.01 NOTIFICATIONS

- A. Refer to Section 01001, General Work Requirements paragraph 1.16 for notification requirements.

3.02 GENERAL TRAFFIC CONTROL

- A. The Contractor will sequence and plan construction operations and will generally conduct Work in such a manner as not to unduly or unnecessarily restrict or impede normal traffic.
- B. Unless otherwise provided, all roads within the limits of the Work will be kept open to all traffic by the Contractor. The Contractor will keep the portion of the project being used by public traffic, whether it is through or local traffic, in such condition that traffic will be adequately accommodated.
- C. The Contractor will be responsible for installation and maintenance of all traffic control devices and requirements for the duration of the construction period. Necessary precautions for traffic control will include, but not be limited to, warning signs, signals, lighting devices, markings, barricades, canalizations, and hand signaling devices.
- D. The Contractor will provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages and farms.
- E. The Contractor will always provide emergency access to all residences and businesses. Residential and business access will always be restored and maintained outside of the Contractor's normal

working hours.

- F. Traffic is to be maintained on one section of existing pavement, proposed pavement, or a combination thereof. Alternating one-way traffic may be utilized and limited to a maximum length of 500-feet during construction hours. Lane width for alternating one-way traffic will be kept to a minimum width of 10-feet, or as directed by the City.
- G. Travel lanes and pedestrian access will be kept reasonably smooth, dry, and in a suitable condition at all times.
- H. The Contractor will make provisions at all "open cut" street crossings to allow for free passage of vehicles and pedestrians, either by bridging or other temporary crossing structures. Such structures will be of adequate strength and proper construction and will be maintained by the Contractor in such a manner as not to constitute an undue traffic hazard.
- I. The Contractor will keep all signs in proper position, clean, and legible at all times. Care will be taken so that weeds, shrubbery, construction materials, equipment, and soil are not allowed to obscure any sign, light, or barricade. Signs that do not apply to construction conditions should be removed or adjusted so that the legend is not visible to approaching traffic.
- J. The City may determine the need for, and extent of, additional striping removal and restriping.
- K. Excavated material, spoil banks, construction materials, equipment and supplies will not be located in such a manner as to obstruct traffic, as practicable. The Contractor will immediately remove from the site all demolition material, exercising such precaution as may be directed by the City. All material excavated shall be disposed of to minimize traffic and pedestrian inconvenience and to prevent damage to adjacent property.
- L. During any suspension, the Contractor will make passable and open to traffic such portions of the Project and/or temporally roadways as directed by the City for accommodation of traffic during the anticipated period of suspension. Passable conditions will be maintained until issuance of an order for the resumption of construction operations. When Work is resumed, the Contractor will replace or renew any Work or materials lost or damaged because of such temporary use in every respect as though its prosecution had been continuous and without interferences.

END OF SECTION

SECTION 02761

CLEANING SANITARY SEWER SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Work covered in this section consists of cleaning sewer and sanitary lateral lines prior to the internal television inspection(s) for new or existing Storm and wastewater systems.
- B. Sanitary Gravity Main and Service Lateral Cleaning: The intent of gravity main cleaning is to remove debris that may be causing a reduction in flow capacity, potential sewer backups, or that limits the ability to evaluate the structural condition of the pipe segment. On all sewers, the Contractor shall perform sewer-cleaning work to an acceptable level as necessary to perform a thorough television inspection of the sewer. An acceptable level is defined as the removal of all debris throughout the pipe segment cleaned. If the pipe condition is such that cleaning may cause a potential collapse, then the pipe shall be televised without attempting to clean it pending approval by the City.
- C. Water for Cleaning: The City shall provide access to water via fire hydrants for cleaning and other work items requiring water. The Contractor will be responsible for obtaining a transient water meter and paying for water used during course of cleaning. Additional compensation will be scheduled for extending water for cleaning greater than 500 feet from the main section to be cleaned.
- D. Recovering of Equipment: The Contractor will be responsible for recovering any equipment that becomes lodged or lost in the pipeline. The Contractor will be responsible for all costs associated with required evacuation, restoration of roads and easements, and repairs to pipes and manholes as needed to restore the pipeline and appurtenances back to their original conditions.
- E. Maintenance of Traffic (MOT)
Refer to General Requirements Section 01570, Maintenance of Traffic requirements.
- F. Existing Utilities: The Contractor must take the necessary precautions for the protection of any utility encountered on the project or the restoration of any utility damaged during the work.
 - 1. If an excavation is required, the Contractor shall notify, at least 48 hours before breaking ground, all public or private service corporations having wire, poles, pipes, conduit, manholes, or other structures that may be affected by this operation, including all structures which are affected and not shown on these plans. Owners of underground utilities, which are members of the state's one call service, can be notified by calling. Non-member underground utility Owners must be called directly.
 - 2. All maintenance, repair, and replacement of existing utilities shall be in accordance with the rules and regulations of the various utility companies having jurisdiction.
 - 3. All existing storm sewers, driveway drains, surface drainpipes and other property, removed or damaged during work to clean and inspect the sewers shall be repaired and reconnected by the Contractor as directed by the City at no additional cost to the City.

G. Request for Supplementary Information

1. It shall be the responsibility of the Contractor to make timely requests of the City for supplemental information, which should be furnished by the City under the terms of this contract, and as required in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved to avoid delay.
2. B. Each request shall be in writing and list the various items and the latest day by which each will be required by the Contractor. The first list shall be submitted within two (2) weeks after contract award and shall be as complete as possible at that time. The Contractor shall, if required, furnish promptly any assistance and information the City may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for all delays arising from failure to comply with this section.

H. Use of Premises

1. The Contractor shall not trespass upon or in any way disturb private property without first obtaining written permission from the property Owner and/or Owner or Prime Contractor as appropriate to do so. A copy of such written permission shall be furnished to the City prior to accessing the site.
2. It shall be the Contractor's responsibility to work equipment around poles, trees, or other obstructions and to do so at his own expense.
3. If the Contractor finds it necessary to obtain additional working area, it shall be the Contractor's responsibility for its acquisition.
4. The Contractor shall, at no additional expense, restore such property to the original condition in the sole and unfettered opinion of the property Owner. The Contractor must take photographs and/or videos of existing properties prior to disturbance of each property and make a copy available to the City.
5. All items within the street right-of-way or sewer easement shall be removed, or removed and replaced, or restored as directed by the City.
6. The Contractor shall ensure all employees have a badge or visible identification during any time that they on the project site or within private property. This identification must be worn so that it is readily recognized and readable to the public.

I. Protection of Trees

1. The Contractor shall avoid any unnecessary damage to trees. Branches which overhang the project limits, and which interfere with the operation of equipment shall be tied back to avoid damage, if possible. Where injury to branches is unavoidable, the branches shall be sawed off neatly at the trunk or main branch, and the cut area shall be protected with approved pruning spray immediately. The Contractor at no additional expense shall remove any trees damaged beyond saving and make restitution to the Owner (public or private).

J. Fencing

1. Any fences, including hedge and shrubs, that need to be removed to facilitate the work shall be replaced, in kind or with repairs satisfactory to the Owner, at the Contractor's expense. Replacement of fences, hedges, and shrubs shall be considered incidental to the contract and not measured for payment.

K. Restoration

1. All roadway berms and drainage ditches disturbed by the work shall be restored, reshaped, and graded to drain.
2. Pavement restoration, if necessary, shall conform to the City, County, or State standards and

- specifications depending upon who has jurisdiction for the street. Trench backfill and compaction shall be in conformance with the local street restoration jurisdiction.
3. The remediation of sunken trenches caused by activities conducted in this contract shall be the Contractor's responsibility. Sunken areas shall be backfilled and compacted to meet adjoining grades; the surface shall be re-seeded or resurfaced with asphalt or concrete matching the existing surfacing.
 4. The Contractor shall restore unpaved areas by seeding and mulching. No direct payment will be made for seeding and mulching.
 5. Driveways shall be restored in accordance with Owner's regulations, or the Owner's Specifications depending upon who has jurisdiction for the driveway.
 6. All disturbed areas shall be restored as nearly as possible to their original condition.
 7. All restoration shall be completed in strict accordance with the appropriate items of the standards, specifications or matching the pre-work conditions as directed by the Owner.
 8. The cost of all restoration of streets, drives, walks; sod, etc. shall be incidental to the contract and not measured for payment.
 9. Restoration shall be kept current with the project work. Failure to keep restoration of these items completed reasonably close shall result in a stop work notice and delay of payment until such restoration is completed to the satisfaction of the Owner.

L. Cleanup

1. The Contractor shall keep the work area in an uncluttered condition by the frequent removal of debris. The Contractor shall remove all debris and unused material and leave the area in a condition similar to the condition of the area before any work was performed.

M. Property Damage

1. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

N. Access to Municipal Water Supplies

1. The City will make available a construction hydrant meter for cleaning water supply.

O. Reference Technical Specification 02766, Sanitary Sewer Obstruction Removal for requirements related to protruding taps and other obstructions and for further requirements regarding root removal.

P. Responsibility for Overflows and Sills

1. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

Q. Installer Experience and Qualifications

1. Refer to Section 01001 General Work Requirements paragraph 1.02.B for minimum lining work experience. 06-08-2020 Conformed



1.02 CLEANING EQUIPMENT

A. Hydraulically Propelled Equipment:

1. The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against

flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery for grease removal. Special precautions to prevent flooding of the sewers and public or private property shall always be taken. Storm/Sewer cleaning balls or other such equipment which cannot be collapsed instantly to provide an immediate unobstructed flow-way during emergency conditions will not be considered as acceptable cleaning equipment. The movable dam shall be of equal diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure total removal of the grease of obstruction.

B. High-Velocity Jet (Hydro-Cleaning) Equipment:

1. All high velocity hydraulic sewer cleaning equipment shall be truck mounted. The equipment shall have a minimum of 500 feet of $\frac{3}{4}$ inch I.D. high pressure hose with a selection of two or more high velocity nozzles. The nozzles shall have a capacity of 30 GPM at a minimum working pressure of 1000 psi. The nozzles shall be capable of producing a scouring action of 15 to 45 degree in the direction of cleaning and perpendicular to the sewer axis in all size lines designated to be cleaned. Equipment shall also include a high velocity gun for washing and scouring manhole walls and floor. The gun capacity shall equal 3.5 to 27 GPM at between 200 and 800 psi. The gun shall be capable of producing flows from a fine spray to a long-distance solid stream. The equipment shall carry its own 1200-gallon (minimum) water tank capable of holding corrosive or caustic cleaning, sanitizing or degreasing chemicals if required by the City, auxiliary engines and pumps, and hydraulically driving hose reel. All controls shall be located so that the equipment can be operated underground.

C. Mechanically Powered Equipment:

1. Bucket machines shall be in pairs with each machine powered by a minimum of a 16-horsepower engine to ensure sufficient pulling power. Machines shall have an overload device. Machines with direct drive that could cause damage to the pipe will not be used. The belt clutch gear reduction shall be a combination of approximately 83 to 1 reduction in low speed and 55 to 1 in high speed. The power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750-feet of rod. The rod shall be specially heat-treated steel, designed for the purpose intended. The machine shall have a positive rod drive and produce a 2,000-pound rod pull. To ensure safe operation, the machine shall be fully enclosed body and an automatic safety throw-out clutch or relief valve. The final pass shall be with a brush large enough to assure that the line has been cleaned sufficiently. This brush shall be mechanically driven, with the power mechanism properly sized. All electrical drops required by the Contractor shall be arranged by the Contractor.

D. Vacuum machines:

1. May be used for removal of materials from manholes when other cleaning equipment is used to dislodge and transport material to the access point.

E. Combination Cleaner:

1. For cleaning small and large diameter sewer, the Contractor may use a combination hydraulic high-volume water and solids separation system. Water volume of up to 250-gpm at or above 2,000-psi will move solids to the downstream manhole in high flow conditions. The separation system will dewater solids to 95 % (passing a paint filter test) and transfer them to a dump truck, if needed, for transport to a water reclamation facility, approved landfill, or other location specified by the County or designee. Wash water will be filtered to a point where it can be used in the pump for continuous cleaning. No bypassing of sewer flows will be necessary. The

unit shall be capable of 24-hour operation and the unit shall not leave the manhole until a section is fully cleaned.

1.03 CAPTURE AND REMOVAL OF DEBRIS:

- A. The Contractor shall furnish equipment, either specialized or stand in the industry, for the purpose of preventing debris from being washed past the manhole, inlet, or outfall downstream of the line segment being cleaned, and for removing the debris from the structure before any damage is caused to the system performance and or system equipment such as pump/lift stations, check valves, flowways, etc. The cost of all system downtime and repairs to restore operational status resulting from construction debris damage that in the City's opinion was reasonably preventable will be borne by the Contractor.

1.04 QUALIFICATIONS

- A. Refer to Section 01001 General Work Requirements paragraph 1.01.A for sewer cleaning minimum qualifications.

1.05 SHOP DRAWINGS AND SUBMITTALS

- A. Submittals shall be submitted to the City for review and acceptance prior to cleaning.
 - 1. Schedule of work:
 - a. Work Schedule. This schedule shall outline the sequence in which the Contractor proposes to conduct his operations and shall be submitted to the City two weeks in advance of performing work and provide the City a reasonable opportunity to observed and inspect work. The Contractor shall use a time-scaled format listing each segment of sewer to be cleaned. The level of detail of activities shall provide clear, concise communication of the plan of work. At a minimum, activities showing initial mobilization, start-up, and cleaning.
 - b. Original and updated schedules must be provided to the City in writing. The software used for producing the schedules must have the capability to tailor the form and format of schedules, and accompanying reports, may be use of Microsoft excel, project with similar formats.
 - c. The City may require additional updates to the schedule as changes occur. These additional updates will be submitted to the City within 24 hours of the request. Changes to the schedule are subject to approval of the City.
 - d. Schedule is to be updated weekly
 - 2. Proposed cleaning equipment.
 - 3. SDS for chemical cleaning products to be used.
 - 4. **Cleaning log** in a format acceptable to the City for purposes of recording pertinent information relative to the storm water main and sanitary sewer main and structures being cleaned.
 - 5. Chemical root control agent shall be registered with the EPA and the State Department of Agriculture as a General Use Herbicide and shall be labeled for use in sanitary sewers to control tree roots.
- B. Post Cleaning submittal.
 - 1. Cleaning log including any pertinent information observed during cleaning.
 - a. A daily log shall be maintained to record the location of the manholes and sewer
 - b. lines, lengths of the lines cleaned, method of cleaning, line sizes, identify type of
 - c. cleaning (light, medium, or heavy), and type of debris moved. Observations are to be
 - d. recorded on a cleaning report form.

PART 2 - PART 2 - PRODUCTS – NOT USED**PART 3 - PART 3 - EXECUTION****3.01 GENERAL**

- A. The Contractor shall furnish and maintain, in good condition, all cleaning and equipment necessary for proper execution of the work.
- B. Maintaining Flow: It will be the responsibility of the Contractor, throughout the tenure of this contract, to provide and always maintain sufficient flow to pass any flash of storm flow of drainage ditches and prevent any backwater flooding due to obstruction caused by cleaning equipment.
- C. Refer to Section 01001, General Work Requirements paragraph 1.16.C for
 - 1. Notification of Public or Customers. No sewer or water service is to be shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.

3.02 SITE VISIT:

- A. The Contractor shall be responsible for conducting a physical reconnaissance of the area to be cleaned in order to verify the location of known and/or accepted manholes or inlets.
- B. The Contractor shall utilize a magnetic locator to attempt to identify the location of buried manhole covers and notify the City representative so that City personnel can excavate and bring the manhole up to grade prior to cleaning. Under no circumstances shall the Contractor excavate buried manholes without prior authorization from the City.

3.03 QUALITY ASSURANCE:

- A. Refer to Section 01101 article 3.03 and 304 for quality assurance and inspection requirements.

3.04 ISOLATION AND BYPASS OPERATIONS


- A. Refer to Section 01516 Collection System Bypass article 1.01 Scope of Work for sewer bypass requirements.

3.05 CLEANING PRECAUTIONS

- A. All necessary precautions shall be taken to protect the sewer from damage during all cleaning and preparation operations. Precautions shall also be taken to ensure that no damage is caused to public or private property adjacent to or served by the sewer or its branches. The Contractor shall pay for and restore, at no additional costs to the City, any damage caused to public or private property because of such cleaning and preparation operations.
- B. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools

which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant. All requirements shall be met when accessing a fire hydrant including but not limited to meters, backflow preventers, and properly trained personnel. It shall be the Contractor's responsibility to meet all state and local requirements.

3.06 HYDRAULIC CLEANING METHODOLOGY:

- A. High Velocity Cleaning Methodology: High velocity hydro-cleaning shall consist of cleaning and flushing of the sewer line by means of water pumped into the line at a high velocity. This shall be accomplished using approved equipment to deliver water to a self-propelled nozzle to do the necessary cleaning and flushing. As many passes as necessary shall be made to sufficiently clean the sewer line. 06-08-02020 Conformed 

3.07 MECHANICAL CLEANING METHODOLOGY:

- A. Rodding: Cleaning shall be with a power-driven continuous steel rod of sufficient length and gauge with the proper cleaning heads or augers, to loosen all solids or other materials. It shall also provide a means to thread a cable for the power winch.
- B. Bucket Machine: Removal of all solids, materials and other debris shall be by means of a clam-shell type bucket and/or other appliance dragged through storm water main or sewer line with power winches of suitable size and horsepower.
- C. Supplemental Cleaning: After all material has been removed by mechanical cleaning, a minimum of one pass using hydraulic cleaning methods shall be performed to ensure complete removal of material from the walls of the pipe. Any damage to pipes will be repaired.

3.08 SPECIAL CLEANING REQUIREMENTS FOR CAST IRON PIPE:

- A. After cleaning pipe of normal sewage deposits such as sand and grease by methods above, the pipe shall be cleaned of tuberculation, including rust build-up and mineral deposits. For pipe diameters greater than 24-inch, the Contractor may choose any equipment necessary to remove the tuberculation, such as a "pig" or rodder; For pipe diameters less than or equal to 24-inch, all tuberculations shall be removed using either a high pressure water blaster capable of delivering a minimum 40 gallons per minute at a pressure of 10,000 psi, mechanically or hydraulically driven chain flail, grinding chain cutters or other suitable means of removal of tuberculation. However, no equipment shall be used which may damage the pipe, manholes, street, or downstream pump stations without arranging emergency provisions to repair or replace the main being cleaned.

3.09 CLEANING

- A. If cleaning of an entire sewer section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning attempted again. If results of the cleaning are favorable, the Contractor will proceed with the TV inspection. All sludge, dirt, sand, rocks, and other solid or semisolid materials resulting from the cleaning operation shall be removed from the downstream manhole of the section being cleaned. The Contractor shall not be responsible for removing mortar or other material that is securely attached to the pipe walls or joints.

- B. Materials shall be disposed of from the site at least once at the end of each workday. The Contractor will be responsible for the disposal of materials removed from the sewer system. All sewer-cleaning efforts shall require documentation of all quantities and types of materials removed during cleaning.
- C. The designated sewer main shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment approved by the City. Cleaning shall consist of normal hydraulic jet cleaning to facilitate the internal CCTV inspection.
- D. Types of cleaning of sanitary sewers:
 - 1. Light cleaning of sewers consists of a maximum of 1 pass of the jet nozzle. Light cleaning of laterals will consist of flushing water into a cleanout. Resulting in removal of $\frac{1}{4}$ pipe diameter depth or less of sand and/or debris from a section of pipe. The removal of roots, barnacles/oysters and/or tuberculation would be considered a separate item.
 - 2. Medium cleaning of sewers consists of 2 to 4 passes of the jet nozzle. Medium cleaning of laterals will consist of 1 to 4 passes with a jet nozzle. Resulting in removal of greater than $\frac{1}{4}$ and up to and including $\frac{1}{2}$ pipe diameter depth of sand and/or debris from a section of pipe. The removal of roots and/or tuberculation would be considered a separate item.
 - 3. Heavy cleaning consists of 5 or more passes of the jet nozzle such as removing heavy grease and debris. Resulting in the removal of greater than $\frac{1}{2}$ pipe diameter depth of sand and/or debris from a section of pipe. The removal of roots and/or tuberculation would be considered a separate item. 06-08-2020 Conformed
 - 4. Descaling of Ductile/Cast Iron pipe: Multiple passes with mechanical equipment to remove scale build up to restore pipe to original inside diameter.
- E. Selection of the equipment used shall be based on the conditions of lines at the time the Work commences. The equipment and methods selected shall be satisfactory to the City. The equipment shall be capable of removing dirt, grease, rocks, sand, debris, other materials, and obstructions from the sewer lines, laterals, and manholes.
- F. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. The intent of preparatory cleaning is to provide sufficient cleaning to ensure camera passage and the internal conditions of the pipeline can be fully assessed.
- G. If the City establishes that a section of the pipeline cannot be adequately cleaned due to broken, collapsed, or void areas, then the inspection will be attempted up to the obstruction.

3.10 ROOT REMOVAL

- A. Roots shall be removed in the designated sections where root intrusion is a problem and where authorized by the City. Special attention should be used during the cleaning operation to remove roots from the joints. Any roots that could prevent the proper application of chemical sealants or could prevent the proper seating and application of cured-in-place liners shall be removed. Procedures may include the use of mechanical equipment such as, rodding machines, bucket machines, winches using root cutters, porcupines, chain-cutter, saw blade and equipment such as high-velocity jet cleaners. 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 the line. Reference Technical Specification 02766, Sanitary Sewer Obstruction Removal for further requirements regarding root removal. 06-08-2020 Conformed

3.11 CHEMICAL ROOT TREATMENT

- A. To aid in the removal of roots, main sections that have root intrusion shall be treated with an acceptable herbicide. The application of the herbicide 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 City, shall be replaced by the Contractor at no additional cost to the City. All safety precautions as recommended by the manufacturer shall be adhered to for handling and application of the herbicide. 06-08-2020 Confirmed
- B. The Contractor must always have a State Certified Pesticide Applicator on site when doing chemical applications.
- C. The Contractor shall take all steps necessary and appropriate to prevent adverse effect on wastewater treatment plant processes during the application process.
1. The active ingredient shall not adversely affect wastewater treatment plant processes.
- D.

3.12 STORM DRAIN OUTFALL BARNACLE/OYSTER REMOVAL

- A. Removal of barnacle, oyster or similar build up at the end of stormwater pipes shall be removed at the face of the stormwater outfall (i.e. Headwall) and up into the stormwater pipe a distance at least two times the existing pipe diameter. Additionally, all outfall pipe cleaning shall include cleaning of the headwall structure 24-inches around all pipe sizes. For example, a 36-inch stormwater pipe would be cleaned from barnacle, oyster or similar build up at least 72-inches into the pipe itself, and 24-inches around the outfall pipe on the headwall structure.

3.13 MATERIAL REMOVAL AND DISPOSAL

- A. All sludge, dirt, sand, rocks, grease, roots, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Contractor shall provide appropriate screening to stop passing of materials into downstream sewers. All solid or semisolid materials dislodged during cleaning operations shall be removed from the sewer by Contractor at the downstream manhole of the sewer section being cleaned. The passing of dislodged materials downstream of the sewer segment being cleaned shall not be permitted. In such an event, as observed or detected by the City or any third party, Contractor shall be responsible for cleaning the affected downstream sewers in their entirety, at no additional cost to the City.
- B. The Contractor shall be responsible for the disposal of all waste materials and shall transport waste materials to the nearest City Wastewater Treatment Plant for processing. City shall approve all waste material disposal schedules. The selected Contractor(s) shall be responsible for all waste material spills and clean-up in the loading, hauling and unloading of the Contractors equipment.
- C. The contractor shall be responsible for conforming to any and all requirements regarding hauling and disposal of waste from each work site in accordance with OSHA regulations and those that may be mandated by federal, state, or local governments. The contractor shall ensure that all waste material transporters possess all required federal, state and local regulations, including but without limitation, 40 CFR Part 263, "Standards Applicable to Transporters of Hazardous Waste" and Chapter 17-730, Part 3 Florida Administration Code, as may be amended from time to time.

- D. The Contractor shall keep his haul route and work area(s) neat, clean, and reasonably free of odor, and shall bear all responsibility for the cleanup of any spill.

3.14 ACCEPTANCE OF CLEANING OPERATION

- A. Acceptance of sanitary sewer and storm water pipe and structure cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the City. If television inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to re-clean and re-inspect the sewer line at no additional cost until the cleaning is shown to be satisfactory.
- B. In addition, on all sanitary sewers which have sags or dips, to an extent that the television camera lens becomes submerged during the television inspection, the Contractor shall use a high pressure cleaner to draw the water out of the pipe, or other means, to allow the full circumferential view of the pipe and identification of pipe defects, cracks, holes, and location of service connections.


END OF SECTION

SECTION 02762

TELEVISIONING SANITARY SEWER SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Work covered within this Section is for the internal closed-circuit television (CCTV) inspection of sanitary sewer pipes. The Contractor shall perform sewer-televising work as necessary to thoroughly document the condition of all sewers, service lateral connections, service laterals, and to a minimal extent manhole corbel, barrel and cone-sections in the study area. The sanitary sewer and service laterals shall be carefully inspected to determine alignment, grade variations, separated joints, location and extent of any deterioration, breaks, obstacles, obstructions, debris, quantities of infiltration/inflow and the locations of service connections. 06-08-2020 Conformed
- B. The quality of all Work specified in this Section shall meet or exceed the requirements of the  National Association of Sewer Service Companies (NASSCO) Recommended Specifications for Sewer Collection System Rehabilitation (latest edition), except as described in this Section. Applicable portions of this Section that inadvertently fall below those standards shall be corrected and maintained at the NASSCO standards as a minimum requirement, at no additional cost to the City.

1.02 REQUIREMENTS

- A. The Contractor shall inspect the sewer interior using a color closed circuit television camera (CCTV) and document the inspection on a digital recorder. All inspection video shall be captured in either MPEG or Windows Media Video (.WMV) file format and saved portable hard drives for submittal. Each inspected main line sewer segment referenced manhole to manhole, manhole to inlet, inlet to inlet, inlet or manhole to outfall, and each inspected sewer lateral referenced to the property address and corresponding sewer main should have an associated MPEG or WMV file. Digital photographs (.JPG files), inspection reports (.PDF files) and any handwritten inspection logs or field maps shall accompany the video inspections for each sewer reach (manhole-to-manhole) or lateral inspected.
- B. Contractor shall provide inspection video, data and reports in accordance with the requirements specified herein. Contractor shall provide all video on portable hard drive as specified. All Work will conform to current NASSCO Pipeline Assessment Certification Program (PACP) coding conventions and all software used by the Contractor will be PACP compliant. An electronic database will be provided by the Contractor in a PACP exported format approved by the City.
- C. The Contractor shall provide comments as necessary to fully describe the existing condition of the sewer on the inspection forms.
- D. Contractor shall be responsible for modifications to equipment and/or inspection procedures to achieve report material of acceptable quality.
- E. No Work shall commence prior to approval of the submitted material by the City. Once accepted, the report material shall serve as a standard for the remaining Work.

- F. Site to be restored to pre-inspection conditions.
- G. Contractor shall ensure that employee's vehicles display company logo on side doors and company phone numbers. No personal vehicles are to park at the job site.
- H. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

1.03 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

1.04 QUALIFICATIONS AND QUALITY

- A. Refer to Section 01101 General Work Requirements paragraph 1.01.A minimum CCTV work qualifications.

1.05 SUBMITTALS

- A. Submittals shall be provided to the City for review and acceptance prior to construction as listed and described in the individual General Requirements and Technical Specification sections. Work performed for which a submittal or shop drawing is required that has not been reviewed by the City or responsible agencies shall be considered installed at the Contractor's risk.
- B. Submittals associated with this section submitted under another Section.
 - 1. Refer to Section 01516 for by-pass pumping plan submittal.
 - 2. Refer to Section 02761 for SDS submittal.
 - 3. Work schedule refer to Section 02761, Cleaning Sanitary Systems, and article 1.05 for requirements.
 - 4. Maintenance of Traffic is covered in General Requirements Section 01570.
 - 5. Refer to Section 01101 paragraph 1.03 for CCTV video sample requirement.
- C. Submittals under this section.
 - 1. PACP certificate copies of all operators.
 - 2. Footage calibration report for each camera used.
 - 3. Work schedule refer to Section 02761, Cleaning Sanitary and Storm Sewer Systems, and article 1.05 for requirements.
 - 4. Maintenance of Traffic is covered in General Requirements Section 01570.
- D. The following deliverables shall be submitted on a portable hard drive at the completion of inspection:
 - 1. Sanitary sewer main and lateral pre- and post- work inspection videos saved in MPEG format or Windows Media video format
 - 2. Electronic version (.pdf) of the pipe inspection reports
 - 3. PACP export pipe inspection database (.mdb)
 - 4. Inspection digital photographs in JPEG format
 - 5. Map of sub area depicting area inspected, inspection status, asset identification numbers and mark ups

6. QA/QC report.
 7. Main and Lateral defect repair recommendations for each pipe segment.
- E. The above deliverables shall be submitted monthly, or shorter frequency depending on the duration of the work order, to the City for approval. Application for payment shall be made after review and approval by the City.
- F. The sewer inspection video, report documents, and sewer inspection database shall be in accordance with City data standards and NASSCO PACP.

1.06 NOTIFICATION

- A. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained that the business is open. No sewage from the services or main line shall be discharged on the ground or in waterways.

PART 2 - PRODUCTS

2.01 EQUIPMENT

- A. Closed Circuit Television Camera: The television camera used for the inspection shall be one specifically designed and constructed for sanitary sewer inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100 % humidity/submerged conditions. The CCTV camera equipment will provide a view of the pipe ahead of the equipment and of features to the side of the equipment through turning and rotation of the lens. The camera shall be capable of tilting at right angles along the axis of the pipe while panning the camera lens through a full circle about the circumference of the pipe. The lights on the camera shall also be capable of panning 90° (degrees) to the axis of the pipe.
- B. The radial view camera must be solid-state color and have remote control of the rotational lens. The camera shall be capable of viewing the complete circumference of the pipe and manhole structure, including the cone-section or corbel. Cameras incorporating mirrors for viewing sides or using exposed rotating heads are not acceptable. The camera lens shall be an auto-iris type with remote controlled manual override.
- C. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment. The camera unit shall have sufficient quantities of line and video cable to inspect 2 complete, consecutive sewer reaches with access approximately 750-feet apart.
- D. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the City. The television camera, electronic systems and monitor shall provide an image that meets the following specifications, or approved equal:
1. The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five stages.
 2. With the monitor control correctly adjusted, the 6-colors; Yellow, Cyan, Green, Magenta, Red, and Blue, plus black and white shall be clearly resolved with the primary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray

- with no color tint.
- 3. The picture shall show no convergence or divergence over the whole of the picture. The monitor shall be at least 13-inches diagonally across the picture tube.
- 4. The live picture on the CCTV monitor shall be capable of registering a minimum of 500 lines horizontal resolution and be a clear, stable image with no interference.
- 5. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear in-focus picture of the entire inside periphery of the sewers and laterals for all conditions except submergence. Under ideal conditions (no fog in the sewer) the camera lighting shall allow a clear picture up to 5 pipe diameter lengths away for the entire periphery of the sewer. The lighting shall provide uniform light free from shadows or hot spots.
- 6. The camera light head shall include a high-intensity side viewing lighting system to allow illumination of internal sections of lateral sewer connections.
- 7. Camera focal distance shall be remotely adjustable through a range of 6-inches to infinity.
- 8. Picture quality and definition shall be to the satisfaction of the City.
- 9. The monitor and software shall also be able to capture and save screen images of typical sewer details and all defects. Screen images shall be embedded into the pipe inspection report document submitted with the inspection video.
- 10. The video camera shall be capable of displaying on screen data as specified in paragraph 3.08 herein.
- 11. Depth gage: The camera shall have a depth gage or approved method to measure deflection in the pipe and joint separation approved by the City. The camera shall have zoom capabilities to be able to view the entire depth of a 20-foot deep manhole from the bottom during inspection.
- 12. The camera lens shall be kept clear of condensation and debris during the CCTV inspection.
- 13. Camera equipment must have independent lab approval for use in Class 1, Group 0 Hazardous locations per NFPA.

E. Lateral Video Camera

- 14. Refer to Technical Specification Section 02763, Television Sanitary Sewer Laterals, article 1.04 for equipment requirements.
- 2. Lateral cameras may be push type or launched from the sewer main line. Lateral cameras shall be color, shall be self-leveling, and equipped with a footage counter to provide on-screen display of footage measurement. Monitor resolution shall be as in accordance with paragraph 1.04 of Section 02763 or approved equal

F. Video Capture System

- 1. The video and audio recordings of the sewer inspections shall be made using digital video equipment. A video enhancer may be used in conjunction with, but not in lieu of, the required equipment. The digital recording equipment shall capture sewer inspection on hard drive, with each sewer reach inspection recorded as an individual movie file (.MPEG, .MPG, or .WMV) or approved equal. The video files will be named in accordance with the City file naming convention contained in paragraph 3.11 herein.
- 2. The video file names will be referenced in the inspection database and in an inspection, report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided.
- 3. The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection

reports with captured images of defects or other related significant visual information on a standard color printer.

4. The imaging capture system shall store digitized color picture images and be saved in digital format on a hard drive or approved equal. Also, this system shall have the capability to supply the City with inspection data reports for each line segment.
5. The Contractor shall have the ability to store the compressed video files in industry standard and approved City format and be transferable with the PACP compliant inspection database.
6. The Contractor's equipment shall have the ability to "Link". "Linking" is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.
7. The system shall be able to produce data reports to include, at a minimum, all observation points and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions
8. The data-sorting program shall be capable of sorting all data stored using generic sort key and user defined sort fields.
9. Camera footage, date & manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage display at the control console. All manhole references will be based on the Cities Facility ID number.
10. Digital video shall be defined as ISO-MPEG Level 1 (MPEG-1) coding having a resolution of 352 pixels (x) by 240 pixels (y) (minimum) and an encoded frame rate of 29.97 frames per second. The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise to produce an oral report that is clear and discernible.
11. Inspection software shall be PACP compliant versions of CUES Granite XP, WinCan, Flexidata, or approved equal.
12. The CCTV equipment/software shall be capable of producing digitized images of all sewer line defects, manhole defects, and sewer line service connections in .jpeg format. Contractor shall plan to take digital still images of each defect, construction features and service connection to clearly depict it. More images may be necessary depending upon the condition of the pipe.

2.02 DIGITAL CAMERA FOR REMOTE INSPECTIONS

- A. All manhole photographs required as part of this specification shall be obtained using a minimum 4-megapixel digital camera with strobe flash capable of producing digital images with minimum resolution of 2240 x 1680.

2.03 REPORTING CAPABILITIES

- A. The CCTV system shall be capable of printing pipeline inspection reports with pipeline schematics and captured images of defects and other related significant visual information. The system shall have the ability to display any combination of the following formats and features simultaneously.
- B. The following information is mandatory for all inspections:

- 2.03.1.1 Inspection Information: Refers to the area of pipe to be inspected between 2 man-holes or the address of the lateral to be inspected.
 - 2.03.1.1.1 Project Name
 - 2.03.1.1.2 Surveyed by (Operator/Surveyor's name)
 - 2.03.1.1.3 Operator/Surveyor Certificate number
 - 2.03.1.1.4 System Owner
 - 2.03.1.1.5 Date
 - 2.03.1.1.6 Main segment number. Segment numbers will be provided with each proposal request.
 - 2.03.1.1.7 Drainage Area (tributary pump station number)
 - 2.03.1.1.8 Time
 - 2.03.1.1.9 Sheet number (report sheet number)
 - 2.03.1.1.10 Street Name and Number
 - 2.03.1.1.11 Locality (City of St. Augustine (COSA))
 - 2.03.1.1.12 Additional Location Information (e.g. backyard, parking lot, etc.)
 - 2.03.1.1.13 Upstream Manhole Number (City standard Facility ID Number)
 - 2.03.1.1.14 Upstream MH rim to invert (depth)
 - 2.03.1.1.15 Downstream Manhole Number (City standard Facility ID Number)
 - 2.03.1.1.16 Downstream MH rim to invert (depth)
 - 2.03.1.1.17 Direction of inspection (Upstream or Downstream)
 - 2.03.1.1.18 Flow control (e.g. plugged, lift station, bypassed, not controlled)
 - 2.03.1.1.19 Type of Pipe
 - 2.03.1.1.20 Pipe Height
 - 2.03.1.1.21 Pipe Width
 - 2.03.1.1.22 Pipe Shape
 - 2.03.1.1.23 Pipe Material
 - 2.03.1.1.24 Lining Material (for lined sewers)
 - 2.03.1.1.25 Pipe Joint Length
 - 2.03.1.1.26 Purpose of Inspection (Condition evaluation, new line, CIP R/R project, etc.)
 - 2.03.1.1.27 Pre-Cleaning (jetter, heavy cleaning, no pre-cleaning)
 - 2.03.1.1.28 Media Number (Video file name)
 - 2.03.1.1.29 Weather
 - 2.03.1.1.30 Additional information/Comments
- 2.03.1.2 Observation Data: Refers to the portion of pipe where an observation is discovered. Observations shall be noted by text descriptions and defect code number using PACP defects codes, still frame pictures and video clips captured and recorded. Each observation shall include the following:
 - 2.03.1.2.1 Actual observation footage
 - 2.03.1.2.2 Video reference
 - 2.03.1.2.3 Location of defect; clock position
 - 2.03.1.2.4 Code (Group/Descriptor/Modifier/Severity)
 - 2.03.1.2.5 Whether it is a continuous defect
 - 2.03.1.2.6 Whether the defect occurs at a joint
 - 2.03.1.2.7 Severity level
 - 2.03.1.2.8 video counter location
 - 2.03.1.2.9 Final footage
 - 2.03.1.2.10 Video clip ID for each observation
 - 2.03.1.2.11 Image reference (file name of photos)
 - 2.03.1.2.12 Remarks (as appropriate or needed)
- 2.03.1.3 Formats: Standard and/or custom designed reports shall have the following formats available and shall be able to be produced in hard copy or viewed on the monitor.

- 2.03.1.3.1 Site Observation: Displays detailed site observation reports in landscape or portrait views.
- 2.03.1.3.2 Directory Report: Displays a list of all the projects sorted by pump station number and manhole number.
- 2.03.1.3.3 Picture Reports: Displays site data and include full size single photos or half size double photos of discrepancies.
- 2.03.1.3.4 Pipe Run: Displays a graphical display of the site indicating footage, observations, and comments.
- 2.03.1.3.5 Project Data: Displays the project, client, and Contractor information.
- 2.03.1.3.6 Custom Sort: Creates user-defined reports of selected site, project, and observation data.

PART 3 - EXECUTION

3.01 GENERAL

- A. Work notices are to be provided to property owners 48 hours prior to beginning work. A copy of the notices will also be provided to the City at the time they are provided to property owners.
- B. Prior to inspection the Contractor shall obtain pipe and manhole asset identification numbers from the City to be used during inspections. Inspections performed using identification numbers other than the City assigned numbers will be rejected.
- C. Inspection shall not commence until the sewer section to be televised has been completely cleaned in conformance with Specification Section 02761 "Cleaning Sanitary Sewer Systems."
- D. Inspection of newly installed sewers (not yet in service) shall not begin prior to completion of the following:
 - 1. Pipe air testing
 - 2. All manhole work, including installation of inverts
 - 3. Installation of all lateral services
 - 4. Vacuum tests of all manholes
- E. After the sewer main and/or lateral cleaning operation is completed, the line sections shall be visually inspected internally by means of color closed-circuit television. The television inspection shall be performed one-line segment at time.
- F. CCTV inspection shall require a minimum of 1 certified personnel with PACP certifications.
 - 1. One (1) person shall have PACP certification that will lead or supervise each field CCTV crew for inspection and a minimum of 2-years in the role of a lead person.
 - 2. This person shall also have experience in the role as a QA/QC management supervisor
- G. Contractor shall perform sewer-televising work within 24-hours of said sewer being cleaned. If said sewer is not televised within the required 24-hour time limit, the sewer shall be re-cleaned prior to televising at no additional expense to the County.
- H. The Contractor shall also inspect and document all manholes included in this Work. The video recording shall begin as the camera is lowered down the manhole all the way to the preset footage and continuously throughout the pipe reach until the downstream manhole is reached.

- I. The Contractor shall lower the camera into the start manhole and record the camera entry into the sewer, observing the manhole as the camera enters.
- J. Main diameter is to be physically measured in the up or downstream manhole and documentation of this is to be included in the CCTV video record.
- K. The camera shall pan the periphery of the start and finish manhole from casting to invert. To achieve this, the CCTV camera operator shall pan and zoom the manhole to obtain the best possible image of the manhole, including the wall, cone and chimney section(s).
- L. The depth of each manhole shall be measured to the nearest 1/10th of a foot and documented on the inspection forms. Estimates of manhole depths will not be accepted.
- M. The CCTV camera shall be positioned as close to the spring line as possible while maintaining the required equipment stability.
- N. Wherever possible the inspections shall be performed in the upstream to downstream direction. All sewer segments shall be recorded in a logical order in the same direction they are cleaned and televised.
- O. If access to some manholes is restricted, permission may be granted by the City to direct the camera through the sewer in an upstream direction, against the flow.
- P. When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and Contractor shall televise the line from the opposite direction.
- Q. The camera shall be directed through the sewer in a downstream direction, with the flow, at a uniform, slow rate. In no case will the video camera record while moving at a speed greater than 30-feet per minute. If, during the Project, the inspection is rejected due to camera speeds exceeding 30-feet per minute, the inspection recordings shall be redone, at no additional cost to the City.
- R. If a new manhole is discovered in the field that was not on current maps, a new manhole identification number will be assigned by City. The City shall assign the manhole the next number above the highest manhole number within the sub area. The data / video files shall then be re-named to include the new MH ID, and a new CCTV inspection shall be started from the new MH ID. Contractor shall consult with the City for assignment of new manhole identification numbers. Contractor shall note in the inspection form comments that a new manhole ID has been assigned as well as provide a marked-up map indicating the newly found manhole and assigned manhole ID.
- S. Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the Work during low flow periods or other methods like plugging and bypass pumping shall be implemented.
- T. For inspection of new sewers (not yet in service), the Contractor shall introduce clean water into the upstream manhole and keep water flowing until flow is observed at the downstream manhole location.
- U. The survey unit shall be slowed, stopped, or backed up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature,

the operator shall pan the camera to the area and along the circumference of the pipe. Recording shall document broken sections, root intrusion, miss-aligned joints and other defects for a minimum of 5 seconds.

- V. The camera unit shall be paused long enough at areas suspected of leaking to determine if a leak exists currently or if deposits have occurred.
- W. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data.
- X. Digital photographs or screen captures shall be taken at all laterals; defects and general condition photographs shall be taken at least every 200-feet.
- Y. At the Contractor's discretion or direction of the City, the camera shall be stopped or backed up (when conditions allow) to view and analyze conditions that appear to be unusual or uncommon for a sound sewer. The lens and lighting shall be readjusted, if need be, in order to ensure a clear, distinct, and properly lighted feature.
- Z. Audio shall be recorded during each inspection by the operating technician, electronic voice text recognition or approved equal on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. Voice descriptions should be made:
 - 1. At points of pipe failure or weakness
 - 2. At points of infiltration
 - 3. At the location of service connections
 - 4. At points where unusual conditions are noted, and
 - 5. At points where digital still photos are taken.
- AA. In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio dubbing after the inspection is prohibited.
- BB. Video recordings shall include a continuous video display/readout of similar information, as described in paragraph 3.08 herein. A separate digital video file shall be made for each pipe reach inspected. To the extent practical there should be one video recording per segment. Multiple videos will only be accepted when pipe condition along the entire length of segment requires extensive defect documentation.
- CC. Contractor shall coordinate with the City prior to commencement of Work to ensure inspection is accomplished in a manner acceptable to the City.
- DD. If the video and/or audio recording is of poor quality, the City has the right to require a re-submittal of the affected sewer sections and no payment will be made until an acceptable video and audio recording is made, submitted to, and accepted by the County.

- EE. Measurement for location of defects and actual length of pipe shall be by means of a calibrated meter on the camera with a digital readout on the video monitor. This readout shall be included in the video recording. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement will be accurate to 1-foot per 100-feet of inspected pipe.
- FF. The distance shall be measured between the exit of the start manhole and the entrance of the finish manhole for a true measurement of the length of the pipe segment, as required by PACP. It shall be recorded in standard units and the video display readout shall display units to one-tenth of a foot.
- GG. The Contractor inspection units shall be equipped with adequate back up equipment and spare parts so field repairs to equipment can be made and down time is minimized.
- HH. The Contractor shall be responsible for all traffic control measures required to perform the Work.
- II. Lateral inspections shall be performed from the main line using a lateral launch camera or shall be pushed from cleanouts to the sewer main using sewer rods. Lateral camera travel measurements shall be displayed on screen and on the captured video.
- JJ. If lateral inspections are performed from the sewer main as part of the main line inspection, the lateral shall be logged in the main line inspection report per PACP requirements and the "comment" field of the main line inspection report shall be used to document the lateral identification number, defects observed, footage of all lateral defects, connecting pipes and clean outs. If lateral inspections are not performed as part of the main sewer inspection, a separate PACP pipe inspection record shall be created for each lateral. Refer to paragraph 3.10 for numbering requirements.

3.02 QUALITY ASSURANCE

- A. Refer to Section 01101 article 3.03 and 304 for quality assurance and inspection requirements.

3.03 PRE-CONSTRUCTION INSPECTION

A. Procedure

1. Prior to any repair work, the entire sewer line (from manhole to manhole) shall be televised. The pre-construction inspection shall be used to determine whether the line has been cleaned sufficiently; to confirm the location and nature of defects; and to confirm that the proposed method of repair is proper method for the defects observed.
2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30-feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole (reverse set-up).
3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the 2

manholes of the section being inspected to insure good communication between members of the crew.

4. The importance of accurate distance measurements is emphasized. The location of defects shall be within ± 1 feet.
5. During the internal inspection the television camera shall be temporarily stopped at each defect along the line. The Contractor shall record the nature and location of the defect. Where defects are also active infiltration sources, the rate of infiltration in gallons per minute shall be estimated by the Contractor and recorded. The camera shall also be stopped at active service connections where flow is discharging. Flows from service connections that are determined to be infiltration/inflow shall also be recorded.
6. Suspect Lateral Connections to Mainline.
 - a. Pan and tilt all service lateral connections to the mainline. Locate clean-out by property line, and if found record the addresses. Identify service connection locations, e.g. left, right, crown, and record lateral distances from the entry manhole in the mainline.
 - b. Used the Pan and Tilt camera to inspect each service lateral connection and document and visible service connection defects from mainline.
 - c. Check for flow in each service lateral connection. If flow is detected in the service lateral connection, follow steps d. to h. If no flow is detected in the service lateral proceed to the next service lateral survey.
 - d. Wait 3 to 5 minutes.
 - e. If flow is clear and does not subside, follow steps f to i. If flow subsides or is murky proceed to step g.
 - f. Check the water meter. If meter is running, proceed to step g. If the meter is not running proceed to step h.
 - g. Domestic Flow – Calculate flow from water meter reading and make entry in CCTV Video log.
 - h. Suspect Service Lateral – Estimate flow, make entry in the CCTV video log.
 - i. Continue mainline inspection.

B. Documentation of Television Inspection

1. Television Inspection Logs: Printed location records shall be kept by the Contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, and other discernible features will be recorded, and a copy of such records will be supplied to the City. The Contractor shall record all visuals observations on a "Television Inspection Report" form.
2. Once recorded, the digital data shall be labeled and become the property of the City. The Contractor shall have all readings and necessary playback equipment readily accessible for review by the City during the Project.

3.04 POST CONSTRUCTION INSPECTION

A. Procedure

1. After the sewer line rehabilitation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether all the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
2. The camera shall be moved through the line in either direction at a moderate rate, stopping

when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30-feet per minute. Manual winches, power winches, TV cable, power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole or direction. (reverse setup)

3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the 2 manholes of the section being inspected to insure good communication between members of the crew.
4. The importance of accurate distance measurements is emphasized. The location of defects shall be within 1-foot.
5. During the internal inspection the television camera shall be temporarily stopped at each repair. The camera shall also be stopped at any unnoticed or non-repaired point source of infiltration.

3.05 SEWER BYPASSING AND DEWATERING

9. Refer to General Requirement Section 01516, Collection System Bypass, article 1.01 Scope of Work for sewer bypass requirements.

3.06 LINEAR MEASUREMENT

- A. The CCTV camera location footage counter shall be zeroed at the beginning of each inspection. The survey unit location entered on the footage counter at the start of the inspection shall allow for the distance from the accepted start of the length of the sewer to the initial point of observation of the camera (pre-set footage). In the case of resuming an inspection at an intermediate point within a sewer reach, the footage counter shall be set to start at the distance from the upstream maintenance hole to that point, as previously recorded by the counter. The Contractor shall ensure that the footage counter starts to register immediately when the survey unit starts to move.
- B. The lateral camera shall be pushed from cleanouts to the sewer main and be equipped with a footage counter to display and record inspection footage. Maximum rate of travel shall be 30-feet per minute when recording.
- C. Prior to commencing inspections, the Contractor shall demonstrate compliance with the linear measurement tolerance specified below:
- D. The equipment shall measure the location of the camera unit in 1-foot increments from the beginning (upstream end) of each continuous section. This footage location must be displayed on the CCTV monitor and recorded on the videotapes.
- E. The accuracy of the measured location shall be within + 0.5% of the actual length of the sewer-reach being surveyed, or 1-foot, whichever is greater.

3.07 MEASUREMENT OF SAGS

- A. The CCTV camera shall be equipped with a measuring device capable of accurately measuring the depth of standing water up to 3-inches. The measuring device shall be mounted to the front of the unit and be capable of being read as the unit advances through the pipe.

3.08 CCTV MONITOR DISPLAY

- A. The images displayed on the CCTV monitors will be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.
- B. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. In order to ensure color constancy, no variation in illumination shall take place during the survey.
- C. The video equipment shall be checked using an approved test card with a color bar prior to commencing each day's survey. The camera shall be positioned centrally and parallel to the test card at a distance where the full test card just fills the monitor screen. The card shall be illuminated evenly and uniformly without any reflection.

3.09 DATA DISPLAYS

- A. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture.
- B. The on-screen display should be white during inspections where the background behind the display is dark and, conversely, black where the background is light.
- C. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:
 - 1. Date of survey
 - 2. Inspection company name and inspector
 - 3. Street name or location
 - 4. Manhole number to manhole number (in order of inspection)
 - 5. Direction of survey (upstream or downstream)
 - 6. Time of start of survey
- D. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors:
 - 1. Survey unit location in the sewer line in feet and tenths of feet from adjusted zero
 - 2. Sewer diameter
 - 3. Upstream and downstream manholes reference numbers as per approved Drawings or City GIS.
 - 4. During Lateral inspections the video display shall contain the lateral location and the footage of the camera within the lateral.

3.10 PHOTOGRAPHS

- A. During CCTV inspections, screen captures will be taken from the monitor images and saved electronically by the in-sewer inspection crew of typical conditions every 200-feet and at all defects, construction features, manholes and laterals. The screen capture shall have the pipe reach (identified by the upstream and downstream manholes), survey direction, footage, and date when photograph was taken. The annotation shall be clearly visible and in contrast to its background, shall have a figure size no greater than 1/4-inch, and shall be type-printed. The annotation shall be positioned on the front of the photograph to not interfere with the subject of the photograph. Photograph files shall be named by the video capture system and automatically referenced to the logged defect.
- B. The image of the sewer shall fill the photographic image. Photographs must clearly and accurately show what is displayed on the monitor, which shall be in proper adjustment. Where significant features exist within 6-feet of each other, 1 photograph shall be made to record these features. Where there is a continuous feature, photographs shall not be taken at intervals of less than 6-feet unless necessary to show a change in the feature.
- C. JPEG images shall be captured at a minimum resolution of 1024X768 pixels.
- D. The images shall be kept electronically, copied to a hard drive, and submitted with the inspection videos, database and reports.

3.11 MANHOLE NUMBERING, INSPECTION FORMS AND DEFECT CODES

- A. The Contractor will be required to use the manhole numbering as shown on sewer maps provided by the City when performing the inspections for this project. These numbers are based on the Facility ID the City maintains in their graphics database.
- B. Inspection forms, defect codes, inspection database and inspection protocols used for documentation of CCTV work shall be in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).
- C. When lateral inspections are performed as part of the main sewer inspection, lateral numbers shall be referenced in the "comment" field of the main sewer PACP report. The lateral number shall be as follows:
- D. When lateral inspections are not performed as part of the main sewer inspection, the main sewer inspection shall be performed first to obtain the footage and clock positions needed to identify the lateral.

3.12 DELIVERABLES

- A. The Contractor will be required to submit the following deliverables at the completion of the post construction video inspection. The pre-construction video inspection deliverables shall be as defined in 3.03 of this specification.
- B. Inspection Reports to include:
 - 1. Inspection session header information (see required fields above)
 - 2. Defect log report including photo captures from CCTV video

3. Schematic drawing of pipe showing defects
4. Format:
 - a. Adobe Acrobat PDF files: 1 report PDF per pipe
 - b. Main sewer inspection report file name:

<From MH ID>_<To MH ID>_<Date (year_mo_day format)>.PDF

Example: 30060002_30060001_2018_01_16.pdf

- c. Lateral inspection report file name:

<Upstream MH ID>_<footage>_<clock position>_<L>_<Date (year_mo_day format)>.PDF_

Example: 30060002_210_02_L_2010_02_16.pdf

- C. Inspection video files on portable hard drive, typed labels shall be attached to the face of each hard drive. The typed index labels shall include the following information:

1. Content (CCTV)
2. Contractor name
3. Purpose of Survey
4. Tributary Pump station number
5. Reaches included (from Manhole Number ## to Manhole Number ##)
6. Date of survey
7. Contract Number / Delivery Order Number (if applicable)

- D. Main sewer video files shall be MPEG or Windows Media File named according to the following standard:

<Upstream MH ID>_<Downstream MH ID>-<Inspection>_<Date (year month day)>.wmv

Example: 39540008-39540007_20090805.wmv

- E. In instances where a reverse set up is necessary to perform or complete the inspection the file name shall incorporate a "R" at the end of the file name to indicate "reverse" direction. Using the file example above, if the inspection from the upstream end was halted due to an obstruction and the pipe was televised from the opposite end, the video file from the downstream to upstream direction would be assigned the following file name:

Example: 39540008-39540007_20090805_R.wmv

- F. Lateral connection inspection video files shall be MPEG or Windows Media File named according to the following standard:

<Upstream MH ID>_<footage>_<clock position>_<L>_<date (year_mo_day format)>.wmv

Example: 39540008_145_10_L_2009_08_05.wmv

- G. Electronic Inspection Data stored and exported in a NASSCO Pipeline Assessment and Certification Program (PACP) compliant Microsoft Access database (.MDB) version 4.4 or newer delivered on portable hard drive.

- H. Inspection photograph digital files (jpeg) indexed to NASSCO PACP compliant database.

- I. Map of sub area depicting area inspected, inspection status, asset identification numbers and mark ups,
- J. Acceptable media for the video recordings portable hard drive.
- K. Inspection data noted above shall be provided to the City weekly throughout the inspection work.
- L. Contractor Quality Control report detailing data validation performed, pipe inspection records reviewed and results.
- M. All inspection data shall be submitted on a portable hard drive. Each hard drive shall be filled with as much data as practical to minimize the number of hard drives submitted. Sections of a single segment of sewer main shall not be recorded to more than 1 hard drive. Video footage of recorded segments shall be grouped by area and shall be submitted in sequential order relating to the area mapping designation.
- N. Upon approval by the City of all, or portions of, the data delivered via the portable hard drives, the approved CCTV data shall be delivered to the City on a portable hard drive labeled with project information. The hard drive shall clearly indicate the date of the inspection, the designated segment(s) of sewer mains(s) contained on the disk, the name of the project, the project CIP number, the pump station number, and Contractor name. The hard drive shall contain separate digital files for each manhole-to-manhole section.
- O. The database shall be comprehensive for the entire project, and additional data shall be added to the database each week.

3.13 ACCEPTANCE

- A. Inspection deliverables will be validated to check conformance with the specified requirements for file names, formats, quantity, and resolution, data table references, in addition to checks for null fields, asset numbers, duplicate records, connectivity, material, size, and depth. Any data not passing the data validation checks will be returned to the Contractor for resubmittal.
- B. Inspection submittals will be reviewed for quality control. A minimum of 5% of the submitted inspections will be randomly reviewed. A quality control check will be performed for each CCTV operator and each operator must exceed 90% accuracy. Reference Section 01101 "Special Requirements (Gravity Inspection Only)."
- C. Throughout the duration of the project, should the City discover inaccuracies in data or quality issues with any of the videos, Contractor shall re-inspect those segments at no additional cost to the City. The City will provide comments regarding acceptance of the data within 21-days of receiving the data from the Contractor. Neither the CCTV inspections nor the WORK inspected is accepted by the City until such time that an acceptance letter is issued by the City.

END OF SECTION

SECTION 02763

TELEVISIONING SANITARY SEWER LATERALS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. The Work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services and technical competence for performing all operations required to execute the internal closed-circuit television (CCTV) inspection to inspect service lateral after lateral clean outs have been installed.
- B. The CCTV inspection shall show all defects and determine amount of infiltration entering the service laterals.
- C. The post CCTV lateral inspection shall also be performed for any laterals after the laterals have been lined or replaced.

1.02 GENERAL

- A. After cleaning as specified in Section 02761 "Cleaning Sanitary Systems" (including special cleaning involving the mechanical removal of roots, grease, and/or tuberculation where authorized), and before and after repair/replacement work, the lateral shall be visually surveyed by means of closed-circuit television. The CCTV inspection shall be performed 1 lateral at a time.
- B. Pre and post construction survey video shall be delivered to the City on a portable hard drive accompanied with the corresponding TV logs for sewer laterals surveyed. The video shall be direct from a live video source into a video file, MPEG or Windows Media File format and of good quality for viewing. The recording of multiple laterals on a single hard drive is acceptable.
- C. **RESPONSIBILITY FOR OVERFLOWS AND SPILLS**
 - 1. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.
- D. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

1. SOFTWARE

- A. The Contractor shall utilize a NASSCO Pipeline Assessment Certification Program (PACP compliant software to capture the lateral inspections), unless otherwise approved by the City.

1.04 EQUIPMENT

- A. The television camera used for the lateral survey shall be one specifically designed and constructed for such survey. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum 700-line resolution color video picture. The Contractor shall always maintain the camera in clear focus. Picture quality and definition shall be to the satisfaction of the City, and if unsatisfactory, equipment shall be removed and replaced with adequate equipment at no additional cost to the City.
- B. The camera used from a cleanout shall be able to be launched from the cleanout and travel down to the sewer mainline up to 100-feet. The camera system shall be able to inspect 3, 4, and 6-inch lateral connections.
- C. The video camera shall include a titling feature capable of displaying on the video the following information.
 - 1. City
 - 2. Date/Time
 - 3. Contractor's Name
 - 4. Collection Basin and main segment number.
 - 5. Pipe Size (Diameter) and Material
 - 6. Lateral ID by property address or subdivision and parcel number.
 - 7. On-going Footage Counter

1.05 QUALIFICATIONS

- A. Refer to Section 01001 General Work Requirements paragraph 1.01.C for lateral CCTV work minimum requirements.

1.06 SHOP DRAWINGS AND SUBMITTALS

- A. Submittals shall be submitted to the City/Professional for review and acceptance prior to construction in accordance with article 1.05 of Specification 02761, Cleaning Sanitary Sewer Systems.
- B. The Contractor's submittals shall include description of the software to be used and a sample of the video titles to be used, along with a sample of the television survey log to be used.

1.07 NOTICES

- A. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground

or in waterways.

2. PRODUCTS

2.03 MATERIALS

- A. All inspection information and data (including video) shall be written to digital media (portable hard drive).
- B. All inspection information and data (including video) shall be written to digital media (DVD or portable hard drive).

PART 3 - EXECUTION

3.01 QUALITY ASSURANCE:

- A. Refer to Section 01101 articles 3.03 and 3.04 for quality assurance and inspection requirements.

3.02 ISOLATION AND BYPASS OPERATIONS

- A. Refer to General Requirements Section 01516, Collection System Bypass for isolation and bypass requirements.

3.03 PRE-CONSTRUCTION SURVEY

- A. A. Procedure
 - 1. Prior to any repair work, the entire service lateral (from mainline to property line or cleanout, whichever is farther from the mainline) shall be televised.
 - 2. Measurement for location of defects shall be above ground by means of a meter, roll-at-tape, or other suitable device. Linear footage shall be shown on screen during recording.
 - 3. Movement of the television camera shall be temporarily halted for a minimum of 10-seconds at each visible defect or point of flow until the source and flow rate from that point are determined.
 - 4. The inspection shall be performed from either the main sewer or the cleanout with the proper equipment.
 - 5. Suspect Service Lateral Protocol refer to Section 02762 paragraph 3.03.A.6 suspect lateral inspection from mainline.
 - a. If it is determined that the lateral is suspect based on the results of the inspected conducted under Section 02762 proceed with the follow lateral protocol.
 - b. Suspect Lateral Protocol – Use lateral camera to inspect suspect lateral from either the mainline to the property line or from the clean-out at the property line, if found, to the mainline. Record all observations such as presence of roots, breaks, infiltration, tuberculation, corrosion, collapsed pipes and any other defects within the line. Include the video of this survey with the

B. B. Field Documentation

1. Television CCTV Logs: The Contractor shall provide lateral identification numbers using either the property address or subdivision and parcel number. All inspection logs shall reference the applicable lateral ID. In addition, the upstream manhole number, distance from the upstream manhole, lateral connection to the main line (left, center or right), and address of the customer serviced by the lateral shall be noted on the television survey log. Inspections shall be recorded in NASSCO PACP/Lateral Assessment Certification Program compliant software unless otherwise approved by the City. Reports shall be generated from the software. Printed and electronically stored location records shall be kept by the Contractor and will clearly show the location in relation to the cleanout or the mainline of each infiltration point observed during survey. Footage shall be shown on the log. In addition, other points of significance such as unusual conditions, roots, broken pipe, presence of scale and corrosion, and other discernible features will be recorded, and a copy of such records will be supplied to the City.
2. Photographs: Digital photographs of the television picture of problems shall be taken by the Contractor upon request of the City.
3. Video Recordings: Individual video files shall be created for each lateral inspected. Each file shall be in MPEG or Windows Media video format. Video files shall be named with the lateral ID and date of inspection. Video files shall be submitted on a portable hard drive. The purpose of video recording shall be to supply a visual and audio record of problem areas in the lines which may be replayed. Once recorded, the video shall become the property of the City.
4. Audio: All lateral inspection videos shall have an audio record. As a preamble, at the beginning of the inspection, the Contractor shall state the following "(Contractor's Name) is performing a pre/post TV survey of laterals for (each sub area)". State date, time, operator's name, area, pipe size and material, upstream City asset manhole number (Facility ID), and depth. The Contractor shall verbally state the position of the lateral with respect to the upstream manhole and describe defects. At the end of each line, state: "end of line and total linear footage".

3.04 POST CONSTRUCTION SURVEY

A. A. Procedure

1. The same procedure shall be used as indicated in sub-section "3.03 Preconstruction Survey."
2. In addition, the Contractor shall stop the camera at all point repairs and inspect entire repaired pipe sections.
3. The Contractor shall invert white foreground to black as needed in line sections with light background.
4. In the case of a post liner survey, the Contractor shall fully televise both ends of the liner so that the fit of the liner to the host pipe can be evaluated.
5. The post liner and/or replaced lateral and/or point repaired lateral CCTV inspection shall be done within 2-weeks of installation.

B. B. Documentation

1. The same documentation shall be provided as indicated in paragraph 3.03 "Preconstruction Survey" of these specifications.

END OF SECTION

SECTION 02766
SANITARY SEWER OBSTRUCTION REMOVAL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This section includes clearing obstructions from the sewer main and lateral by remote device.
- B. Obstruction removal by remote device
 - 1. To remove protruding taps (service lines that protrude greater than 1-inch into the sewer)
 - 2. To remove other obstructions
 - 3. Removal of roots.
- C. The intent of the sewer line cleaning is to remove foreign materials from the lines and restore the sewer main and lateral so that CCTV clearly shows pipe and connection defects. It is recognized that there are some conditions such as broken pipe and major blockages that prevent obstruction removal from being accomplished or where additional damage would result if removal were attempted or continued. Should such conditions be encountered, the Contractor shall notify the City's Representative of their concern and the Representative will provide written confirmation that the obstruction will not be required to be removed from those respective sewer and lateral pipe segments. The representative's confirmation will be provided for each workday in which prohibitive conditions are encountered.
- D. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.
- E. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.
- F. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.
- G. Refer to Section 01001 General Work Requirements paragraph 1.01.A for minimum obstruction removal work qualifications.
- H. Refer to Section 01001 General Work Requirements paragraph 1.17.J for insurance coverage required for Chemical Root Treatment.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 LINE OBSTRUCTIONS REMOVAL:

- A. The Contractor shall remove any obstructions from within the sewer main and lateral that can be removed without excavation or compromising the integrity of the existing main or service lateral. Obstructions requiring excavation for removal shall be reported to and performed by the City.

3.02 OBSTRUCTION REMOVAL BY REMOTE DEVICE:

- A. This method of obstruction removal shall be performed during cleaning of the main and lateral. When CCTV of sanitary main or lateral identifies an obstruction, which constricts the flow carrying capacity of the sewer main, it shall be removed. The Contractor shall ask and receive the City Representative's written approval before proceeding with the obstruction removal.

3.03 CUT PROTRUDING TAPS:

- A. For break-in service connections that protrude more than one inch into the sewer, the CONTRACTOR shall remove the protruding portion of the tap in preparation to complete cleaning and CCTV of the sewer main and lateral. Cutters used shall be power-driven cutting devices (lateral cutters) designed to remove protruding taps. Cutters shall be capable of slicing laterally through cast iron, 3/4" rebar and anchors, clay tile, and concrete protruding into sewer lines. The CONTRACTOR shall cut protruding taps so that protrusions are no greater than 1/2 inch. While using a protruding tap cutter, slow RPM will cut more effectively than rapid RPM. The CONTRACTOR shall maintain a steady flow and RPM while cutting and shall flush out broken pieces in the line from the tap. If a protruding tap cannot be removed by the cutting device, then the City's Representative shall be notified to determine if a point repair will be necessary.
- B. In the event damage to the existing sewer line or service line occurs, a repair shall be done at the Contractor's expense and only a payment for the remote obstruction removal will be made. If the Contractor is unable to remove the protruding tap by this means, then a point repair may be performed by the City.

3.04 REMOVAL OF OTHER OBSTRUCTIONS:

- A. Removal of other obstructions includes items such as hanging gaskets, fixed debris, stabilized sand, hardened mineral deposits but excludes removal of tuberculation in cast or ductile iron pipes and grease.
- B. To remove other obstructions a remote device shall be utilized. The device(s) shall be pulled or driven from manhole to manhole up to a continuous length of 700-feet using a solid steel mandrel, porcupine, bucket, etc. to remove the obstruction. The device shall be adequately sized to remove the obstruction to the satisfaction of the City's Representative. Damage to the existing sewer main or service lateral must be repaired by the Contractor and only a payment for remote

obstruction removal will be made. The mechanical cleaning method may also be used to remove the obstruction when approved in writing by the City Representative. Damage to the existing sewer line, service line or tap must be repaired by the Contractor at his expense. The cleaning grease and normal solids from the pipe in preparation for CCTV of the sewer main or service lateral is not considered obstruction removal.

3.05 ROOT CUTTING:

- A. Notify the City when in the opinion of the contractor cutting is required.
- B. This section covers the preparatory cleaning and root removal from sanitary sewer mains and laterals prior to the internal inspection of the sewer lines by closed-circuit television. Root cutting shall be required where it has been determined that root growth is substantial and cutting would be required to facilitate a thorough and complete examination of the condition of the sewer through internal closed-circuit color television inspection. Caution needs to be observed with root removal. The Contractor needs to advise the City if it appears that cutting will compromise the integrity of the main or lateral. The City will review and instruct the Contractor on whether to proceed or not with cutting.
- C. The City reserves the right to deny payment for "Root Removal" if the City Representative or City work order manager were not informed of the need to cut roots.
- D. Root cutting tools shall be the industry standard concave saws, flat saws, water blasters or chain knockers and shall be carefully selected to ensure no damage is caused to the sewer main or any portion of the lateral including protruding laterals. Extreme caution should be taken when operating root cutters in the sewer and a video inspection shall always be on the root cutter to ensure damage is not caused from root cutting.
- E. All roots shall be captured and removed from the main and lateral line segments.
- F. Refer to Section 02761 paragraph 3.11 for chemical root treatment.

3.06 ACCEPTANCE OF THE OBSTRUCTION REMOVAL OPERATION:

- A. Acceptance of sewer line obstruction removal shall be made upon the successful completion of the CCTV inspection. If the CCTV inspection shows the removal to be unsatisfactory, the Contractor shall be required to complete the removal meeting the requirements of this section. Re-inspect of the sewer line will be required until the obstruction removal is shown to be satisfactory.

3.07 METHOD OF MEASUREMENT AND PAYMENT:

- A. Protruding tap or other obstructions removal by remote device will be paid on a unit price basis for each tap or obstruction removed within a manhole segment.

- B. A mobilization charge is to be included in the unit price for each manhole segment where obstructions are removed and shall include all obstructions removed within that manhole segment.
- C. Root cutting will be paid on a unit price per linear foot of removal.
 - 1. The total quantity of removal shall be the measured straight-line distance in Linear Feet of roots approved for removal. Measurement will begin at the first point in the line where roots have been approved for removal and end where designated by the City Representative and agreed to by the Contractor. Should root removal extend in the line segment to the upstream manhole the measurement will extend to the centerline of this manhole.
 - 2. The total linear feet of removal will be agreed upon prior to commencing removal by both the City Representative and Contractor.
- D. The cost of the following items of work are included in the unit prices for tap, other obstruction and root removal by remote device:
 - 1. Cleaning of Sewer mains or laterals of removal debris.
 - 2. Post television inspection of the removal.
 - 3. Hauling away and lawful disposal of excess excavated material and debris.
 - 4. All other necessary work to complete.
- E. Payment will not be made for obstruction removal if the existing sewer line, service line or tap is damaged, and a point repair is required.

END OF SECTION

SECTION 02771 CURE-IN-PLACE PIPE FOR SANITARY SEWER RENEWAL

PART 1 - GENERAL

1.01 REQUIREMENTS

- A. The Work within this Section consists of the installation and testing cured-in-place pipe (CIPP). The CIPP shall provide a structurally sound, joint-less and water-tight new pipe within a pipe. The Contractor is responsible for proper, accurate and complete installation of the CIPP using the system selected by the Contractor.
- B. The finished liner shall extend over the installation length in a continuous, tight fitting, watertight pipe-within-a-pipe and shall be fabricated from materials which, when installed, will be chemically resistant to withstand internal exposure to domestic sewage.
- C. Neither the CIPP system, nor its installation, shall cause adverse effects to any of the City's facilities or processes. The use of the product shall not result in the formation or production of any detrimental compounds or by-products at the treatment facilities. The Contractor shall test and monitor the levels of by-products produced as a result of the installation operations. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses, and property owners or tenants.
- D. All contractors and employees' vehicles on the project site for the City shall clearly and boldly display their full name, address, and phone number.
- E. Maintenance of Traffic (MOT)
Refer to General Requirements Section 01570, Maintenance of Traffic requirements.


1.02 INSTALLER EXPERIENCE AND QUALIFICATIONS

- A. Refer to Section 01001 General Work Requirements paragraph 1.02.B for minimum lining work experience. 06-08-2020 Conformed



1.03 PERFORMANCE WORK STATEMENT

- A. The Contractor shall submit, before any lining WORK is performed, to the City a Performance Work Statement (PWS) which clearly defines the CIPP product delivery in conformance with the requirements of these contract documents. The PWS shall contain at a minimum the following:
 - 1. Contractor's certificate of compliance that clearly indicates that the CIPP will conform to the project requirements as outlined in Specification Section 01010 Summary of Work and as delineated in these specifications.
 - 2. A detailed installation plan describing:

- a. All preparation work (cleaning operations, pre-CCTV inspections, by-pass pumping, and traffic control)
 - b. Liner wet-out procedure. 06-08-2020 Conformed 
 - c. Installation procedure, medium and method of curing. 06-08-2020 Conformed
 - d. Service reconnection
 - e. Quality control and testing to be performed
 - f. Post-CCTV inspection
 - g. Warrantees
 - h. Description of the proposed CIPP lining technology.
3. A detailed plan for identifying all active service connections during mainline installation.
 4. The qualifications of the Contractor.

Name, business address and telephone number

Personnel names, experience, and certifications for Field Superintendent, CIPP lead Installer, Lateral Cutter, Boiler Technician, and Lead CCTV NASSCO PACP Certified Inspector to be directly involved with this project. The Contractor shall sign and date the information provided and “certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this project”. Substitutions of personnel and/or methods will not be allowed without written authorization of the City. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the City/Professional.
 5. Proposed manufacturer’s technology data shall be submitted for all CIPP products and all associated technologies to be furnished.
 6. All tools and equipment required for a complete installation of the CIPP.

Clearly describe all equipment including proposed back-up equipment to be furnished for this project.

Identify redundant tools and equipment to be kept on the job site in the event of equipment breakdown.

The Contractor shall outline the mitigation procedure to be implemented in the event of key equipment failure during the installation process for the CIPP.
 7. A detailed description of the Contractor’s proposed procedures for the removal of any existing blockages in the pipeline that may be encountered during the cleaning process.
 8. Detailed public notification plan for stage notification to residences affected by the CIPP installation.
 9. An odor control plan that will ensure that project specific odors will be minimized at the project site and surrounding area.
 10. Outline specific repair or replacement procedures for potential defects that may occur in the installed CIPP. Repair or replacement procedures shall be as recommended by the CIPP system manufacturer and shall be submitted prior to any Work.
 - a. Repairable defects that may occur in the installed CIPP shall be specifically defined by the Contractor based on the manufacturer’s recommendations, including a detailed step-by-step repair procedure, resulting in a finished product meeting the requirements of the specifications.

- b. Un-repairable defects that may occur to the CIPP shall be clearly defined by the Contractor based on the manufacturer's recommendations, including a recommended procedure for the removal and replacement of the CIPP.

1.04 REFERENCES

A. Codes, Specifications, and Standards

1. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the references thereto. Latest revisions shall apply, unless otherwise shown or specified.
2. All American Society for Testing and Materials (ASTM) Standards noted below shall be to the latest revised version.
 - D543 – Standard and Practice for Evaluating the Resistance of Plastics to Chemical Reagents
 - D638 – Standard Test Method for Tensile Properties of Plastics
 - D790 – Standard Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials
 - D792 – Standard Test Methods for Density and Specific Gravity of Plastics by Displacement
 - D2122 – Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
 - D2837 – Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
 - D2990 – Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
 - D3567 – Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
 - D3681 – Standard Test Method for Chemical Resistance of “Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe and Fittings
 - D5813 – Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe
 - F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin-impregnated Tube
 - F1743 – Standard Practice for Rehabilitation of existing pipelines and conduits by pulled-in-place installation of cured-in-place thermo setting resin pipe
 - F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - F2561 - Standard Practice for Rehabilitation of a Sewer Service lateral and Its Connection to the Main Using a One-Piece Main and Lateral Cured-in-Place Liner
 - F2599 – Standard Practice for the Sectional Repair of Damaged Pipe by Means of An Inverted Cured -In-Place Liner

1.05 PRE-TREATMENT OF REGULATED CHEMICALS TO DISCHARGE INTO SEWER

- A. CIPP liner systems using resins containing styrene or other regulated chemicals that will be discharged into the wastewater system shall be required to reduce the concentration of Styrene in the cure water prior to discharge to the sanitary sewer. The discharge limits are

as follows:

	Discharge Limits	
	Maximum Styrene Concentration Limit for Discharge (PPM)	Maximum Total Pounds per Day of Styrene to be Discharged (Pounds/Day)
< 500,000	7	29
< 250,000	14	29
< 100,000	35	29

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1. A single day's or line segment water discharge in excess of 500,000 gallons per day shall require approval by the City's Environmental Compliance Section for separate concentration limit evaluation and approval."
2. Discharge concentrations will be reduced based on the collection system distance from the City's Wastewater Treatment plant.

B. After curing, the Contractor shall obtain a post-treatment cure water sample from the first segment lined in each Work Order and submit for laboratory analysis. 06-08-2020 Conformed

1. The following laboratory analysis is required:
 - a. One (1) sample to be collected from the treated water line segment and analyzed for "Styrene" using EPA Method 8260.
 - b. One (1) "Trip Blank" sample, analyzed for "Styrene" using EPA Method 8260.
2. The Contractor shall submit the analytical report to the City for approval.
3. The Contractor shall be responsible for all costs related to laboratory analytical testing of the water samples collected.
4. Once the sample results demonstrate that the discharge limits have been met the Contractor shall follow similar styrene reduction procedures for subsequent lining segments, but sampling will not be required. 06-08-2020 Conformed
5. The City reserves the right to obtain samples at any site on any line segment to ensure compliance with the discharge limits."

1.06 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

1.07 PROPERTY DAMAGE

- A. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

1.08 SHOP DRAWINGS AND SUBMITTALS

- A. Submittals shall be submitted to the City for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals." Submittals shall include the following:

1. Performance Work Statement shall be provided with a table of contents and tabbed sections.

2. Product:

a. A list of projects from the Manufacturer that total a minimum of 500,000 linear feet of liner installed in the United States. An Excel spread sheet shall be included listing as a minimum the name of projects, linear footage of main, completion date, contract amount, name of owner, address, contact person, and phone number.

b. Fabric tube – manufacturer and description of product components

c. Flexible membrane (coating) material and recommended repair (patching) procedure if applicable

d. Raw resin data – manufacturer and description of product components

e. Manufacturer's shipping, storage and handling recommendations for all components of the CIPP system

f. All MSDS sheets for all materials to be furnished.

g. Pre-Liner.

h. Hydrophilic end seals for manhole penetrations.

i. Tube wet-out and cure method including:

(1) A complete description of the proposed wet-out procedure for the proposed technology

(2) The manufacturer's recommended cure method for each diameter and thickness of CIPP liner to be installed including the curing medium and the method of application

(3) Method of cure and means to minimize quantity of styrene discharge back into the wastewater collection system.

(4) Method to minimize the safety risk to workers and the from exposure to hazardous chemicals associated with CIPP curing process.

3. Quality Control Plan

a. Defined responsibilities of the Contractor's personnel for assuring that all quality requirements are met. These will be assigned by the Contractor to specific personnel.

b. Proposed procedures for quality control, product sampling and testing shall be defined and submitted as part of the Plan.

c. Proposed methods for product performance controls, including the method of and frequency of product sampling and testing both in raw material form and cured product form.

d. Inspection forms and guidelines for quality control inspections shall be prepared in accordance with the standards specified within this specification.

e. The manufacturer shall furnish a check list containing key elements of the CIPP installation criteria that is important for the City to ensure that quality control and testing requirements are performed in accordance with these specifications.

4. Engineering design calculations shall be submitted in a timely fashion prior to construction, in accordance with the Appendix of ASTM F-1216, for each length of liner to be installed including the thickness of each proposed CIPP. It will not be acceptable for the Contractor to submit a design for the most severe line condition and apply that design to all the line sections. All calculations shall include data that conforms to the requirements of these specifications.

a. These calculations shall be performed and certified by a Professional Engineer registered in the State of Florida.

b. The manufacturer shall certify as to the compliance of its materials to the values used in the calculations.

5. The liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at 5°F (degrees Fahrenheit) increments ranging from 70°F to 100°F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner

6. Certified copies of test reports of factory tests required by the applicable standards and this Section.

7. Manufacturer's installation instructions and procedures.

8. CIPP Installation Record (Shot Record) to include shot number and corresponding manhole to manhole pipe reaches for each scheduled installation, design thickness, actual thickness delivered to the site, pipe diameter, reach length, total length of shot, and number of laterals.

9. Wastewater pre-treatment plan including data, measurements, assumptions, calculations and procedures for the pre-treatment of CIPP process wastewater containing regulated chemicals.

10. Manufacturer's detailed procedures for repairing liners that have been installed incorrectly or that have failed during installation.

11. Contractor's procedures and materials for service renewal including time and duration of sewer service unavailability and a complete description of the methods he intends to use to reconnect the existing laterals.

12. Sampling procedures and locations for obtaining representative samples of the finished liner.

13. Sampling tests for compliance by an independent laboratory shall be made according to the applicable ASTM specification and the manufacturer's quality control program.

B. A final certificate of compliance with this specification shall be provided by the manufacturer for all lining material furnished.

1.09 WARRANTY


- A. Refer to Section 01001 General Work Requirements paragraph 1.03.A for all warranties covering CIPP work.


1.10 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall be responsible for the delivery, storage, and handling of products. No products shall be shipped to the job site without the approval of the City.
- B. Keep products safe from damage. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.
- C. The wet-out facility shall write the Shot number, total wet-out length, thickness, pipe width, and resin type on each bag delivered to the project.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The materials used shall be designed, manufactured, and intended for sanitary sewer pipe relining and the specific application in which they are used. The materials shall have a proven history of performance in sewer relining and rehabilitation.
- B. Pipe lining products pre-approved by the City include: Insituform Technologies (CIPP Liner), National Liner (CIPP Liner), LMK Enterprises (Performance Liner), Stevens Technologies (CIPP Liner 2 part 100% epoxy), Inner Cure Technologies (Reichold/Dion CIPP Liner), Lanzo Lining Services (Lanzo CIPP Lining System), and Premier Pipe (Premier Pipe CIPP Lining System), Layne Inliner (CIPP Liner), Service Connection Seal + Lateral Brim & Full Wrap Lateral Liner BLD Services (Main/Lateral Connection Liner) and Miller Pipeline (CIPP Liner). All products must meet the specification herein and will require approval prior to installation. 06-08-2020 Conformed 
- C. Pre-Liner:
 - 1. Griffolyn as manufactured by Reef Industries, Inc. or pre-approved equal.
- D. Hydrophilic End Seals by LMK Enterprises or pre-approved equal.
- E. All materials, shipped to the project site, shall be accompanied by test reports certifying that the material conforms to the ASTM listed herein. Materials shall be shipped, stored, and handled in a manner consistent with written recommendations of the CIPP system manufacturer to avoid damage. Damage includes, but is not limited to, gouging, abrasion, flattening, cutting, puncturing, or ultra-violet (UV) degradation. On site storage locations, shall be approved by the City. All damaged materials shall be promptly removed from the project site at the Contractor's expense and disposed of in accordance with all current applicable agency regulations.

- F. The finished pipe liner in place shall be fabricated from materials which when complete are chemically resistant to and will withstand internal exposure to domestic sewage having a pH range of 5 to 11 and temperatures up to 150°F.
- G. Take all necessary field measurements of the existing pipe (including diameter, ovality and length) prior to manufacturing liners.
- H. The minimum length shall be that deemed necessary by the Contractor to effectively span the distance from the inlet to the outlet of the respective manholes unless otherwise specified. The Contractor shall verify the lengths in the field before manufacturing.
- I. Segment liner design will be based on a safety factor of 2, soil modulus of 1000 psi, soil density of 120 pcf, H2O live load, in place depth of cover, groundwater 3 ft. less than the depth of cover, and ovality of 2%.
- J. Point repair liner segments shall not begin or end at a pipe joint.
- K. Point repair section liners shall have a minimum length of 3-ft. Section liners shall extend a minimum of 1-ft. beyond the pipe defects at each end of the repaired section. Length of each required repair shall be verified in the field prior to installation. 06-08-2020 Conformed 
- L. All cured-in-place point repairs shall be one piece. Separately fabricated or installed point repairs shall not have butted ends or overlaps.

2.02 STRUCTURAL REQUIREMENTS

- A. Each CIPP shall be designed to withstand internal and/or external loads as dictated by the site and pipe conditions. The CIPP design shall assume no bonding to the original pipe wall.
- B. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. The long-term modulus shall not exceed 50 percent of the short-term value for the resin system and shall be verifiable through testing. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.
- C. The Contractor shall submit, prior to installation of the lining materials, certification of the compliance with these specifications and/or the requirements of the CIPP system. Certified material test results shall be included that confirm that all materials conform to these specifications. Materials not complying with these requirements will be rejected.

- D. The design thickness of the CIPP shall be arrived at using standard engineering methodology as found in ASTM F1216 and the physical properties. In no case shall the finished thickness of the cured liner be less than 4.5 millimeters nominal. The required cured structural CIPP wall thickness shall be based, as a minimum, on the physical properties described in TABLE 02771 - 1 Minimum Physical Properties and per the design of the Professional Engineer and in accordance with the design equations in ASTM F 1216 Appendix X1 and the following design parameters:

Design Considerations	Criteria
Tube Design	ASTM F 1216 Appendix X1
Hydrostatic Buckling	ASTM F 2561 Section 6.1 and 6.1.1
Design Safety Factor	2.0
Retention Factor for Long Term Flexural Modulus to be used in Design	50 % of the short-term value of the resin system
Ovality	2 %
Groundwater Depth*	100% depth from pipe invert to surface
Soil Depth*	As indicated on the plans
Lining enhancement factor (K)	7
Soil Modulus**	1,000 psi
Soil Density**	120 pcf
Live Load**	One (1) H20 passing truck
Design Condition	Fully deteriorated
Minimum Long-Term Life	50 years

*Denotes multiple line segments may require a table of values

**Denotes information required for fully deteriorated design conditions

TABLE 02771-1
Minimum Physical Properties

Property	Standard	Cured Composite per ASTM F1216 (PSI)
Flexural Strength (short term)	ASTM D790	4,500
Flexural Modulus of Elasticity (short term)	ASTM D790	250,000

- E. When multiple layers are present, the layers of the finished CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or such that the knife blade moves freely between the layers. If separation of the layers occurs during testing of the field samples, new samples will be cut from the work. The composite of the materials will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods. Any reoccurrence may be cause for rejection of the work.

TABLE 3-1 Typical Liner Thickness			
SEWER DIAMETER	PIPE INVERT DEPTH UP TO 10'	PIPE INVERT DEPTH UP TO 10-15'	PIPE INVERT DEPTH 15' AND OVER
6"	4.5 mm	4.5 mm	4.5 mm
8"	6.0 mm	6.0 mm	6.0 mm
10"	6.0 mm	6.0 mm	7.5 mm
12"	6.0mm	7.5 mm	9.0 mm
15"	7.5 mm	9.0 mm	10.5 mm
18"	9.0 mm	12.0 mm	13.5 mm
21 "	10.5 mm	13.5 mm	15.0 mm
25"	12.0 mm	15.0 mm	16.5 mm
30"	15.0 mm	18.0 mm	21.0 mm
36"	16.5 mm	21.0 mm	24.0 mm
42"	22.5 mm	24.5 mm	28.5 mm
48"	22.5 mm	28.5 mm	33.0 mm

2.03 CURED-IN-PLACE LINER


A. Fabric

1. The Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes. The Contractor shall verify the lengths in the field prior to ordering and prior to impregnation of the tube with resin, to ensure that the tube will have sufficient length to extend the entire length of the run. The Contractor shall also measure the inside diameter of the existing pipelines in the field prior to ordering liner so that the liner can be installed in a tight-fitted condition.
2. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F-1216, ASTM F1743, or ASTM D5813. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
3. The wet-out tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design CIPP wall thickness.

- 1) All pipes to be considered fully deteriorated.
- 2) All pipes shall be subjected to soil load of 120 lbs./c.ft., with applicable live load, and water table two (2) feet below the top of the ground.
- 3) All pipes shall have a minimum of 2% ovality in the circumference
- 4) The above liner thicknesses shall be maintained as a minimum.

4. The flexible tube shall be fabricated to a size that when installed will neatly fit (minimum 99.75%) the internal circumference of the existing sanitary sewer lines (including services). Allowance shall be made for circumferential stretching during insertion so that the final cured product is snug against the wall of the host pipe.
5. The outside layer of the tube shall be coated with an impermeable, flexible membrane that will contain the resin and allow the resin impregnation (wet out) procedure to be monitored.
6. The tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
7. The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
8. Seams in the tube shall be stronger than the non-seamed felt material.
9. The tube shall be marked for a distance at regular intervals along its entire length, not to exceed five feet. Such markings shall include the Manufacturers name or identifying symbol.
10. Unless otherwise specified, the Contractor will use a polyester filter felt tube and a resin and catalyst system compatible with the inversion process and having the minimum physical properties for the cured pipe identified in Table 02771 - 1 Minimum Physical Properties.

B. Resin

1. The resin system shall be a corrosion resistant polyester or vinyl ester resin and catalyst system or epoxy and hardener system that when properly cured within the tube composite, meets the minimum requirements of ASTM F1216 as tested in accordance with ASTM D543, ASTM F1743 or F2019, the physical properties given herein these specifications Section 02771 and those, which are to be utilized in the design of the CIPP for this project. 06-08-2020 Conformed 
2. The resin used shall not contain non-strength enhancing fillers.
3. The Contractor shall submit the resin characteristics, including filler identification, to the City for approval prior to lining activities.
4. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of the specification.

C. Point Repair CIPP Sectional Liners

1. Starting point, anywhere within main run.
2. Length as needed to provide a 1 ft. margin from the defect.
3. Time for cure, 2 hours.
4. End thickness to taper down to 5mm for main line sleeves.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to any lining of a pipe so designated.

1. It shall be the responsibility of the Contractor to remove all internal debris and clean the existing sewer line and/or lateral in accordance with the recommendations of the liner manufacturer prior to installation of the liner and in accordance with Section 02761 "Cleaning Sanitary Sewer Systems." Both mainline and lateral line shall be cleaned.
 - a. Preparation of the interior surface shall be accomplished by a thorough high-pressure water-jet cleaning. The pipe shall be left free of all loose sand, rock, or other deleterious materials. Any roots in the pipe shall be either removed or cut off flush with the interior.
 - b. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning or where additional damage would result if cleaning is attempted or continued, the Contractor shall notify the City immediately. The City will determine what course of action will be taken to complete the project.
 - c. Precautions shall be taken by the Contractor to ensure that no damage or flooding of public or private property is caused by the cleaning operation.
 - d. The City shall inspect the prepared pipe for cleanliness and smoothness before the Contractor is authorized to proceed with pipe lining operations.
 - e. Mains or laterals that had roots prior to cleaning shall receive chemical root treatment.
2. Certified PACP personnel trained in locating breaks, obstacles and service connections by closed circuit television shall perform inspection of existing sewer lines. The interior of the line shall be carefully inspected in accordance with Section 02762 "Televising Sanitary Sewer Systems" to determine the location of laterals in any condition that may prevent proper installation of the liner pipe into the lines. Such conditions shall be noted so they can be corrected. A digital data video and a suitable log shall be prepared by the Contractor during the Work and provided to the City a minimum of two weeks prior to liner installation.
3. The Contractor shall provide for the flow of sewage around the section or sections of pipe designated for lining as specified in Section 01516 "Collection System Bypass."
 - a. Flow control shall be exercised as required to ensure that no flowing sewage comes into contact with sections of the sewer under repair.
 - b. A sewer line plug shall be inserted into the sewer upstream from the section to be repaired. The plug shall be so designed that all or any portion of the sewage flows can be released. During the review, testing and installation portion of the operation, flows shall be shut off in order to properly install the cured-in-place pipe lining. The upstream manholes shall be constantly monitored for degree of surcharging. After the installation is complete, flows shall be restored to normal level.
 - c. Wherever lines are blocked off and the possibility of backing up the sewage and causing harm to public and private property is foreseen, it shall be the Contractor's responsibility to bypass flow from manhole to manhole.
 - d. Bypassing shall be accomplished using sewer plugs with pump connections, by pumping down surcharged manholes, or by other methods acceptable to the City. All bypassed flow must be discharged to a sanitary sewer. Bypassed flow shall not be allowed to enter any storm line, drainage ditch or street gutter.

- e. During a bypass operation, the pump shall be manned continuously; the Contractor shall maintain the pump and bypass equipment; and shall be responsible for any damages to public or private property due to the malfunction of same.
4. The Contractor shall clear the line of obstructions such as solids, dropped joints, protruding service connections or collapsed pipe that will prevent the insertion of the liner pipe. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then the City shall be notified immediately.
5. If, in the opinion of the CIPP liner manufacturer, the rate of infiltration in the sewer segment is high enough to risk washout of the resin then the Contractor shall perform measures, such as grouting or installation of a pre-liner, as required to minimize infiltration prior to installation. If during the pre-CCTV inspection any infiltration conditions are observed, the Contractor shall submit, in writing for approval by the Owner, the methods and materials for mitigating any adverse impacts from infiltration.
6. Do not install liner if ground water temperatures and/or ambient temperatures are excessive for the product installation procedures.
7. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.
8. Contractor shall coordinate pump stations, force main and sanitary sewer operation, bypass and shutdown control with the City
9. Traffic Control: The Contractor shall provide all traffic control measures required for the safety of the public, workers and equipment during the Work and in accordance with FDOT and the City.
10. The Contractor shall provide critical backup equipment to ensure that the lining operation progresses without interruption. Required backup equipment shall include at a minimum 1 additional lateral cutter system and 1 additional CCTV camera system.

3.02 INSTALLATION OF LINER

- A. The CIPP liner shall be installed and cured in the host pipe per the manufacturer's specifications as described and submitted in the Performance Work Statement. CIPP installation shall be in accordance with the applicable ASTM Standards with the following modification:
 1. Prior to installation and as recommended by the manufacturer remote temperature gauges or sensors shall be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner and/or host pipe interface temperature shall be monitored and logged during curing of the liner.
 2. Verify liner end seals are in-place in the wetted liner.
 3. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat source. Another such gauge shall be placed between the impregnated reconstruction tube and the pipe invert at the remote manhole to determine the temperatures during cure. The resin manufacturer shall recommend temperature in the line during the cure period.

4. The wet-out tube shall be positioned in the pipeline using the method specified by the manufacturer. Care should be exercised not to damage the tube as a result of installation. The tube shall be inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point. Sufficient excess resin will be provided to ensure excretion into cracked pipe and/or joints of the host pipe after curing.
5. After inversion is completed, the Contractor shall supply suitable heat source and recirculation equipment. The equipment shall be capable of delivering the heat source throughout the section uniformly to raise the temperature above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed. Temperatures shall be monitored and recorded throughout the installation process to ensure that each phase of the process is achieved at the manufacturer's recommended temperature levels. Copies of these records shall be given to the City at the completion of each installation.
6. Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source input and output temperatures shall be monitored and logged during the cure cycles if applicable. The manufacturer's recommended cure method and schedule shall be used for each line segment installed in consideration of the existing conditions and in accordance with applicable ASTM Standards. 06-08-2020 Conformed
7. For heat cured liners, if any temperature sensor or multiple sensors do not reach the temperature as specified by the manufacturer to achieve proper curing or cooling, the installer can make necessary adjustments to comply with the manufacturer's recommendations. The system computer should have an output report that specifically identifies each installed sensor station in the length of pipe, indicates the maximum temperature achieved and the sustained temperature time. Each sensor should record both the maximum temperature and the minimum cool down temperature and comply with manufacturer's recommendations.
8. For UV cured liners, all light train sensor readings, recorded by the tamper proof computer, shall provide output documenting the cure along the entire length of the installed liner. The cure procedure shall be in accordance with the manufacturer's recommendation as included in the performance work statement.
9. Temperatures and curing data shall be monitored and recorded by the Contractor throughout the installation process to ensure that each phase of the process is achieved as approved in accordance with the CIPP system manufacturer's recommendations.
10. The Contractor shall immediately notify the City of any delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the City's discretion. The cost of such test shall be borne by the Contractor and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the Work at the City's discretion.
11. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the cured-in-place inversion process, during which time the recirculation of the heat source

and cycling of the heat exchanger to maintain the temperature continues. Contractor shall retain a resin-impregnated sample (wick) to provide verification of the curing process taking place in the host pipe.

12. The Contractor shall cool the hardened pipe to a temperature below 100°F before relieving the static head in the inversion standpipe. Cool-down may be accomplished by the introduction of cool water into the inversion standpipe to replace water being drained and disposed per the approved pre-treatment plan. Care shall be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed pipe.

13. Seal the area where the line enters or leaves each manhole. Finish the inside of the manhole with a quick set cement grout to raise the invert to the grade of the liner pipe. Also use this grout to dress up around the end of the liner. This space may be sealed with a mechanical seal, chemical seal, or combination of both. The Contractor shall seal the liner at all manhole reconnections with an approved product, compatible with the liner, to completely seal any annular space present.

14. If the pipe liner fails to make a tight seal due to broken or misaligned pipe at the manhole wall or other reason, the Contractor shall apply a seal at that point.

15. The temperature of water discharged to the sewer system from processing liners shall not exceed 100°F maximum or the level allowed by State or Local standards. When draining water, care shall be exercised not to create a vacuum in the line.

16. After the liner has been installed, all active, existing services shall be temporarily reinstated. This shall be done without excavation in pavement areas, and in the case of non-man-entry pipes, from the interior of the pipeline by means of a 360° (degree) television camera and a cutting device that re-establishes the service connection. When a remote cutting device is used and a cleanout is available, then a mini camera down the service may also be used to assist the operator in cutting or trimming. All coupons shall be recovered at the downstream manhole and removed.

17. The cost for maintaining sanitary sewer service for the property owners shall be included in the prices bid and no additional compensation will be allowed.

3.03 POST INSTALLATION

A. Service Lateral Renewal

1. The number of service connections on some sewer segments may exceed the number of buildings served. It is the Contractor's responsibility to determine through dye testing, or other acceptable methods, the services that are live and require reinstatement prior to commencing lining of the sewer main.

2. Inactive services to vacant parcels shall be renewed, unless otherwise directed by the City.

3. The exact location and number of service connections or side sewers shall be verified during the initial television inspection. It shall be the Contractor's responsibility to accurately field locate all existing service connections or side sewers and establish means for access for flow control. The Contractor shall reconnect all service connections or side sewers to the liner pipe as indicated in accordance with the Contract Documents.

4. The Contractor shall be responsible for restoring/correcting, without any delay, all

missed or faulty reconnections, as well as any damage caused to property owners for not reconnecting the services soon enough or for not giving notice to the property owners.

5. Any lateral not initially reinstated by the Contractor that proves to be active shall be reinstated by the Contractor at no additional cost to the City and the Contractor shall be responsible for any resulting property damage of floods.

6. All existing service connections shall be reconnected by a remote-controlled cutting device directed internally by a television camera or by internal manual cutting. Cuts shall be made by experienced operators so that no blind attempts or holes are made in the liner pipe. Locations shall be verified carefully to match earlier tapes for accurate lateral location, especially where dimples are not well defined. The City reserves the right to require service connection by excavation at the Contractor's expense at any location if the quality of workmanship of the cut is not satisfactory.

7. A 2-pass process of utilizing a cutter to open the lateral followed by wire brush (or similar) attachment to complete the cutting flush with the lateral walls should be utilized or approved alternate. It shall be properly aligned, invert to invert, to the existing connection with no obstructions to the flow. Resin slugs shall be removed as necessary from reinstated service connections. Any mis-cuts shall be repaired at no cost to the City and shall be performed utilizing an additional thinner liner to prevent water from entering behind the liner to the full satisfaction of the City. All coupons cut from the liner for reopening of lateral connections shall be retrieved from the sewer, accounted for by the Contractor, and turned over to the City.

8. Service connections shall be reinstated to at least 95% of the original area as it enters the host pipe.

9. All service connections and side sewers to be reconnected to the main sewer, shall be cleaned up to a length of 1-foot from the inside face of the existing wall of the main pipe. All deposits within the first foot of the service connection or side sewer in the service connections shall be removed and laterals reinstated.

10. Contractor shall provide a sound, smooth transition from laterals/side sewers to the main sewer. Contractor shall submit for approval a detailed repair plan for the permanent repair of any gaps between the installed liner and the face of the lateral/side sewer connections.

11. For PVC laterals or laterals that have been previously lined with cured-in-place pipe the Contractor shall take care during the reinstatement to avoid damage to the lateral pipe.

B. Each pipelined shall be post-CCTV inspected in accordance with Section 02762 "Televising Sanitary Sewer Systems" as soon as practical after processing to assure complete curing.

1. The Contractor shall not reactivate any section of lined sewer pipe until authorized to do so by the City. Segments not fully conforming to these Specifications must be immediately brought to the City's attention with a proposed method of correction.

2. Immediately prior to conducting the post-lining CCTV, the Contractor shall thoroughly clean the newly installed liner removing all debris and build-up that may have accumulated, at no additional cost to the City.

3. The post-CCTV inspection documentation shall be submitted within 15 working

days of the liner installation. The City may at its discretion suspend any further installation of CIPP until the post-installation documentation is submitted.

- a. As a result of this suspension, no additional working days will be added to the contract, nor will any adjustment be made for increase in cost. 06-08-2020 Confirmed



C. Defects

1. The liner shall be continuous and free of all visual and material defects except those resulting from pre-lined conditions (such conditions shall be brought to the attention of the City prior to lining).
2. There shall be no damage, deflection, holes, delaminating, uncured resin or other visual defects in the liner.
3. The liner surface shall be smooth and free of waviness throughout the pipe.
4. No visible leakage through the liner or at manhole or service lateral connections will be allowed.
5. Any defects located during the inspection shall be corrected by the Contractor to conform to the requirements of the specifications and to the satisfaction of the City.
6. Defects in the installed CIPP shall be identified and defined as specified in Section 02762 Televising Sanitary Sewer Systems.
7. Repairable defects that may occur in the installed CIPP shall be specifically defined by the Contractor based on manufacturer's recommendations, including a detailed step-by-step repair procedure, resulting in a finished product meeting the requirements of these contract specifications.
8. Un-repairable defects that may occur to the CIPP shall be clearly defined by the Contractor based on the manufacturer's recommendations, including a recommended procedure for the removal and replacement of the CIPP.

D. Manhole Connections



1. Where liners of any type are installed in 2 or more continuous manhole segments, the liner invert through the intermediate manholes shall be left intact. Final finishing of the installation in those intermediate manholes shall require removal of the top of the exposed liner and neat trimming of the liner edge where it touches the lip of the manhole bench.
2. Reinstall openings for all manhole drop assemblies after relining mainline sewer
 - a. Outside drop assemblies shall be lined with a cured-in-place liner compatible with the mainline liner, for the full length of the drop assembly and bend.
 - b. Inside drop assemblies are not required to be relined.
3. A seal consisting of a resin mixture or hydrophilic seal compatible with the installed CIPP shall be applied at manhole/wall interface in accordance with the CIPP system manufacturer's recommendations.

- E. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the City.

3.04 TESTING

- A. The physical properties of the installed CIPP shall be verified through field sampling and

laboratory testing. All testing shall be furnished by the Contractor. All materials testing shall be performed at the Contractor's expense, by an independent third-party laboratory selected by the City as recommended by the CIPP manufacturer. All tests shall be in accordance with applicable ASTM test methods to confirm compliance with the requirements in these documents.

- B. The Contractor shall pay for all testing included in this section
- C. The Contractor shall provide samples for testing from the actual installed CIPP liner. The Contractor shall determine sampling location and procedures to ensure representative samples are obtained from the finished liner, subject to the approval by the City. The contractor shall provide removable sizing sleeves, when possible, to collect liner samples, which accurately replicate the host pipe diameter. 06-08-2020 Conformed 
1. A minimum of 1 sample shall be taken of the first segment installed or as directed by the City.
 2. A minimum of 2 samples shall be taken for each 2,500 lineal feet of liner material installed or for each manufacturing lot, if less, or as directed by the City.
 3. A minimum of 6 samples per project shall be taken for each type of liner furnished or as directed by the City.
 4. A sample shall be cut from a section of cured liner that has been inverted or pulled through a like diameter pipe which has been held in place by a suitable heat sink such as sandbags.
 5. All curing, cutting, and identification of samples shall be witnessed by the City.
- D. Tests of the samples shall be conducted in accordance with ASTM standards
1. Short term flexural properties: The initial tangent flexural modulus of elasticity and flexural strength shall be measured in accordance with test methods in ASTM D790.
 2. Fiber reinforced flexural properties: specimens should be sampled in accordance with ASTM F1743, section 8.1.2 and flexural properties shall be determined in accordance with ASTM F1743, section 8.1.3 along the longitudinal and circumferential axis of the install CIPP.
 3. Fiber reinforced tensile properties: Where the CIPP is reinforced with oriented continuous or discontinuous fibers to enhance the physical properties of the CIPP, specimens shall be sampled in accordance with ASTM F1743, section 8.1.2 and tensile properties shall be determined in accordance with ASTM D3039 and tested along the longitudinal axis and circumferential axis of the installed CIPP.
 - a. One random tensile test will be taken on each Work Order. The segment from which this test sample is taken will be selected by the City. 06-08-2020 Conformed 

4. CIPP wall thickness shall be determined in a manner consistent with ASTM D5813, section 8.1.2. Thickness measurements shall be made in accordance with the practice in ASTM D3567 for ASTM D5813, section 8.1. Deduct from the measured values the thickness of any plastic coating or CIPP layer not included in the structural design of the CIPP. The average thickness shall be calculated using all measured values and shall meet or exceed the minimum design thickness. The minimum wall thickness at any point shall not be less than 87.5% of the approved specified thickness.
- E. The installed CIPP thickness shall be measured for each liner shipment to the job site. If the CIPP thickness does not meet that specified in the contract and submitted as the approved design by the Contractor, then the liner shall be repaired or removed. The samples shall be made by core drilling 2-inch diameter test plugs at random locations selected by the City. As an alternative the Contractor may use industry proven, non-destructive methods for confirming the thickness of the installed CIPP if it can be shown the calibrated thickness is the same as core test plugs.

3.05 ACCEPTANCE

A. Liner

1. It is the intent of these specifications that the completed liner with all appurtenances shall be essentially equivalent in final quality and appearance to new sewer installation.
 2. The finished liner shall be continuous over the entire segment between manholes and homogenous throughout.
 3. The finished liner shall be fully rounded and as free as commercially practicable from visible defects, including but not limited to damage, deflection, holes, delamination, ridges, cracks, uncured resin, foreign inclusions or other objectionable defects.
 4. Where a defect in the liner requires removal of a section of the liner in the City's opinion, the Contractor shall make all repairs as required by the City and shall install a segmental liner, compatible with the liner, to accomplish a continuous finished liner.
 5. The pipe shall be neatly and smoothly cut off at each manhole. The manhole trough shall be raised to the invert of the liner to preclude snagging and shoaling of debris.
- B. Defects: Any defect which will or could affect the structural integrity, strength of the lining, flow impairment, or leaks shall be repaired as outlined below or in accordance with the approved repair or replacement procedures as recommended by the CIPP system manufacturer. The repair or replacement of the defects will be at the Contractor's expense.
1. Leaks
 - a. There shall be no visible infiltration through the liner, around the liner at manhole connections, at lined service connections or in lined services. Contractor shall repair any visible leaks and the repair method shall be approved by the City.
 2. Wrinkles/Fins
 - a. Wrinkles outside the flow line of the pipeline:
 - (1) Wrinkles/fins in height up to a maximum of 5% of the inside diameter of the host pipe are acceptable
 - (2) Wrinkles/fins over 5%, particularly those of a longitudinal configuration, may be acceptable and should be evaluated, by the project engineer for acceptance, on a case-by-case basis.

- b. Wrinkles in the flow line:
 - (1) Wrinkles/fins projecting more than 5% into the flow that are generally longitudinal in their orientation may be deemed acceptable by the City on a case-by-case basis by considering any potential operation and maintenance issues that would result from their being left in place.
 - (2) Wrinkles/fins in the lower third or flow line of the finished CIPP (based upon the depth of flow) that are generally circumferential in their orientation should not exceed 0.5-inches, whichever is smaller. Acceptability of larger wrinkles/fins meeting this characterization shall be, on a case-by-case basis by the City with consideration given to potential operations and maintenance issues that would result from their being left in place.
- c. Repair when wrinkles/fins are removed:
 - (1) Wrinkles should be fully cured, tight and the resin should be homogeneous across the full width of the wrinkle.
 - (2) In most cases, when wrinkles/fins are removed from the installed CIPP, the resin in the liner pipe is fully cured and homogeneous and no further repair is required. If a repair is required, the manufacturer should be contacted for the correct repair procedure.
- 3. Blisters should be probed and punctured to determine the existence of water behind the blister.
 - a. No action required unless the pipe is leaking at the blisters.
- 4. Lifts in Liner
 - a. Soft lifts should be re-processed by the Contractor to fully cure the CIPP.
 - b. Hard lift shall be removed, and a new short liner as required being equivalent to the original installed CIPP.
- 5. A bulge in the invert caused by residual debris left in the pipe that impedes the flow characteristics of the pipeline should be cut out.
 - a. Cut out the section of the bulge and replace with a new short liner equivalent to the original product or as recommended by the manufacturer.
- 6. Pinholes: the area where the liner has pinholes should be patched with a short-liner repair or the liner removed and replaced as recommended by the manufacturer.
- 7. Soft spot in liner needs to be reheated and hardened or cut out and replaced or as recommended by the manufacturer.
- 8. Dry tube or white spots are not acceptable and shall be removed and a patch repair shall be performed or as recommended by the manufacturer.
- 9. Liner surface peeled off
 - a. Cut out a representative sample of the CIPP
 - b. Test physical properties and remaining CIPP thickness to verify that the contract design requirements are met.
 - c. Replace liner or as recommended by the manufacturer
- 10. Hole in the liner is not acceptable
 - a. Small holes can be repaired with epoxy
 - b. Short liner installed over larger holes or as recommended by the manufacturer
- 11. Cracks in liner are unacceptable and shall be repaired
- 12. Loose liner seam tape shall be removed to prevent potential hang-up of debris.
- 13. Annular space between host pipe and liner at manhole

- a. If leaking between the host pipe and the CIPP, inject a hydrophilic type grout to stop the leakage.
- b. If the pipe is located in groundwater, inject a hydrophilic type grout to stop possible future leakage.
- c. If the pipe is not in groundwater, a cementitious grout can be used to fill the space.
- 14. Liner delamination
 - a. Cut out the section of delaminated liner and replace with a new short liner equivalent to the original product or as recommended by the manufacturer.
- 15. CIPP discoloration
 - a. Obtain a sample for testing the CIPP physical properties. Follow manufacturer's recommendations for repair.
 - b. Remove and replace the CIPP physical if the physical properties do not meet the contract minimum requirements.
 - c. No action required if the tested samples meet the physical properties.
- 16. Improper repair of CIPP: duct tape is not an acceptable repair for any situation.
- 17. The CIPP should fit tight inside the host pipe.
 - a. If the CIPP does not fit tightly against the original pipe at its termination point(s), the full circumference of the CIPP exiting the existing host pipe should be sealed by filling with a resin mixture compatible with the CIPP.
- 18. Overcut connection not allowed
 - a. Opening cut to match bottom of service pipe to eliminate debris build-up
 - b. If an overcut is made, grout the interface between the connection and the mainline
 - c. Install a connection hat
 - d. Install a short liner, then re-cut the service connection opening
- 19. Leakage between CIPP and host pipe at service connection
 - a. Leakage shall be stopped
 - b. Grout the interface between the connection and the mainline
 - c. Install a one piece main and lateral CIPP liner with end seals.
- 20. Connection hat issue
 - a. Coating from mainliner not removed before installing the hat
 - b. Loose material shall be removed
 - c. Remove and replace the connection hat as recommended by the manufacturer
- 21. Undercut service connection
 - a. Finish cut with brush to create a smooth opening
- 22. Resin slug in service connection
 - a. If not blocking the flow from the service connection and slug does not impede more than 20% of the connection opening, no action required
 - b. If blocking the flow, remove slug or dig up and replace the connection

C. Service Connections

- 1. The CIPP lateral lining shall not inhibit the CCTV post video inspection of the mainline or service lateral pipes.
- 2. Reinstatement of all lateral connections shall be done neatly and smoothly.

3.06 CLEAN-UP AND RESTORATION

- A. The Contractor shall not allow the site of the Work to become littered with trash and waste material but shall maintain the site in a neat and orderly condition throughout the construction period.
- B. On or before completion, the Contractor shall clean and remove from the site of the Work all surplus and discarded materials, temporary structures, stumps and portions of trees, and debris of any kind. He shall leave the site of work in a neat and orderly condition, similar or equal to that prior to construction.
- C. All private and public property along or adjacent to the Work disturbed by construction operations shall be restored to a condition similar or equal to that existing prior to construction.
- D. Before final acceptance by the City, the Contractor shall replace and/or restore any water, sewer, drain, and gas lines and appurtenances; electrical, telephone, telegraph conduits and wires, both underground and aboveground, and appurtenances; traffic signals, fire and police alarm systems and appurtenances; sidewalks, curbs, gutter, drainage ditches and pavements and all other public utility facilities and appurtenances along or adjacent to the Work that may have been disturbed by construction operations.
- E. Conditions permitting, property cleanup and restoration shall begin and be prosecuted to completion on a timely basis as set forth herein.

3.07 PROGRESSIVE CIPP INSTALLATION RECORD (SHOT RECORD)

- A. The Contractor shall provide a progressive CIPP Installation Record (Shot Record) with monthly application for partial payments. The progressive shot record shall indicate quantities actually installed and deviations to the parameters included in the shot record (i.e. shot number and corresponding manhole to manhole pipe reaches for each scheduled installation, design thickness, actual thickness delivered to the site, pipe diameter, reach length, total length of shot, and number of laterals).
- B. Monthly partial payments will not be approved without prior approval of the progressive CIPP Installation record (Shot Record) including verification and acceptance of all quantities by the City.

3.08 WARRANTY INSPECTION

- A. The City may conduct the warranty television inspection within 1-year following completion of the project. If it is found that any of the CIPP has developed abnormalities since the completion of the project, the abnormalities shall be repaired and/or replaced by the Contractor promptly as per these specifications and as recommended by the manufacturer.

END OF SECTION

SECTION 02772

CURE-IN-PLACE PIPE FOR LATERAL RENEWAL

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Renewal of existing sanitary sewer laterals by installation of a resin impregnated flexible felt tube into the existing lateral line utilizing a vertical inversion standpipe and hydrostatic head, pulled in place, or other approved method and curing by circulating hot water or other approved means to produce a hard, impermeable pipe.
- B. Work shall include the installation of cleanouts to access laterals to CCTV specific laterals listed in the Drawings. Contractor shall perform a pre-CCTV inspection of the laterals per Section 02763, "Televising Sanitary Sewers Laterals". City will determine upon review of the CCTV inspection which laterals will be renewed or replaced.
- C. Post CCTV inspection after renewal as per Section 02763 "Televising Sanitary Sewers Laterals."

1.02 REFERENCES

- A. Refer to Section 02771 Cured-In-Place Pipe for Sanitary Sewer Renewal paragraph 1.04 for applicable compliance standards. Include with these standards ASTM F2561, Standard Practice for Rehabilitation of a Sewer Service Lateral and Its Connection to the Main using a One Piece main and Lateral Cured-In-Place Liner.

1.03 INSTALLER EXPERIENCE AND QUALIFICATIONS

- A. Refer to Section 01001 General Work Requirements paragraph 1.01.C for minimum lateral work qualifications.

1.04 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Refer to Section 01001 General Work Requirements paragraph 1.17.i for responsibility of overflows and spills.


1.05 SUBMITTALS

- A. Submittals shall be submitted to the City for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals."
- B. Submit the following:
 - 1. The Qualifications of the installer shall be submitted 1-week prior to Pre-Construction

conference.

- a. Name: business address and telephone number of the Contractor
- b. Name(s) of all supervisory personnel to be directly involved with this project
- c. The Contractor shall sign and date the information provided and certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this project. Substitutions of personnel and/or methods will not be allowed without written authorization of the City.
- d. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the City.
- e. The Contractor shall provide his references of previous project lists going back 3-years including his customer's names, owner's contact name, phone number, owner's project number, City's project name and the list must include the number of laterals rehabilitated as well as the number and type of connection seals installed.

1. Product:

- (a) Fabric tube – manufacturer and description of product components
 - (b) Flexible membrane (coating) material and recommended repair (patching) procedure if applicable
 - (c) Raw resin data – manufacturer and description of product components
 - (i) Certificate of Conformity for resins that are used in CIPP lateral lining process. 06-08-2020 Conformed 
 - (d) Manufacturer's shipping, storage and handling recommendations for all components of the CIPP system
 - (e) All MSDS sheets for all materials to be furnished.
2. Certified copies of test reports of factory tests required by the applicable standards and this Section.
 3. Manufacturer's installation instructions and procedures.
 4. Method of cure and means to minimize quantity of styrene discharge back into the wastewater collection system.
 5. Method to minimize the safety risk to workers and the from exposure to hazardous chemicals associated with CIPP curing process.
 6. Contractor's procedures and materials for service renewal including time and duration of sewer service unavailability
 7. Interface seal or alternative seal.
 8. The thickness calculations signed and sealed by a Professional Engineer registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations shall be submitted to the City prior to CIPP installation.
 9. Sampling procedures and locations for obtaining representative samples of the finished liner.
 10. Both a pre-lining and post-lining digital data video shall be submitted for review and approval. The digital data video shall be clearly and properly labeled. A digital data video and suitable log shall be prepared by the Contractor during the Work and provided for review.

- C. A final certificate of compliance with this specification shall be provided by the manufacturer for all lining material furnished. Tests for compliance by an independent laboratory shall be

made according to the applicable ASTM specification and the manufacturer's quality control program.

- D. As part of the design calculation submittal, the liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at 5°F increments ranging from 70°F to 100°F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner. This information shall be submitted in a timely fashion prior to construction. The minimum liner thickness is for materials with characteristics as shown. Bidders with materials with other characteristics must supply complete information in their bids of the values as listed for ascertaining minimum thickness.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall be responsible for the delivery, storage, and handling of products. No products shall be shipped to the job site without the approval of the City.
- B. Keep products safe from damage. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The system proposed (materials, methods, workmanship) must be proven through previous successful installations to an extent and nature satisfactory to the City that is consistent with the size of the project being proposed. Since CIPP is intended to have a minimum 50-year service life, only products deemed to have this performance will be accepted.
- B. All CIPP lining products shall comply with the latest versions of ASTM D5813, ASTM F1216 and F2561, including appendices.
- C. Lateral connections to main shall be one piece main and lateral cured-in-place liners.

2.02 STRUCTURAL REQUIREMENTS

- A. The liner shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit to be repaired as specified by the City.
- B. The minimum required structural CIPP wall thickness shall be based on the physical properties described above and in accordance with the design equations in the appendix of ASTM F 1216, and the following design parameters:

Design Considerations	Criteria
Tube Design	ASTM F 1216 Appendix X1
Design Safety Factor	2.0
Retention Factor for Long Term Flexural Modulus to be used in Design	50 %
Ovality	2 %
Groundwater Depth = Pipe Depth (above invert) *	100% depth from pipe to surface
Lining enhancement factor	7 maximums
Soil Modulus	1,000 psi
Soil Density	120 pcf
Live Load	One (1) H20 passing truck
Design Condition	Fully deteriorated

C. Each CIPP shall be designed to withstand internal and/or external loads as dictated by the site and pipe conditions. When not specified by the City in the contract documents, the design thickness of the CIPP shall be arrived at using standard engineering methodology as found in ASTM F1216. In no case shall the finished thickness of the cured liner be less than three millimeters. The long-term modulus shall not exceed 50 percent of the short-term value for the resin system and shall be verifiable through testing. The thickness calculations, signed and sealed by a professional engineer registered in the State of Florida, shall be submitted to the City prior to CIPP installation.

D. When multiple layers are present, the layers of the finished CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or such that the knife blade moves freely between the layers. If separation of the layers occurs during testing of the field samples, new samples will be cut from the work. The composite of the materials will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods. The CIPP design for the lateral tube shall assume no bonding to the original pipe, in accordance with ASTM F1216. Any reoccurrence may be cause for rejection of the work. The cured liner shall meet TABLE 02772 - 1 Minimum Physical Properties.

TABLE 02772- 1
Minimum Physical Properties

Physical Characteristics	Test Procedure	Minimum Value
Flexural Strength	ASTM D790	4,500-psi
Flexural Modulus	ASTM D790	250,000-psi
Flexural Modulus (50-year)	ASTM D790	125,000-psi

2.03 MATERIALS

A. Lateral Liner Tube

1. The sewer service lateral liner shall be a single piece liner that lines the lateral and be a contiguous part of the mainline. The tube shall consist of 1 or more layers of a flexible needled felt or an equivalent non-woven or woven material, or a combination of non-woven and woven materials, capable of carrying resin, withstanding installation pressures and curing temperatures. The tube should be compatible with the resin system to be used on this project. The material should be able to stretch to fit irregular pipe sections and negotiate bends. Projected changes in groundwater level, temperature and other loading factors shall cause no significant changes in the service characteristics or service life of the sewer pipe liner. The liner will be continuous in length and the wall thickness shall be uniform. The tube will be capable of conforming to offset joints, bells, and disfigured pipe sections. The mainline liner will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the diameter of the mainline pipe. The resin will be polyester or vinyl ester with proper catalysts as designed for the specific application. The cured-in-place pipe shall provide a smooth bore interior. Installation will be accomplished remotely using air or water for inversion and curing. The cured pipe repair system shall be watertight and shall conform to the existing pipe and eliminate any leakage or connection to the outside of the host pipe/service.
2. The liner shall be polyester fiber felt tubing saturated with an epoxy vinyl ester or polyester resin prior to insertion which when cured, will be chemically resistant to reagents as defined in ASTM F1216, ASTM F1743, and ASTM D543 as applicable.
3. The system proposed (materials, methods, workmanship) must be proven through previous successful installations to an extent and nature satisfactory to the City that is consistent with the size of the project being proposed. Since CIPP is intended to have a minimum 50-year service life, only products deemed to have this performance will be accepted.
4. The lateral liner shall be fabricated under controlled conditions to a size that, when installed, will tightly fit the internal circumference and the length of the original conduit. Allowances should be made for the longitudinal and circumferential stretching that occurs during placement of the tube. Maximum stretching allowances shall be as defined in ASTM F1216 or ASTM F1743. The Contractor shall verify the lengths in the field before cutting the liner to length. The finished pipe liner in place shall be fabricated from materials which when complete are chemically resistant to and will withstand internal exposure to domestic sewage having a pH range of 5 to 11 and temperatures up to 150°F.
5. All CIPP lining products shall comply with the latest versions of ASTM D5813, ASTM F1216 and F2561, including appendices.
6. The tube shall be uniform in thickness and when subjected to the installation pressures shall meet or exceed the designed wall thickness
7. Any plastic film applied to the tube on what will become the interior wall of the finished CIPP shall be compatible with the resin system used, translucent enough that the resin is clearly visible, and shall be firmly bonded to the felt material.

8. At time of manufacture, each lot of liner shall be inspected and certified to be free of defects. The tube shall be marked for distance at regular intervals along its entire length, not to exceed 5-feet. Such markings shall also include the Manufacturer's name or identifying symbol.
9. Liners may be made of single or multiple layer construction where any layer must not be less than 1.5-mm thick and total minimum thickness is 3.0-mm. A suitable mechanical strengthener membrane or strip may be placed in between layers where required to control longitudinal stretching.

B. Resin Components

1. The resin system shall be a corrosion resistant epoxy vinyl ester or polyester that when properly cured within the tube composite meets the minimum requirements given herein or those that are to be utilized in the design of the CIPP for this project. The catalyst system may be accelerated to promote curing.
2. The resin used shall not contain non-strength enhancing fillers.
3. The Contractor shall submit the resin characteristics, including filler identification, to the City for approval prior to lining activities.

C. Interface Seal

1. The interface seal shall be a polyester impregnated, corrosion resistant fiberglass insert. The seal shall be of 1-piece construction and shall be designed such that when expanded shall tightly fit both T and Y connections at the interface between the mainline and lateral sewer. The seal shall extend into the mainline a minimum of 4-inches and shall provide a minimum of a 3-inch overlap inside the mainline pipe and be of equal thickness as the lateral liner at the interface.
2. An epoxy sealant rated for piping applications shall be applied to the seal to ensure that any gap between the interface of the mainline pipe and the CIPP lateral lining is air and watertight.
3. Alternative interfaces seals will be considered by the City. Only seamless type gaskets with a minimum profile of 2.5mm will be considered. Type of seals that will be considered are Hydrophilic End Seals compression gaskets (as referenced in F2561).

PART 3 - EXECUTION

3.01 DETERMINATION OF LATERALS TO BE LINED OR REPLACED

- A. Install cleanouts to access laterals for CCTV inspection for the specific laterals listed in the Drawings.
- B. Contractor shall perform a pre-CCTV inspection of the laterals per Section 02762, "Televising Sanitary Sewers". City will determine upon review of the CCTV inspection the quantity of laterals which will be renewed.
- C. After completing the video inspection, the Contractor shall provide the CCTV videos to the City for review and to determine which laterals requires renewal or replacement.

3.02 GENERAL

- A. The Contractor shall carry out his operations in strict accordance with all OSHA, State, local, and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving entering confined spaces. Curing with pressurized steam creates additional safety concerns regarding high temperatures, quick burn times, potential blow offs, etc. Contractors shall take additional precautions to ensure the safety of everyone nearby curing mechanisms.
- B. It is the intent of this specification to provide for the renewal of sewer service laterals by the installation of a resin-impregnated flexible tube and a mainline/lateral connection seal. The tube is either inverted or pulled into the original service lateral through a newly installed cleanout and then expanded to fit tightly against the lateral using water or air pressure. The resin system shall then be cured by elevating the temperature of the fluid (water/air) used for the inflation to a sufficient enough level for the initiators in the resin to affect a reaction. The finished pipe shall be such that when the thermosetting resin cures, the total wall thickness shall be a homogeneous and monolithic felt and resin composite matrix that will be chemically resistant to withstand internal exposure to domestic sewage.
- C. The system shall be provided with a seal at the mainline/lateral interface. The finished seal shall be such that when the thermosetting resin cures, the seal bonds to the lateral liner forming an airtight and watertight interface and will provide chemical resistance to domestic sewage.
- D. The Contractor shall deliver the liner to the site and provide all equipment required to insert the liner into the host pipe and cure it in place. The Contractor shall designate a location where the tube will be vacuum impregnated prior to installation. The Contractor shall notify the City at least 72-hours prior to wet out to allow the City to observe the materials and wet out procedure. All procedures to prepare the liner for installation will be in strict accordance with the manufacturer's recommendations. Any material not properly prepared shall be rejected and replaced with acceptable materials at the Contractor's expense.
- E. The liner shall be impregnated with resin and stored according with manufacturer recommendations.

3.03 PREPARATION


- A. Refer to Section 01001, general work requirements paragraph 1.16.c for notification of public or customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.

- B. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.
- C. The Contractor shall notify all residents affected by this construction at least 24-hours prior to any service disruption affecting their service connection. The mainline sewer shall be kept in operation during the lateral lining operations. Customers shall be notified by the Contractor with door hanger advising the customers of when the Work will begin, expected date of completion, the type of work and contact person for any questions.
- D. The Contractor shall install a cleanout at the respective right-of-way line, property line or easement line prior to or immediately after the lining procedure. Cleanouts shall be installed per the City's requirements as shown on the drawings and specified herein.
- E. The Contractor shall perform cleaning of the lateral and affected areas of the existing sewer line in accordance with the liner manufacturer's recommendations, videotaping, and inspection prior to installation of the CIPP lateral. The Contractor, when required, shall remove all internal debris out of the pipeline that will interfere with the installation of the CIPP. The Contractor shall provide an appropriate dumpsite for all debris removed during the cleaning operations. Precautions shall be taken by the Contractor to ensure that no damage or flooding of public or private property is caused by the cleaning operation.
- F. If, in the opinion of the CIPP liner manufacturer, the rate of infiltration in the sewer segment is high enough to risk washout of the resin then the Contractor shall perform measures, such as grouting or installation of a pre-liner, as required to minimize infiltration prior to installation. If during the pre-CCTV inspection any infiltration conditions are observed, the Contractor shall submit, in writing for approval by the Owner, the methods and materials for mitigating any adverse impacts from infiltration.
- G. It shall be the responsibility of the Contractor to notify the City of line obstructions, offset joints, or collapsed pipe that will prevent the insertion of the tube or significantly reduce the capacity of the lateral. The City with input from the Contractor shall determine the method of pipe repair required and shall address these concerns on a case-by-case basis.
- H. Protruding laterals or services shall be trimmed flush with the inside of the main sewer wall prior to lining. Trimming shall not cause damage to the lateral or service beyond the inside face of the main sewer.

3.04 PRETREATMENT OF REGULATED CHEMICALS TO DISCHARGE INTO SEWER

- A. CIPP liner systems using resins containing styrene or other regulated chemicals that will be discharged into the wastewater system may require a pretreatment plan to remove the regulated chemicals to acceptable levels prior to discharge. The discharge limits are as follows:

	Discharge Limits	
	Maximum Styrene Concentration Limit for Discharge (PPM)	Maximum Total Pounds per Day of Styrene to be Discharged (Pounds/Day)
Total Gallons of Discharge Including Water Added for cool down		
< 500,000	7	29
< 250,000	14	29
< 100,000	35	29

- (2) A single day's or line segment water discharge in excess of 500,000 gallons per day shall require approval by the City's Environmental Compliance Section for separate concentration limit evaluation and approval."
- (3) Discharge concentrations will be reduced based on the collection system distance from the City's Wastewater Treatment plant.
- B. A post-treatment cure water testing program will not be required for lateral renewal work unless the total gallons of discharge from curing exceed 50,000 gallons per day. Refer to paragraph 3.04.C should this volume of discharge be exceeded.
- C. After curing, the Contractor shall obtain a post-treatment cure water sample from the first segment lined in each Work Order and submit for laboratory analysis.
1. The following laboratory analysis is required:
 - a. One (1) sample to be collected from the treated water line segment and analyzed for "Styrene" using EPA Method 8260.
 - b. One (1) "Trip Blank" sample, analyzed for "Styrene" using EPA Method 8260.
 2. The Contractor shall submit the analytical report to the City for approval.
 3. The Contractor shall be responsible for all costs related to laboratory analytical testing of the water samples collected.
 4. Once the sample results demonstrate that the discharge limits have been met the Contractor shall follow similar styrene reduction procedures for subsequent lining segments, but sampling will not be required.
 5. The City reserves the right to obtain samples at any site on any line segment to ensure compliance with the discharge limits." 06-08-2020 Conformed 

3.05 BYPASS PUMPING

- A. When the flow demand on the lateral dictates that bypass pumping is required, the Contractor shall furnish all necessary pumping equipment, conduit, etc. to adequately and safely divert sewage flow around the Work in a manner approved by the City and as set forth in Section 01516 "Collection System Bypass." No flow shall be discharged on the surface, into storm sewers, in ditches, or in waterways.
- B. During a bypass operation, the pump shall be manned continuously: The Contractor shall maintain the pump and bypass equipment and shall be responsible for any damages to public or private property due to the malfunction of same.

3.06 CLEANING SEWER LINES

- A. Prior to any lining of a pipe so designated, it shall be the responsibility of the Contractor to remove all internal debris and clean the existing sewer line and/or lateral in accordance with Section 02761 "Cleaning Sanitary Sewer Systems." Both mainline and lateral line shall be cleaned.
 - 1. Preparation of the interior surface shall be accomplished by a thorough high-pressure water-jet cleaning. The pipe shall be left free of all loose sand, rock, or other deleterious materials. Any roots in the pipe shall be either removed or cut off flush with the interior.
 - 2. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning or where additional damage would result if cleaning is attempted or continued, the Contractor shall notify the City immediately. The City will determine what course of action will be taken to complete the project.
 - 3. Precautions shall be taken by the Contractor to ensure that no damage or flooding of public or private property is caused by the cleaning operation.
 - 4. The City shall inspect the prepared pipe for cleanliness and smoothness before the Contractor is authorized to proceed with pipe lining operations.
- B. Pipe Preparation: The liner method must be compatible with the existing mainline pipes interior coatings or materials that could cause a separation or a natural joint because of the lack of adhesion.

3.07 PRE AND POST TELEVISION INSPECTION

- A. Television survey shall be performed in accordance with Section 02763 "Televising Sanitary Sewer Laterals", including Pre-construction and Post-construction Surveys. The Contractor shall provide television equipment capable of properly documenting the conditions as found within the lateral. The camera equipment shall be capable of launching into the full length of each lateral and providing an accurate picture of the lateral to be lined. Lighting for the camera shall illuminate the entire periphery of the lateral.
- B. Both a pre-lining and post-lining digital data video shall be submitted to the City for approval. The Contractor shall launch into each lateral connection on both pre and post inspections. The digital data video shall be clearly and properly labeled. A digital data video


and a suitable log shall be prepared by the Contractor during the Work and provided to the City.

- C. The liner shall be continuous and free of all visual and material defects except those resulting from pre-lined conditions (such conditions shall be brought to the attention of the City prior to lining). There shall be no damage, deflection, holes, delaminating, uncured resin or other visual defects in the liner. The liner surface shall be smooth and free of waviness throughout the pipe. No visible leakage through the liner or at manhole or service lateral connections will be allowed. Any defects located during the inspection shall be corrected by the Contractor to conform to the requirements of the specifications and to the satisfaction of the City. The Contractor shall not reactivate any section of lined sewer pipe until authorized to do so by the City.

3.08 CIPP LINER INSTALLATION

- A. The CIPP shall be installed in accordance with the practices given in ASTM F1216 (for direct inversion installations) and ASTM F2561 (for one piece main and lateral cured-in-place liners). The quantity of resin used for the tube's impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances being made for polymerization shrinkage and the loss of any resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process shall be used in conjunction with a roller system to achieve a uniform distribution of the resin throughout the tube.
- B. The resin-impregnated tube shall be installed into the host pipe by methods approved by the manufacturer and proven through previous successful installations. The insertion method shall not cause abrasion or scuffing of the tube. Hydrostatic or air pressure shall be used to inflate the tube and mold it against the walls of the host pipe. There will be no use of sewage in place of clean water for insertion of the tube, or for the curing of the liner.
- C. The tube is to be installed at a rate sufficient to cause controlled installation of the tube into the conduit. The tube shall be installed in such a manner that no damage is done to the tube.
- D. Should there be any difference between the referenced requirements, the more stringent shall govern. Prior to construction, the Contractor shall submit to the City such written information which shall include, but not be limited to, storage and handling of lateral liner before installation, preparing liner for installation, installing the liner in the sewer lateral, temperature and pressure requirements for inverting and setting the liner, curing and cool down procedures, end seals and service restore.
- E. The Contractor shall always have on hand, for use by his personnel and the City, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.

3.09 CURING

- A. Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source input and output temperatures shall be monitored and logged during the cure cycles if applicable. The manufacturer's recommended cure method and schedule shall be used for each lateral line segment or sectional installed in consideration of the existing conditions and in accordance with applicable ASTM Standards. 06-08-2020 Conformed 
- B. After inversion is completed the Contractor shall supply suitable heat source and recirculation equipment. The equipment shall be capable of delivering heat throughout the section to uniformly raise the temperature above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed.
- C. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat supply. Thermocouples shall be placed between the tube and the host pipe to determine the liner temperature during cure. The water or air temperature in the pipe during the cure period shall be as recommended by the resin manufacturer.
- D. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the installation process, during which time the recirculation and cycling of the heat exchanger to maintain the temperature continues. The heat source shall be shut down during the post cure.
- E. Temperatures shall be monitored and recorded throughout the installation process to ensure that each phase of the process is achieved at the manufacturer's recommended temperature levels. Copies of these records shall be given to the City at the completion of each installation.

3.10 COOL DOWN

- A. Cool down may be accomplished by the introduction of cool water or air into the installation standpipe to replace the initial heating agent. The Contractor shall cool the hardened pipe to a temperature below 100°F before relieving the pressure in the pressure apparatus. A minimum period of post cure shall be maintained under a static head to provide a minimum hoop tension on the tube felt. Care shall be taken in the release of the static head so that a vacuum will not be developed.

3.11 INTERFACE SEAL INSTALLATION

- A. The interface seal between the mainline and the lateral shall be installed by remote device from inside of the sewer main. The seal shall be properly expanded with air pressure to

tightly fit the lateral interface.

- B. Seal installation shall be installed in strict accordance with the manufacturer's written specifications, recommendations and these specifications.
- C. The finished seal shall be continuous over the entire interface and be as free as commercially practical from visual defects such as foreign inclusions, dry spots and pinholes. The seal shall be homogeneous, impervious, and free of any leakage from the surrounding ground to the inside of the lined pipe. The interface seal shall not inhibit the post video televising of the mainline or the service lateral pipes.
- D. During the warranty period, any defects which will affect the integrity or strength of the seal, collect solids, or reduce hydraulic flow capabilities of the product shall be repaired at the Contractor's expense in a manner mutually agreed upon by the City and the Contractor.

3.12 CLEANUP

- A. After the installation work has been completed and all testing acceptable, the Contractor shall cleanup the entire project area. The Contractor shall dispose of all excess material and debris not incorporated into the permanent installation. The work area shall be left in a condition equal to or better than prior condition.

3.13 WARRANTY

- A. Refer to Section 01001 General Work Requirements paragraph 1.03.A for all warranties covering CIPP work.

END OF SECTION

SECTION 02773
SERVICE LATERAL CLEAN-OUTS FOR TELEVISION ACCESS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work: The Contractor shall install service lateral cleanouts on gravity mains, not being replaced, to perform the CCTV inspection of the service laterals. All costs of material, equipment, labor and other costs due to the unspecified field conditions shall be borne by the Contractor.
- B. Record Information: The Contractor shall submit to the City the locations and elevations of the clean-out tops.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All material supplied shall be one of the products specified in Appendix A "List of Approved Products" which is part of COSA Standards and Specifications appended to these technical specifications.

2.02 MATERIALS

- A. Polyvinyl Chloride Pipe and Fittings: Polyvinyl Chloride (PVC) Pipe shall meet the requirements of Section 15064 "Polyvinyl Chloride Pipe and Fittings."
- B. Concrete and Reinforcing Steel: Concrete and reinforcing steel shall conform to the requirements of Division 3 - Concrete. Concrete classes for the various purposes shall be as follows:
 - 1. Manhole bottoms, Class A
 - 2. Precast manholes, Class A (4,000-psi)
 - 3. Pipe and riser encasement, Class C
 - 4. Protective slabs, Class C
- C. Cement Mortar: Cement mortar for manhole construction shall comply with ASTM Designation C 270, Type M, except that the cement shall be Portland Type II only. No mortars that have stood for more than 1-hour shall be used.

PART 3 - EXECUTION

3.01 PREPARATION

- A. The interior of all pipe shall be thoroughly cleaned of all foreign material before being installed and shall be kept clean.
- B. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.
- C. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.
- D. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

3.02 INSTALLATION

A. Sewer Pipe

1. PVC Pipe

- a. Handling PVC pipe: The handling of PVC pipe shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Sections of pipe with deep cuts and gouges shall be removed and discarded at no expense to the City.

2. Building Laterals/Service Connections

- a. Service lateral connections shall be constructed in accordance with the details as indicated on the Drawings.
- b. All connections and changes of direction shall be made using standard fittings designed for that purpose.
- c. Locator balls shall be placed under all sanitary sewer service cleanouts.
- d. On curbed streets, the exact location for each service connection shall be marked by etching or cutting an "S" in the concrete curb. Where no curb exists or is planned, locations shall be marked by a method approved by the City.

3.03 FIELD QUALITY CONTROL

A. Workmanship: Clean-outs shall be built watertight.

B. Closed Circuit Television Inspection

- 1. Internal gravity sewer video inspection shall be performed by the Contractor to check for alignment and deflection. The television inspection shall also be used to check for cracked, broken, or otherwise defective pipe and overall pipe integrity.

SECTION 02959
SEWER MAIN AND LATERAL CONNECTION SEALING BY CHEMICAL GROUT

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for rehabilitation of defective mainline joints, circumferential mainline cracks, other small mainline defects and defective lateral-mainline interfaces by application of chemical grout material.
- B. Provide all labor, materials, tools, equipment and incidentals as shown, specified, and required for testing sewer pipe joints by applying a positive air pressure to the joints, monitoring and recording the pressure in the void. The intent of joint & connection testing is to identify those sewer joints, lateral connections and laterals that are not watertight and that can be successfully sealed by packer injection grouting. This document can be utilized for the following applications:
 - 1. Test all joints in a mainline segment
 - 2. Test all service lateral connections from the sewer main to a predetermined distance up the sewer lateral.
 - 3. Test all joints within a predetermined distance in laterals directly connected to manholes.
- C. Provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to grout pipeline joints, joints in laterals connected to manholes and lateral connections to the mains using the packer injection method.
 - 1. Packer injection grouting is used to reduce the infiltration within the pipeline, seal annular space between liners and host pipes at lateral connections, seal pipe joints that have failed the joint test criteria, provide external pipe support, but not a structural rehabilitation, by stabilizing soils outside the pipe and prevent further loss of pipe bedding into the pipe.
 - 2. Packer injection grouting shall be accomplished by pressure injection of chemical grout into the soils encompassing the exterior of pipe joint. Chemical grouts shall be designed to be injected into the soil surrounding the pipe, which stabilizes the soil and forms a permanent impermeable seal called a grout/soil ring, and into the annular space between liners and host pipes. Adequate volumes of grout must be injected to form an effective seal. Adequate amounts of grout are based generally upon pipe size and field conditions. This application will be through structurally sound joints and lateral connections through penetrations from within the pipe by using the packer method in tandem with a closed-circuit television (CCTV) inspection system.
- D. All contractors and employees' vehicles on the project site for the City shall clearly and boldly display their full name, address, and phone number.
- E. Maintenance of Traffic (MOT)
Refer to General Requirements Section 01570, Maintenance of Traffic requirements.
- F. All contractors and employees' vehicles on the project site for the City shall clearly and

boldly display their full name, address and phone number.

1.02 DEFINITIONS

- A. Mainline: Sewer Main.
- B. Lateral: Service pipe from property line to mainline.
- C. Lateral-Mainline Interface: Lateral connection to mainline.
- G. Lateral-Mainline Interface Seal: Watertight seal between lateral and mainline.

1.03 QUALITY ASSURANCE REQUIREMENTS

- A. Follow:
 - 1. ASTM F2304 Standard Practice for Rehabilitations of Sewers using Chemical Grouting, latest revision.
 - 2. ASTM F2454 Standard Practice for Sealing Lateral Connections and lines from the Mainline Sewer Systems by Lateral Packer Method, Using Chemical Grouting, latest revision.
- B. Commercially Proven Products:
 - 1. Minimum 12,000 mainline joints and 1,000 lateral-mainline interfaces successfully grouted and documented in the United States and Internationally.
 - 2. Translate international installations into English to Engineers approval.
- C. Personnel involved in sealing of joints and lateral connections: Certified by grout manufacturer they have successfully completed training in handling, mixing and application of grout for sanitary sewer line, joint and lateral connection sealing.
 - 1. Refer to Section 01001 General Work Requirements paragraph 1.02.E for grouting qualification requirements.
- D. Third-Party Inspector: Minimum of 5 years' experience in Chemical grouting applications and have no financial or directorial link to grout manufacturer or Contractor.
- E. Engineer may inspect and test grout at factory, before delivery to site, while in storage, or prior to use.
- F. Internally CCTV inspect host pipe prior to grouting, during grouting and post grouting.

1.04 SUBMITTALS

- A. Submit following Section 01300.
 - 1. Catalog data showing manufacturer's clarifications and updates, ASTM references, material composition, specifications, and physical and chemical properties of grout.
 - a. Chemical Grout Information:

- 1) Description of chemical grout materials.
 - 2) Description of proposed additives to be used.
 - 3) Manufacturers recommended procedures for storing, mixing, testing, and handling of chemical grouts.
 - 4) SDS sheets for all materials to be used.
 - b. Identify the manufactures & models of the packers to be utilized on the project.
2. Calculations of expected volumes of annular space between packer and pipe wall, to be used in calculating required gel times.
 3. Manufacturer's recommended procedures for handling, storing, mixing and injecting grout.
 4. Method of Construction.
 - a. Access manholes and site locations.
 - b. Work dimensions.
 - c. Size of working area.
 - d. Impacted portions of existing sewer.
 - e. Site access points.
 - f. Bypass pumping plan: Following Section 01516.
 5. Emergency plan detailing procedures to be followed in event of health and safety emergency, pump failures, sewer overflows, service backups, and sewage spillage. Maintain copy on site for duration of project.
 - a. Address dangers associated with sewer rehabilitation work.
 - b. Identify Health and Safety officer. (i.e. crew chief)
 - c. Designated Health and Safety officer:
 - 1) Responsible for providing health and safety oversight of personnel participating on project team.
 - 2) Perform and document routine work area inspections, conduct safety meetings, and provide safety orientations for team members.
 - 3) Have in easily accessible location, the following contact information
 - a) Non-emergency number.
 - b) Contractor's health and safety representative name and number.
 - c) Occupational health clinic number(s).
 - d. Submit for review the following;
 - 1) List of critical rehabilitation equipment, to be inspected on daily basis.
 - 2) Recently completed (previous month) monthly maintenance log.
- B. Submit following Section 01300.
1. Grout manufacturer's certification that Contractor is approved installer of their system. Certificates of training in handling, mixing, and application of grout for sanitary sewer line and joint and lateral connection sealing for grout truck operator and at least one crewmember involved in sealing process.
 2. Third party lab test results for field installations in United States of same grout system as proposed for actual installation.
 - a. Test results must verify grout physical and chemical properties specified herein have been achieved in previous field applications.

3. CCTV inspection reports and electronic downloads following 02762 and 02763 before and following sewer joint sealing. Furnish original copies of CCTV inspections color DVDs to Engineer within 10 days.
4. Documentation for Products and Installers: Engineer's approval required before acceptance or injection of grout.
5. Proof of grout manufacturer's product liability insurance, if requested by Engineer.
6. Pump calibration information.
7. Field sealing records.
8. Certification of accuracy and calibration of pressure sensing/monitoring equipment by independent testing firm within one month before use of equipment.
9. Upon completion of each pipe segment, submit a report showing the following data for each joint and/or lateral connection tested, grouted or attempted to be grouted in accordance with NASSCO PACP.
 - a. Identification of the sewer pipe section tested by assigned sewer ID (if available) and length.
 - b. Type of pipe material, diameter & depth of pipe to the surface at manholes.
 - c. Length of pipe sections between joints.
 - d. Test pressure used and duration of test.
 - e. Pass/fail results for each joint/connection tested.
 - f. Location stationing of each joint/connection tested, and location of any joints/connections not tested with an explanation for not testing.
 - g. Volume of grout material used on each joint or connection.
 - h. Gel set time used (cup test results from tanks)
 - i. Grout mix record of the batches mixed including amount of grout and catalyst, additives, temperature of the grout solution in tanks.
 - j. Operator conducting testing and sealing shall be noted on the reports.
 - k. Video recordings
 - 1) Video recording shall include testing and sealing operations for each joint/lateral (including inflation and deflation over the joint/lateral) displaying the final air test of joints or laterals.
 - 2) Additional final recording, if specified, shall include inspection of the pipe or lateral after all grouting work is complete.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect, store, and handle grout or other material during transportation and delivery, while stored on-site, and during installation following manufacturer's recommendations.
- B. Grout Material found defective or damaged due to manufacture or shipment:
 1. Remove from Contract site and replace, following Engineer's direction, at no cost to the Commission.

PART 2 - PRODUCTS

2.01 TESTING EQUIPMENT & GROUTING EQUIPMENT

- A. The basic equipment used for mainline pipe joints and for laterals connected to the mainline shall consist of a remotely operated color television camera capable of pan and tilt, joint testing device (referred to hereafter as a packer), and test monitoring equipment. The equipment shall be constructed in such a way as to provide means for introducing air under pressure into the void area created by the expanded ends of the packer against the host pipe and a means for continuously measuring, viewing and recording the actual static pressure of the test medium and grout within the void area only. The packer shall be of a size less than the diameter of the host pipe, with the cables at either end used to pull it through the line and may always be constructed in such a manner as to allow a restricted amount of sewage to flow. Packer shall be expanded by air pressure. Packers shall be of low void space construction with void volume given by the packer manufacturer.
- B. The device for testing lateral connections shall consist of inflatable mainline end elements and a lateral grouting plug that creates a void area extending beyond the main connection. Whenever possible, use a lateral grouting plug sized to match the diameter of the lateral being grouted with an effective sealing length of at least PREDETERMINED DISTANCE BY ENGINEER. Where the lateral is capped, utilize alternate lateral grouting plug or equipment sized appropriately for the capped lateral. In cases where the lateral transitions from 6" to 4" in diameter, use a 4" lateral grouting plug. However, it is possible that due to physical restrictions the lateral plug may not launch and thus the service may not be able to be grouted.
- C. The basic equipment for 4-inch and 6-inch laterals connected to manholes shall consist of a flexible push-type packer and mini-push camera. The device for testing lateral pipe connected to the manhole shall be capable of testing the joints within PREDETERMINED DISTANCE BY CITY of the lateral or to the cleanout, whichever comes first, from the manhole toward the building. If the lateral contains a transition, CONTRACTOR may change out diameters of push packer or grout lateral using only a 4-inch push packer.
- D. Void pressure data shall be transmitted from the void area to the monitoring equipment or video picture of a pressure gauge mounted on the packer and connected to the void area. All test monitoring shall be above ground and, in a location, to allow for simultaneous and continuous observation of the televising monitor and test monitoring equipment.
- E. Grouting equipment shall consist of the packer, appropriate pumping and hosing systems capable of supplying an uninterrupted flow of sealing materials to completely fill the voids. Grout pumping system shall be sized to deliver a mixed volume of grout at a minimum of 3 gpm and 30 gallons of uninterrupted flow within 10 minutes.
- F. Volume of mixed grout pumped must be capable of being measured and recorded for each grouted joint/connection. Generally, the equipment shall be capable of performing the specified operations in sewers where flows do not exceed 25 percent of pipe diameter unless permitted by CITY.

- G. Connection and lateral service sealing shall be accomplished using the lateral grouting plugs and push packers specified above. Always provide back-up bladders for each packer on-site during grouting procedures.
- H. Equipment for cleaning lateral blockages shall be readily available while any lateral grouting work is being performed.

2.2 MATERIALS

A. Grouts - General

1. While being injected, the grout must be able to react /perform in the presence of water (groundwater).
2. The ability to increase grout mix viscosity, density and gel strength by increased concentration of constituents or the use of approved additives.
3. The cured grout must withstand submergence in water without degradation.
4. The resultant grout formation must be homogeneous and prevent the passage of water (infiltration) through the pipe joint.
5. The grout must not be biodegradable.
6. The cured grout should be chemically stable and resistant to organics found in sewage.
7. Residual grout shall be easily removable from the sewer line to prevent blockage of the sewage flow.
 - a. Handle, mix, and store grout in accordance with the manufacturer's recommendations. The materials shall be delivered to the site in unopened original manufacturer's containers.

B. Grouting.

1. Properties and Characteristics.
 - a. Will perform in presence of infiltrating water (groundwater), during injection.
 - b. Packaged for field storage, handling requirements with minimum spillage and worker safety.
2. Cured grout:
 - a. Submergible in water without degrading.
 - b. Not biodegradable.
 - 1) Additives may be used to meet this requirement, without effecting long-term strength.
 - c. Chemically stable and resistant to concentrations of acids, alkalis, and organic materials found in normal sewage.
3. Composition.
 - a. Acrylamide gel:
 - 1) Minimum of 10 percent acrylamide base material by weight in total grout mix.
 - 2) Higher concentration percent of acrylamide base material (maximum 20%) may be used to increase strength or offset dilution during injection.
 - 3) Able to tolerate some dilution and react in moving water during injection.
 - 4) Approximately 2 centipoise viscosity. Can be increased with additives.
 - 5) Constant viscosity during reaction period.
 - 6) Controlled reaction time from 10 seconds to 1 hour.

- 7) Curing reaction producing a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
 - 8) Able to prevent dehydration and increase-mix viscosity, density and gel strength by use of additives.
 - a) Diatomaceous earth (Celite 209 or equal) can be added to concentration of five percent.
 - b) Use of other additives following manufacturer's recommendation and Engineer's approval.
 - 9) Root control additive 2, 6-Dichlorobenzonitrile, may be added following manufacturer's recommendation and Engineer's direction.
- b. Urethane gel:
- 1) Ratio: One-part urethane prepolymer mixed with 5 to 10 parts water by volume.
 - a) Recommended mix ratio: 1-part urethane prepolymer to 8 parts of water (11 percent prepolymer).
 - 2) Liquid prepolymer:
 - a) Solids content: 77 to 83 percent.
 - b) Specific Gravity: 1.04 (8.65 pounds per gallon)
 - c) Flash Point: 20 degrees F.
 - d) Viscosity: 600 to 1,200 centipoises water at 70 degrees F.
 - 3) Water for reacting prepolymer: pH of 6.5 to 8.
 - 4) Curing reaction:
 - a) Produces chemically stable, non-biodegradable, tough, flexible gel.
 - b) Able to increase mix viscosity, density, gel strength and resistance to shrinkage by using additives in water component of grout.
 - c) Minimum 15 percent shrink control agent supplied by the same manufacturer.
- c. Acrylate gel:
- 1) Minimum 10 percent acrylate base material by weight or as specified by the manufacturer.
 - a) In total grout mix, a higher concentration (percent) of acrylate base material may be used to increase strength or offset dilution during injection.
 - b) If acrylate base material is in 40 percent solution 27.5 percent by weight of total grout mix: 11 percent base material.
 - 2) Able to tolerate some dilution and react in moving water during injection.
 - 3) Viscosity: Approximately 2 centipoises.
 - a) Can be increased with additives.
 - 4) Constant viscosity during reaction period.
 - 5) Controlled reaction time: 10 seconds to 1 hour.
 - 6) Curing reaction producing homogeneous, chemically stable, non-biodegradable, flexible gel.
 - 7) Able to prevent dehydration and to increase-mix viscosity, density and gel strength by use of additives.
 - a) Diatomaceous earth (Celite 209 or equal) can be added to concentration of five percent, by volume.
 - b) Use of other additives following manufacturer's recommendations and Engineer's approval.

- 8) Root control additive 2, 6-Dichlorobenzonitrile, may be added following manufacturer's recommendation and Engineer's direction.

C. Additives

1. At the CONTRACTOR'S discretion and according to field conditions, additives may be selected and used within the manufacturers recommended quantities.
2. Strengthening Agents
 - a. For joint grouting, a latex or "diatomaceous earth" additive may be added to increase compressive and tensile strength. The quantity of strengthening agent additive shall be as recommended by the manufacturer and approved by ENGINEER. Product Manufacturer:
3. Root Inhibitor
 - a. When roots are present, for joint and lateral connection joint grouting, a root deterrent chemical shall be added to control root re-growth. The quantity of inhibitor shall be as recommended by the manufacturer and approved by ENGINEER.
4. Dye - A manufacturer approved water soluble dye without trace metals may be added to the grout tank(s) for visual confirmation.
5. Gel Time Modifier - A gel time extending agent may be used in accordance with the manufacturer's recommendations to extend gel time as necessary.
6. Freeze/Thaw - In those lines where the grouting material may be exposed to a freeze-thaw cycle, ethylene glycol or other ENGINEER approved additive shall be used to prevent chemical grout cracking once set.
7. When using non soluble additives the grout tanks must have mechanical mixing devices to keep the additives in suspension and maintain a uniform solution of grout and additive.

2.2 EQUIPMENT

A. General.

1. CCTV system, necessary chemical grout containers, pumps, regulators, valves, hoses, joint sealing packers for various sizes of sewer pipes, and lateral bladders.
2. Air pressure monitoring system:
 - a. Configured with no valves on air line between measuring point and pressure sensing device.
 - b. Digital readouts located at control panel in grouting truck.

B. Grouting packer:

1. Diameter less than pipe size, with cables attached at each end to pull it through the line.
2. Designed to allow restricted amount of sewage to flow through device, in mainlines where sewage flows do not exceed maximum depth for joint testing/sealing following manufacturer's recommendation and following ASTM F2304 and ASTM F2454.
3. Approved Manufacturers:
 - a. Logiball, Inc.
 - b. Cues, Inc.
 - c. Or Equal.

PART 3 - EXECUTION

3.1 PUBLIC NOTIFICATION

- A. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained that the business is open. No sewage from the services or main line shall be discharged on the ground or in waterways.

2.

3.2 PREPARATION

A. Access.

1. Chemical grout sealing of mainline sewers: Through existing manholes.
4. Chemical grout sealing of lateral-mainline connections: Through mainline sewers.

B. Sewer Cleaning and Surface Preparation.

1. Cleaning of Main Line Sewers and Laterals.
 - a. Hydraulic high-pressure jetting of reaches is permitted.
 - b. Before sealing work, lightly clean each line section.
 - c. Remove sludge, dirt, sand, grease, root, and other materials from pipe and collect and remove resulting debris from downstream manhole of sewer section being cleaned.
 - a. Collect debris and remove from site. Following jurisdictional requirements and Engineers' approval.
 - e. Sewers damaged as result of improper use of cleaning equipment: Promptly repaired at no additional cost to the Commission.
 1. Clean sewer main within 72 hours before chemical grouting of sewer lateral connections.

C. Pre-sealing CCTV Inspection.

1. After cleaning, perform CCTV inspection to ensure main is sufficiently clean to perform sealing operations. Document protruding taps and structural defects found during the CCTV inspection.
 - a. If Engineer finds main is not sufficiently cleaned, remove CCTV and sealing equipment and re-clean at no additional cost to the Commission.
 - b. If light cleaning is not sufficient, heavy clean sewer following Section 02761.

D. Pre-sealing Reaming.

1. Ream or trim protruding taps following Section 02766.

F. Bypass Pumping: Before pre-sealing CCTV inspection, and joint testing and sealing can be performed, depth of flow should be at or below levels shown in table.

1. If necessary, bypass pump to bring flow levels down to acceptable levels.

Pipe Diameter (inches)	Maximum Depth of Flow (as % of Pipe Diameter)
6 to 10	20
12 to 24	25
27 or greater	30

G. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

H. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

3.3 TESTING

A. Performance Test Demonstrations.


1. Before start of work, verify accuracy and repeatability of void pressure meter and fluid pumping equipment.
2. If test demonstrations fail to show accuracy of +/-0.5 psi for void pressure repeatability and +/- 0.1 gallon of chemical pumped into measured container or bucket, make required repairs or adjustments to equipment and gauges and retest until results meet Engineers satisfaction.
3. Test may be required at commencement of each work shift during sealing operations.
4. Perform demonstration testing may be performed each day of grouting. This testing may be waved by the City. 06-08-2020 Conformed

B. Mainline Joint Pressure Air Testing.

1. Before testing, perform control tests at ground surface to verify accuracy, integrity, and reliability of testing equipment following ASTM F2304.
2. After entering each pipe segment through manhole, and immediately before joint pressure air testing, perform an intermediate test on pipe between joints following ASTM F2454.
3. Maintain joint testing air pressure of 3 psi higher than groundwater pressure outside the pipe, up to maximum of 10 psi. If groundwater pressure data is not available, use joint testing pressure of 0.5 psi per vertical foot of pipe depth or 10 psi, whichever is greater.
4. Perform testing following ASTM F2304. Seal joints that do not maintain void pressure drop of less than 1 psi in 15 seconds.
5. When the joints are longitudinally cracked, fractured or broken testing will not be required. 06-08-2020 Confirmed

C. Lateral Connection Pressure Air Testing.

1. Before lateral connection testing, perform control tests at ground surface to verify accuracy, integrity and reliability of testing equipment following ASTM F2454.

2. Maintain joint testing air pressure of 3 psi higher than groundwater pressure outside the pipe, up to maximum 6 psi. If groundwater pressure data is not available, use joint testing pressure of 0.5 psi per vertical foot of pipe depth or 6 psi whichever is greater.
3. Perform lateral connection testing following ASTM F2454. Seal joints that do not maintain void pressure with pressure drop of less than 2 psi in 15 seconds.
4. If the service lateral connection at the main is longitudinally cracked, fractured or broken pre-testing will not be required. 06-08-2020 Conformed 

3.4 BASIC REQUIREMENTS

A. General.

1. Seal joints, defects or leaking lateral connections that failed air testing or show sign of visible leaks, by internal chemical methods, as directed by Engineer.
2. Grouting of service lateral is prohibited if the grouting location cannot be inspected before and after the sealing procedures.
3. Service laterals cannot be sealed from the mainline when the packer cannot be seated.
4. Protruding laterals are to be cut back within 5/8" prior to sealing.
2. After sealing of joint, defect or connection, perform post air test per ASTM F2304 or ASTM F2454 for mainline sewer sealing and lateral sealing, respectively.
3. Sewer that Engineer deems damaged as a result of Contractor's operations, will be promptly repaired to Engineer's satisfaction at no cost to the Commission.
5. Grouting materials that set to a hard, rigid product capable of intrusion into sewer lines are not acceptable unless specifically approved by Engineer on a case by case basis.
6. Post sealing flow verification is to be made to document the lateral service has been returned to service with unrestrained flow.
7. Provide qualified, independent third-party inspector to observe grouting mixing process, chemical grouting injections process and post grouting pressure testing. Report findings to Engineer.

B. Grout Preparation.

1. Follow the manufacturer's recommendations for the mixing and safety procedures.
2. Adjust gel time as necessary to compensate for changes in temperature in grout component tanks or hoses. The addition of dilution water to extend gel times is not acceptable unless resulting base grout tank only material exceeds 20% by weight for solution grouts.
3. During the grouting process, the Grouting Technician shall monitor the grout component tanks to make sure that proper ratios are being pumped. If unequal levels are noted in the tanks, repeat the pump test as described above and correct any defective equipment.
4. Gel times shall be calculated using the following formula unless CONTRACTOR experience and/or field conditions dictate otherwise. Any alterations of the gel time formula shall be approved by the City.

$$\text{Gel Time} = (\text{Volume of Pipe/Packer Void Space (gal)} / \text{Pumping Rate (gpm)}) (60 \text{ Sec}/1 \text{ Min}) + 20 \text{ Sec (+/- 5sec)}$$

5. Packer/Pipe void shall be defined as the volume between the inflated packer and the inside pipe wall when the packer is inflated per manufacturer recommendations. For example: an 8" pipe with a packer void space of 0.3 gallons and a 3 gpm pumping rate would provide

$$\text{Gel Time} = (.3 \text{ (gal)}/3 \text{ (gpm)}) (60\text{sec}/1 \text{ Min}) + (20 \text{ sec}) = 26\text{sec} (+/- 5\text{sec})$$

C. Grouting General.

1. Grout all joint and lateral connections that failed the pressure test by the injection method. This shall be accomplished by forcing grout through a system of pumps and hoses into and through the joints of the sewer from the packer within the sewer pipe. Remove excess grout from pipe and laterals. Excess grout shall be defined as a thickness of grout that given its location, size and geometry, could cause a blockage. Flush or push forward to the next downstream manhole, remove from the sewer system, and properly dispose of excess grout.

D. Application Procedures for Joint Sealing and Lateral Connection Sealing.

1. Force chemical grouting material into or through faulty joints, defects or lateral connection by system of pumps, hoses, and sealing packers.
 - a. Position packer over faulty joint or lateral connection by means of measuring device and CCTV camera in line.
 - b. For mainline sewers, expand packer end bladders using controlled pressure. For lateral connections use lateral packer equipped with lateral bladder and rotating mechanism.
 - 1) Obtain a tight seal. If a tight seal is not obtained, remove equipment and make adjustments.
 - 2) Pump grout material through hose system at controlled pressures high enough to overcome external pressures such as groundwater pressures.
2. Design pumping unit, metering equipment, and packer devices so proportions and quantities of materials can be regulated following type and size of leak being sealed.
3. Set chemical pumping rates and mixing ratios as specified herein, following manufacturer's recommendations and Engineer's adjustments.
4. Determine appropriate gel set times.
 - a. To estimate gel set times, divide estimated volume of annular space (in gallons) by grout pumping rate (in gallons per minute), then add between 15 to 25 seconds. Adjust estimate by considering temperature of grout tanks, temperature of hoses, temperature of groundwater, amount of groundwater present and other field conditions.
 - b. The gel set time is typically between 20 and 40 seconds. Gel set times of less than 20 seconds may be required in presence of high filtration.
 - c. Monitor induction periods and gel characteristics through daily gel time tests for each sealing vehicle. Check each new batch once. If only one batch is used, check at least twice per day.
 - d. Perform new gel time test when grout additives are modified to change gel times, at beginning of new setup with new starting manhole, or when temperature in tanks and hoses changes by more than 10 degrees F from previous gel time test.

- e. Use water with known and controlled pH that will be used during actual grouting operations.
 - f. Allow grout mixture to settle to remove entrained oxygen, before testing gel time.
 - g. Use plastic or stainless-steel tanks. Do not use tanks that contain iron or copper.
5. During seal operations, operate void pressure monitoring equipment, described herein.
6. Integrate CCTV, grout pumping, and air pressure monitoring equipment so proportions, quantities, and void pressure for materials and sealing can be instantly monitored and regulated following type and size of joint, break, or leak.
7. Amount of chemical being pumped: Based on number of pumped strokes delivered for each sealed sewer main joint, defect or leaking connection.
- a. Record and provide results to Engineer.
8. If large voids are encountered on outside of sewer, including the possibility of “piping” holes to ground surface, which could cause excessive use of grout material, at Engineer’s direction change operating pressures and pumping rates as follows.
- a. Reduce pressures and pumping rates, such that intervals between pump strokes are shorter than gel time.
 - b. Pump first stage of grout, and then stop pumping until temporary gel of the grout is obtained on outside of pipe.
 - c. Increase pressure and pumping rate to pump the second stage and form a second layer.
 - d. Repeat this cycle until refusal conditions are reached, or until the inspector judges the grout consumption to be excessive.
 - e. Avoid sealing inner surface of pipe from inside before building up layers on the outside.
9. Grout injection complete: When chemical grout is pumped to refusal as defined in ASTM F2304.
- a. If chemical grout cannot be pumped to refusal, within a volume less than or equal to 0.5 gallons per inch of pipe diameter due to latent physical conditions, do not perform additional work until Engineer grants authorization.
 - b. Lateral connections: When back pressure of grout in void at mainline level drops from 8 psi to 6 psi in greater than 20 seconds after cessation of grout pumping, following ASTM F2454.
 - 1) If using stage grouting, grout injection is complete when refusal pressure of 8 psi is achieved.
10. Sealed Defects.
- a. Remove excess grout gel ring if obtrusive and impedes air testing and CCTV inspection of work as required. If excess grout gel ring cannot be removed by use of packer, jet clean pipe prior to testing seal.
 - b. Air test each sealed joint.
 - 1) If defect or connection fails air test after grout injection, reseal failed joints and air test again.
 - 2) After lateral connection has been sealed successfully as confirmed by post air test, break lateral packer seal and test service to assure grout has not blocked lateral connection further upstream.

- a) In the event sewage back-up occurs and enters a dwelling, respond within 2 hours of being notified and be responsible for cleanup, repair, property damage costs and claims.
 - c. After all pipe joints and lateral connections have been grouted, retest all previously unsealed pipe joints and lateral connections. Seal any pipe joints and lateral connections that do not pass the air pressure test.
 - d. Payment for post testing of grout sealed joints is to be included in the grouting unit price. 06-08-2020 Conformed
11. Flush or push forward excess grouting material to next downstream manhole and remove from sewer system.
- a. Dispose of debris following grout manufacturer's recommendation, and jurisdictional regulations.
 - b. Excess grout material from upstream section(s) will not be allowed to accumulate in sewer.
12. Provide approved plug and/or by-pass pumping if grouting operations restrict or prevent simultaneous sewage flow passage.
- a. Refer to Section 01516 Collection System Bypass article 1.01 Scope of Work for sewer bypass requirements.
- E. Joint, Defect or Lateral Connection Sealing Verification.
- 1. Mainline joints and defects.
 - a. Deflate packer bladders after completing each seal until zero void pressure (± 0.5 psi) is shown on the monitoring equipment.
 - b. If zero void pressure (± 0.5 psi) is not achieved, clear residual grout material from packer or make needed equipment adjustments allowing true pressure reading.
 - 2. Re-test joint, defect or lateral connection as described herein.
 - a. Re-seal joints, defects, or connections that do not meet specified test criteria and re-test until test criteria are met, or Engineer determines that joint defect, or lateral connection cannot be sufficiently sealed.
 - b. Additional testing and sealing will be at no additional cost to the City.
- F. Residual Sealing Material.
- 1. Leave no residual grout material capable of reducing pipe diameter or restricting flow greater than 5 percent pipe capacity.
- G. Obstructions.
- 1. During course of sealing operations obstructions may be encountered preventing travel of packer and camera.
 - a. Should obstruction not be passable, begin sealing operations from opposite end of sewer reach.
 - 2. If additional obstructions are encountered after re-employment and no means are available for passing obstructions without damage to equipment, remaining sections of sewer main not sealed may be temporarily excluded from work requirements of Contract, until point repair is completed.

3.5 FIELD DOCUMENTATION

A. Records.

1. Keep complete, accurate, and legible records of operation for each joint, defect or connection sealed.
 - a. Include on Record of Operation for each joint or lateral mainline interface tested and/or routed or attempted to be grouted:
 - 1) Identification of work site, complete component, address, county page & grid, 200-foot sheet.
 - 2) Date and time.
 - 3) Station of each seal measured from upstream manhole.
 - 4) Location of any joints not tested and reason for not testing.
 - 5) Grout mixture formation, including additives and catalyst mixture.
 - 6) Test pressures and durations of tests maintained for each joint passing the air test.
 - 7) Ambient outside air temperature at time of grout injection.
 - 8) Grout tank temperatures.
 - 9) Gel time and time last verified.
 - 10) Verified address of lateral.
 - 11) Estimated visible leakage (gpm) from joint/defect connection or lateral.
 - 12) Number of pump strokes and amount of grout in place.
 - 13) Beginning, ending, pressure losses, re-test pressures.
 - 14) Verification lateral is clear after sealing process.
 - 15) Remaining leakage and location after seal (gpm).
2. Work site will not be accepted until Engineer receives original record.
 - a. Failure to fill out logs completely will result in non-payment for the questioned mainline joint, defect or connection.

3.6 WARRANTY

- A. Provide twelve month performance and workmanship warranty for the seals from date of acceptance and final Work Order invoice payment.
- B. Perform CCTV inspections during the first wet weather season after initial sealing, to evaluate quality of the initial sealing.
- C. CCTV inspect initial retest area consisting of 10 percent of grouted joints and 10 percent of grouted lateral connections following Sections 02762 and 02763.
- D. Provide qualified, independent third-party inspector to review CCTV inspection videos to verify integrity of seals.
- E. Reseal all joints sealed under this Contract that inspector finds defective within warranty period, at no additional cost to the City.
 1. Defective seals include, but not limited to those with root penetration, signs of infiltration, and cracks in pipe or grouting material.


- F. If failure rate of retested joints and lateral connections is 5 percent or less of joints and lateral connections retested, work shall be considered satisfactory and no further retesting will be required. If the failure rate of retested joints and lateral connections is greater than 5 percent, the Engineer shall randomly select another retest area consisting of another 10 percent of the initially sealed joints and lateral connections. Continue this additional retesting and resealing until a failure rate of less than 5 percent is met.

3.7 ACCEPTANCE

- A. When sealed joint, defect, and lateral connections pass the post air test.

PART 4 MEASUREMENT AND PAYMENT

4.1 PERFORMANCE DEMONSTRATION TESTING

- A. Measurement: Equipment calibration demonstrated.
- B. Payment: Unit price line item TS1. 06-08-2020 Conformed 

4.2 TEST AND SEAL MAINLINE JOINT OR DEFECT

- A. Measurement: By each joint pre-tested.
- B. Payment: Unit price line item TS2.
1. Payment includes all work necessary to perform testing.
- C. Measurement: By each joint grouted, post-testing.
- D. Payment: Included in each GSx line item unit price.

4.3 TEST AND SEAL LATERAL CONNECTION

- A. Measurement: By each lateral connection pre-tested.
- B. Payment: Unit price line item TS3.
- C. Measurement: By each connection grouted, post-testing.
- D. Payment: Included in Unit price line items GS1.

4.4 SEALING MATERIAL

- A. Measurement: By gallon of grout used, over initial two gallons per joint or lateral connection.
- B. Payment: At unit price listed in Unit Price Schedule.

1. Payment includes materials, additives, storage, calculations, mixing, testing for in-place percentage and gel time tests.

4.5 RETESTING SEALED JOINTS UNDER WARRANTY

- A. Measurement: By unit price for each required item of work.
- B. Payment: At contingent price listed in Unit Price Schedule.
 1. Payment includes work related to retesting of sealed joints including cleaning, CCTV inspection, and air testing in the initial retest area only.
 - a. No compensation will be provided for resealing joint that fails air testing or any additional testing beyond initial retest area.

06-08-2020 Conforme 

END OF SECTION

EXHIBIT B - INSURANCE REQUIREMENTS

Contractor shall acquire and maintain until completion of the Work the insurance coverage listed below, which constitutes primary coverage. Contractor shall not commence the Work until the City receives and approves Certificates of Insurance documenting required coverage. Contractor's General Liability policy shall include Endorsement CG 20101185, or equivalent, naming the City of St. Augustine ("City") as Additional Insured. All required policies shall include: (1) endorsement that waives any right of subrogation against the City for any policy of insurance provided under this requirement or under any state or federal worker's compensation or employer's liability act; (2) endorsement to give the City no less than thirty (30) days notice in the event of cancellation or material change. Certificates of Insurance must be accompanied by copies of the requested endorsements.

Any deductibles or self-insured retentions above \$100,000 must be declared to and approved by the City. Approval will not be unreasonably withheld. Contractor is responsible for any deductible or self-insured retention. Insurance must be placed with insurers having an A.M. Best rating of A-V or greater. City receipt of insurance certificates providing less than the required coverage does not waive these insurance requirements.

- (a) **Workers' Compensation Insurance.** Workers' compensation and employer's liability coverage, including maritime workers compensation, if applicable, in not less than the minimum limits required by Florida law. If Contractor claims an exemption from workers' compensation coverage, Contractor must provide a copy of the Certificate of Exemption from the Florida Division of Workers' Compensation for all officers or members of an LLC claiming exemption who will be participating in the Work. In addition, Contractor must provide a completed City "Affidavit (Non-Construction)" for non-construction contracts. Contractor is solely responsible for compliance with any Federal workers' compensation laws such as Jones Act and USL&H Act, including any benefits available to any workers performing work on this project.
- (b) **General Liability.** Commercial General Liability Insurance on an "Occurrence Basis," with limits of liability not less than \$1,000,000/\$2,000,000, for personal injury, bodily injury, and property damage. Coverage shall include: (1) contractual liability, (2) products and completed operations, (3) independent contractors, and (4) property in the care, control, or custody of the Contractor. Extensions shall be added or exclusions deleted to provide the necessary coverage.
- (b) **Automobile Liability.** Minimum limits of \$100,000/\$300,000/\$50,000

**EXHIBIT C – SAMPLE WORK ORDER
WORK ORDER AUTHORIZATION**

Contract Number:_____ **Contract Name:** _____

Work Order Number: _____ **Project Name:**_____

Encumbrance Number: _____

Work Order Amount: _____

To: _____

From: _____, Project Manager

Work Order Manager:

Name: _____
Phone: _____
Email: _____

Description of Work: All work shall be accomplished in accordance with the attached Scope of Work, Exhibit “A” – Scope of Work. Invoices shall reference the Contract Number, Work Order Number and Encumbrance number; include the information required; and be submitted to the Project Manager.

Special note:_____

Commencement Date: Work is authorized to proceed on the date this Work Order is executed by the City.
Commencement of the work authorized herein prior to execution of this Work Order by Contractor constitutes acceptance of all terms and conditions of this Work Order. Payment will not be made until this Work Order has been signed by Contractor and received by the City.

Completion Date: All work pursuant to this Work Order shall be completed by (Completion Date). The Completion Date, if extended pursuant to the above-referenced contract governing this Work Order, shall not be extended beyond the current City fiscal year, ending on September 30, 20__.

Department Director:

Date

Contractor

Date

EXHIBIT D – UNIT PRICE SCHEDULE

Unit Price Schedule				
City of St. Augustine Florida				
Contract PW2020-06				
Sanitary Sewer Cleaning, Inspection and Renewal				
Item	Description	Approximate Qty.	Unit	Unit Cost
Cleaning and Inspection of Sanitary Sewers				
Light Cleaning				
LC1	Lateral Service from Main	5	0 to 40 Ft.	167.50
LC2	Lateral Service from Main	5	≥ 40 Ft.	55.80
LC3	Lateral Service from Cleanout	5	0 to 40 Ft.	167.50
LC4	Lateral Service from Cleanout	5	≥ 40 Ft.	55.80
LC5	6" Diameter	500	LF	3.20
LC6	8 and 10" Diameter	5000	LF	2.40
LC7	12" Diameter	800	LF	3.20
LC8	15" Diameter	100	LF	5.00
LC9	16" Diameter	100	LF	7.10
LC10	18" Diameter	100	LF	8.40
LC11	20" Diameter	50	LF	9.50
Medium Cleaning				
MC1	Lateral Service from Main	5	0 to 40 Ft.	167.50
MC2	Lateral Service from Main	5	≥ 40 Ft.	55.80
MC3	Lateral Service from Cleanout	5	0 to 40 Ft.	167.50
MC4	Lateral Service from Cleanout	5	≥ 40 Ft.	55.80
MC5	6" Diameter	500	LF	3.70
MC6	8" & 10 Diameter	5000	LF	2.90
MC7	12" Diameter	800	LF	3.70
MC8	15" Diameter	100	LF	5.60
MC9	16" Diameter	50	LF	7.70
MC10	18" Diameter	50	LF	9.00
MC11	20" Diameter	50	LF	10.10
Heavy Cleaning				
HC1	Lateral Service from Main	5	0 to 40 Ft.	167.50
HC2	Lateral Service from Main	5	≥ 40 Ft.	55.80
HC3	Lateral Service from Cleanout	5	0 to 40 Ft.	167.50
HC4	Lateral Service from Cleanout	5	≥ 40 Ft.	55.80

HC5	6" Diameter	1000	LF	4.20
HC6	8 and 10" Diameter	6000	LF	3.40
HC7	12" Diameter	2000	LF	4.20
HC8	15" Diameter	100	LF	6.10
HC9	16" Diameter	50	LF	8.20
HC10	18" Diameter	50	LF	9.50
HC11	20" Diameter	50	LF	10.50
Protruding Taps Removal				
CT1	6" Diameter	1	Ea.	390.90
CT2	8" Diameter	50	Ea.	223.40
CT3	10" Diameter	50	Ea.	251.30
CT4	12" Diameter	50	Ea.	279.20
CT5	15" Diameter	1	Ea.	390.90
CT6	16" Diameter	1	Ea.	418.80
CT7	18" Diameter	1	Ea.	446.80
CT8	20" Diameter	1	Ea.	502.60
Root Removal				
RC1	Service Lateral from Main	200	LF	5.60
RC2	Service Lateral from Cleanout	100	LF	5.60
RC3	6" Diameter	300	LF	1.10
RC4	8" Diameter	4000	LF	1.10
RC5	10" Diameter	1000	LF	1.30
RC6	12" Diameter	800	LF	1.40
RC7	15" Diameter	100	LF	2.20
RC8	16" Diameter	50	LF	3.90
RC9	18" Diameter	50	LF	4.20
RC10	20" Diameter	50	LF	5.60
Root Treatment				
RT1	Service Lateral from Main	50	LF	5.60
RT2	Service Lateral from Cleanout	50	LF	5.60
RT3	6" Diameter	300	LF	1.90
RT4	8" Diameter	4000	LF	1.90
RT5	10" Diameter	1000	LF	2.10
RT6	12" Diameter	800	LF	2.30
RT7	15" Diameter	100	LF	3.20
RT8	16" Diameter	50	LF	3.20
RT9	18" Diameter	50	LF	4.50
RT10	20" Diameter	50	LF	5.60

Tuberculation Cleaning				
DS1	Service Lateral from Main	100	LF	16.80
DS2	Service Lateral from Cleanout	100	LF	16.80
DS3	6" Diameter	200	LF	17.90
DS4	8" Diameter	2000	LF	17.90
DS5	10" Diameter	1000	LF	18.40
DS6	12" Diameter	1000	LF	18.70
DS7	15" Diameter	300	LF	24.00
DS8	16" Diameter	50	LF	24.00
DS9	18" Diameter	50	LF	26.20
DS10	20" Diameter	50	LF	30.70
CCTV Inspection				
TV1	Lateral Service from Main	300	0 to 40 Ft.	167.50
TV2	Lateral Service from Main	5	≥ 40 Ft.	55.80
TV3	Lateral Service from Cleanout	50	0 to 40 Ft.	167.50
TV4	Lateral Service from Cleanout	5	≥ 40 Ft.	55.80
TV5	6" Diameter	3000	LF	1.40
TV6	8 and 10" Diameter	10000	LF	1.40
TV7	12" Diameter	1500	LF	1.40
TV8	15" Diameter	100	LF	1.70
TV9	16" Diameter	100	LF	1.70
TV10	18" Diameter	150	LF	2.20
TV11	20" Diameter	50	LF	3.40
General Services				
By-Pass Pumping				
BP1	6" Diameter Main	1	Linear Feet (LF)	\$2.20
BP2	8" Diameter Main	500	LF	\$2.20
BP3	10" Diameter Main	3000	LF	\$2.20
BP4	12" Diameter Main	1000	LF	\$4.50
BP5	15" Diameter Main	100	LF	\$22.30
BP6	16" Diameter Main	100	LF	\$22.30
BP7	18" Diameter Main	100	LF	\$25.70
BP8	20" Diameter Main	50	LF	\$36.90
Plug Installation & Removal (Includes Minimum Weekly Rental) for:				
P1	4" To 8" Diameter Main	20	Weeks	11.20
P2	8" to 16" Diameter Main	20	Weeks	16.80

P3	12" To 24" Diameter Main	20	Weeks	111.70
Sanitary Sewers Renewal				
Sanitary Main CIPP Lining				
L1a	6" Diameter, 4.5mm Nominal thickness with end seals	2000	LF	30.4
L1b	Price for each 1.5mm thickness increase exceeding 4.5mm, 6" dia.	1	LF	5.60
L2a	8" Diameter, 6mm nominal thickness with end seals	5000	LF	24.00
L2b	8" Diameter, 7.5mm nominal thickness with end seals	3000	LF	26.10
L2c	Price for each 1.5mm thickness increase exceeding 7.5mm, 8" dia.	1	LF	2.20
L3a	10" Diameter, 6mm nominal thickness with end seals	4000	LF	28.30
L3b	10" Diameter, 7.5mm nominal thickness with end seals	2000	LF	30.60
L3c	Price for each 1.5mm thickness increase exceeding 7.5mm, 10" dia.	1	LF	2.80
L4a	12" Diameter, 6mm nominal thickness with end seals	2000	LF	31.40
L4b	12" Diameter, 7.5mm nominal thickness with end seals	1000	LF	33.90
L4c	Price for each 1.5mm thickness increase exceeding 7.5mm, 12" dia.	1	LF	3.40
L5a	15" Diameter, 6mm nominal thickness with end seals	300	LF	38.10
L5b	15" Diameter, 7.5mm nominal thickness with end seals	200	LF	51.60
L5c	Price for each 1.5mm thickness increase exceeding 7.5mm, 15" dia.	1	LF	3.90
L6a	16" Diameter, 7.5mm nominal thickness with end seals	200	LF	52.20
L6b	16" Diameter, 9mm nominal thickness with end seals	200	LF	64.30
L6c	Price for each 1.5mm thickness increase exceeding 9mm, 16" dia.	1	LF	4.50
L7a	18" Diameter, 7.5mm nominal thickness with end seals	150	LF	58.70
L7b	18" Diameter, 9mm nominal thickness with end seals	150	LF	67.60

L7c	Price for each 1.5mm thickness increase exceeding 9mm, 18" dia.	1	LF	5.60
L8a	20" Diameter, 10.5mm nominal thickness with end seals	100	LF	91.80
L8b	20" Diameter, 12mm nominal thickness with end seals	100	LF	99.90
L8c	Price for each 1.5mm thickness increase exceeding 12mm, 20" dia.	1	LF	6.70
L9a	8 & 10" Main, 4" Lateral reinstatement	50	Ea.	104.80
L9b	8 & 10" Main, 6" Lateral reinstatement	300	Ea.	104.80
L9c	12" Main, 6" Lateral reinstatement	200	Ea.	104.80
L9d	15" Main, 6" Lateral reinstatement	10	Ea.	250.00
L9e	16" Main, 6" Lateral reinstatement	10	Ea.	250.00
L9f	18" Main, 6" Lateral reinstatement	5	Ea.	300.00
L9g	Cutting and Brushing Lateral Connection, for fold-and-form lined piping.	1	EA	390.9
L10a	6" Pre-Liner Installation	1000	LF	1.50
L10b	8" Pre-Liner Installation	2000	LF	1.90
L10c	10" Pre-Liner Installation	1000	LF	2.40
L10d	12" Pre-Liner Installation	1000	LF	2.60
L10e	15" Pre-Liner Installation	300	LF	2.80
L10f	16" Pre-Liner Installation	200	LF	3.00
L10g	18" Pre-Liner Installation	150	LF	3.20
Sanitary Sewer Service Lateral CIPP Lining				
LL1a	6" diameter, Lateral, One-piece main/lateral connection, nominal 4.5 mm, with a 16" main and lateral insertion not to exceed 20 feet both with end seals.	300	EA	3183.20
LL1b	6" diameter Lateral, one-piece main/lateral connection, price for each additional foot that is inserted into lateral beyond 20 feet.	100	LF	55.80
LL2a	6" diameter lateral lining, 4.5mm nominal thickness with end seals	200	LF	83.80
LL2b	Price for each 1.5 mm thickness increase exceeding .5 mm nominal, 6" diameter	1	LF	27.9
L3a	4" diameter lateral lining, 4mm nominal thickness with end seals	200	LF	83.80

L3b	Price for each 1 mm thickness increase exceeding 4mm nominal, 4" diameter	1	LF	27.90
LL3c	Price for each 1.5 mm thickness increase of the One-piece main/lateral connection (LL1a) exceeding 4.5 mm nominal, 6" dia.	1	EA	111.70
LL4a	4" diameter Lateral, One-piece main/lateral connection, nominal 4 mm, with a 16" main and lateral insertion not to exceed 20 feet both with end seals	100	EA	3183.20
LL4b	Price for each 1 mm thickness increase of the One-piece main/lateral connection (LL4) exceeding 4 mm nominal, 4" diameter	1	EA	111.70
LL5a	6" Diameter Lateral, One-piece main/lateral connection, nominal 4.5mm with Brim Style and Lateral up to 24" both with end seals	1	EA	2457.20
LL5b	4" Diameter Lateral, One-piece main/lateral connection, nominal 4.5mm with a Brim Style and lateral up to 24" both with end seals	1	EA	2457.20
LL6a	6" Diameter Lateral, One-piece main/lateral connection nominal 4.5mm with 16" man and lateral up to 24" both with end seals	1	EA	2457.20
LL6b	4" Diameter Lateral, One-piece main/lateral connection, nominal 4.5mm with 16" main and lateral up to 24" both with end seals	1	EA	2457.20
Sanitary Sewer Sectional CIPP Lining				
SL1	6" Diameter, 4.5mm nominal with end seals typ.			
1a	3 Foot Section	1	EA	2233.80
1b	6 Foot Section	1	EA	2680.60
1c	10 Foot Section	1	EA	2904.00
SL2	8" Diameter, 6mm nominal with end seals typ.			
2a	3 Foot Section	1	EA	2680.60

2b	6 Foot Section	1	EA	3015.70
2c	10 Foot Section	1	EA	3350.70
SL3	10" Diameter, 6mm nominal with end seals typ.			
3a	3 Foot Section	1	EA	2904.00
3b	6 Foot Section	1	EA	3239.00
3c	10 Foot Section	1	EA	3574.10
SL4	12" Diameter Sewer, 6mm nominal with end seals typ.			
4a	3 Foot Section	1	EA	3574.10
4b	6 Foot Section	1	EA	4244.30
4c	10 Foot Section	1	EA	4691.00
4x	Price for each 1.5mm thickness increase exceeding 6mm	1	EA	837.70
SL5	15" Diameter, 7.5mm nominal with end seals typ.			
5a	3 Foot Section	1	EA	4132.60
5b	6 Foot Section	1	EA	4691.00
5c	10 Foot Section	1	EA	5249.50
5x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	949.40
SL6	16" Diameter, 7.5mm nominal with end seals typ.			
6a	3 Foot Section	1	EA	4244.30
6b	6 Foot Section	1	EA	4802.70
6c	10 Foot Section	1	EA	5361.20
6x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	949.40
SL7	18" Diameter, 7.5mm nominal with end seals typ.			
7a	4 Foot Section	1	EA	5584.60
7b	8 Foot Section	1	EA	6366.4
7c	10 Foot Section	1	EA	7148.20
7x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	1340.30

SL8	20" Diameter, 10.5mm nominal with end seals typ.			
8a	4 Foot Section	1	EA	6701.50
8b	8 Foot Section	1	EA	7818.40
8c	10 Foot Section	1	EA	8935.30
8x	Price for each 1.5mm thickness increase exceeding 10.5mm	1	EA	1675.40
Sanitary Sewer Main and Lateral Connection Sealing by Chemical Grout				
GS1	Grout seal Main/Lateral Connection	1	EA	325.00
GS2	6" Diameter Main Pipe Joint, fracture or break	1	EA	27.90
GS3	8" Diameter Main Pipe Joint, fracture or break	1	EA	33.50
GS4	10" Diameter Main Pipe Joint, fracture or break	1	EA	39.10
GS5	12" Diameter Main Pipe Joint, fracture or break	1	EA	50.30
GS6	15" Diameter Main Pipe Joint, fracture or break	1	EA	55.80
GS7	16" Diameter Main Pipe Joint, fracture or break	1	EA	61.40
GS8	18" Diameter Main Pipe Joint, fracture or break	1	EA	72.60
GS9	20" Diameter Main Pipe Joint, fracture or break	1	EA	78.20
GS10	Grout > Initial 2 Gal./Joint, fracture or break	1	Gallon	17.90
Sanitary Sewer Cleanout				
LCO1	Lateral Cleanout Detail SS-19, 20, 21, and 25 Includes Fernco Ultra-Rib Coupling with Stainless Steel Bands (0 to 3 VLF) 4" service to 6" cleanout.	1	EA	1340.30
LCO2	Lateral Cleanout price beyond > 3 VLF Depth	1	EA Added VLF	418.80
Sidewalk				
SW1	Remove and Replace Sidewalk Section, 4" Thick, Matching existing width. Detail PD-07A. (3000 psi concrete)	1	Sq. Ft.	53.60

SW2	Same as SW1 except use detail PD-07B, Side Walk Adjacent to Curb.	1	Sq. Ft.	76.00
SW3	Same as SW1 except use detail PD-07D, monolithic curb/sidewalk.	1	Sq. Ft.	86.00
SW4	Same as SW1 except cast with Coquina mix.	1	Sq. Ft.	113.90
SW5	Same as SW2 except cast from Coquina Mix.	1	Sq. Ft.	136.30
SW6	Same as SW3 except cast from Coquina Mix.	1	Sq. Ft.	160.80
Maintenance of Traffic (St. Johns County & FDOT)				
TM1	Traffic Control – MOT Index 601 or 602	1	Day	446.80
TM2	Traffic Control – MOT Index 603	1	Day	670.10
TM3	Traffic Control – MOT Index 604 or higher	1	Day	893.50
TM4	Traffic Control – MOT Index 601 or 602	1	Week	2233.80
TM5	Traffic Control – MOT Index 603	1	Week	3350.70
TM6	Traffic Control – MOT Index 604 or higher	1	Week	4467.70
TM7	Flagman	1	Each Day	692.50
TM8	Variable Message Board (per week)	1	Week	2233.80
Testing				
TS1	Grout Performance Demo Test	2	EA.	275.00
TS2	Main Jt. Test	20	EA.	55.80
TS3	Lateral connection Test	20	EA.	275.00
TS4	CIPP cure water test	1	EA.	1116.90
TS5	CIPP Liner Test	3	EA.	279.20
24 Hr. Emergency Services (3 Hr. Response Window)				
E1	Video Truck with work crew, Weekdays	1	Hourly Rate	279.20
E2	Video Truck with work crew, Holidays and Weekends	1	Hourly Rate	363.00
E3	Mobilization of Vector and Video Truck	1	LS	558.50
E4	Vector and Video Equipment Trucks with work crew, Weekdays	1	Hourly Rate	474.70
Mobilization				

M1	Mobilization for 20 work day period	1	Each	4746.90
M2	Mobilization for work periods 20 to 40 work day period	1	Each	3630.00
M3	Mobilization for work periods greater than 40 work days.	1	Each	1955.70
M4	Emergency Mobilization Less than 1 week	1	Each	5863.80
Bond				
B	Contract Performance and Payment Bond Cost Not to Exceed 2%	NA	Ea.	1.5%
Warranty Inspections				
WI1a	Warranty Inspection 6" Lateral from main	1	LF	16.80
WI1b	Warranty Inspection 6" Lateral from cleanout	1	LF	11.20
WI2	Warranty Inspection 8 & 10" Main	1	LF	2.50
WI3	Warranty Inspection 12" Main	1	LF	3.00
WI4	Warranty Inspection 15" Main	1	LF	3.30
WI5	Warranty Inspection 16" Main	1	LF	3.90
WI6	Warranty Inspection 18" Main	1	LF	4.70
WI7	Warranty Inspection 20" Main	1	LF	6.10
WI8	Warranty Inspection Mobilization	1	EA.	5500.00
Stormwater System				
Item	Description	Annual Est. Qty.	Unit	Unit Cost
Clean and Inspection of Storm Water Mains				
Light Cleaning & Inspection				
A1	8" Diameter	1	LF	\$3.90
A2	10" Diameter	1	LF	\$4.00
A3	12" Diameter	1	LF	\$4.40
A4	15" Diameter	1	LF	\$5.10
A5	18" Diameter	1	LF	\$6.20
A6	21" Diameter	1	LF	\$7.20
A7	24" Diameter	1	LF	\$8.40
A8	30" Diameter	1	LF	\$11.60
A9	36" Diameter	1	LF	\$13.10
A10	42" Diameter	1	LF	\$17.50

A11	48" Diameter	1	LF	\$21.80
A12	54" Diameter	1	LF	\$36.40
A13	60" Diameter	1	LF	\$43.60
Medium Cleaning& Inspection				
A14	8" Diameter	1	LF	\$4.10
A15	10" Diameter	1	LF	\$4.30
A16	12" Diameter	1	LF	\$4.70
A17	15" Diameter	1	LF	\$5.40
A18	18" Diameter	1	LF	\$6.50
A19	21" Diameter	1	LF	\$7.60
A20	24" Diameter	1	LF	\$9.50
A21	30" Diameter	1	LF	\$13.00
A22	36" Diameter	1	LF	\$14.50
A23	42" Diameter	1	LF	\$20.40
A24	48" Diameter	1	LF	\$27.60
A25	54" Diameter	1	LF	\$40.70
A26	60" Diameter	1	LF	\$50.90
Heavy Cleaning & Inspection				
A27	8" Diameter	1	LF	\$4.40
A28	10" Diameter	1	LF	\$4.60
A29	12" Diameter	1	LF	\$5.10
A30	15" Diameter	1	LF	\$6.20
A40	18" Diameter	1	LF	\$7.10
A41	21" Diameter	1	LF	\$8.70
A42	24" Diameter	1	LF	\$10.90
A43	30" Diameter	1	LF	\$13.80
A44	36" Diameter	1	LF	\$17.50
A45	42" Diameter	1	LF	\$24.70
A46	48" Diameter	1	LF	\$33.40
A47	54" Diameter	1	LF	\$50.90
A48	60" Diameter	1	LF	\$61.10
Outfall and Headwall Barnacle/Oyster Cleaning				
A49	8" Diameter	1	Each	\$195.50
A50	10" Diameter	1	Each	\$206.60
A51	12" Diameter	1	Each	\$217.80
A52	15" Diameter	1	Each	\$223.40
A53	18" Diameter	1	Each	\$229.00
A54	21" Diameter	1	Each	\$251.30

A55	24" Diameter	1	Each	\$262.50
A56	30" Diameter	1	Each	\$279.20
A57	36" Diameter	1	Each	\$335.10
A58	42" Diameter	1	Each	\$385.30
A59	48" Diameter	1	Each	\$474.70
A60	54" Diameter	1	Each	\$558.50
A61	60" Diameter	1	Each	\$670.10
Stormwater Sectional CIPP Liner				
A62	8" Diameter, 6.0 mm finished thickness	1	LF	\$893.53
A63	8" each additional 1.5 mm thickness	1	LF	\$27.90
A64	10" Diameter 6.0 mm finished thickness	1	LF	\$968.00
A65	10" each additional 1.5 mm thickness	1	LF	\$33.50
A66	12" Diameter 6.0 mm finished thickness	1	LF	\$1,191.00
A67	12" each additional 1.5 mm thickness	1	LF	\$83.70
A68	15" Diameter 6.0 mm finished thickness	1	LF	\$1,377.33
A69	15" each additional 1.5 mm thickness	1	LF	\$94.94
A70	18" Diameter 7.5 mm finished thickness	1	LF	\$1,661.53
A71	18" each additional 1.5 mm thickness	1	LF	\$134.03
A72	21" Diameter 7.5 mm finished thickness	1	LF	\$1,998.79
A73	21" each additional 1.5 mm thickness	1	LF	\$167.50
A74	24" Diameter 9.0 mm finished thickness	1	LF	\$2,281.90
A75	24" each additional 1.5 mm thickness	1	LF	\$193.80
A76	30" Diameter 9.0 mm finished thickness	1	LF	NO BID
A77	30" each additional 1.5 mm thickness	1	LF	NO BID
A78	36" Diameter 10.5 mm finished thickness	1	LF	NO BID
A79	36" each additional 1.5 mm thickness	1	LF	NO BID
A80	42" Diameter 10.5 mm finished thickness	1	LF	NO BID
A81	42" each additional 1.5 mm thickness	1	LF	NO BID
A82	48" Diameter 10.5 mm finished thickness	1	LF	NO BID
A83	48" each additional 1.5 mm thickness	1	LF	NO BID

A84	54" Diameter 13.5 mm finished thickness	1	LF	NO BID
A85	54" each additional 1.5 mm thickness	1	LF	NO BID
A86	60" Diameter 13.5 mm finished thickness	1	LF	NO BID
A87	60" each additional 1.5 mm thickness	1	LF	NO BID
Plug Installation & Removal				
A88	24" to 42" Diameter	1	Each Day	\$1,005.20
A89	48" to 72" Diameter	1	Each Day	\$1,340.30
Stormwater Sewer CIPP Lining				
	8" Diameter, 6mm nominal thickness		LF	\$56.90
	8" each additional 1.5 mm thickness		LF	\$1.70
	10" Diameter, 6mm nominal thickness		LF	\$65.20
	10" each additional 1.5 mm thickness		LF	\$2.20
	12" Diameter, 7.5mm nominal thickness		LF	\$71.80
	12" each additional 1.5 mm thickness		LF	\$2.80
	15" Diameter, 9 mm nominal thickness		LF	\$109.30
	15" each additional 1.5 mm thickness		LF	\$3.40
	16" Diameter, 9 mm nominal thickness		LF	\$117.80
	16" each additional 1.5 mm thickness		LF	\$3.90
	18" Diameter, 10.5 mm nominal thickness		LF	\$127.50
	18" each additional 1.5 mm thickness		LF	\$4.50
	20" Diameter, 10.5mm nominal thickness		LF	\$137.70
	20" each additional 1.5 mm thickness		LF	\$5.00
	21" Diameter, 10.5mm nominal thickness		LF	\$177.40
	21" each additional 1.5 mm thickness		LF	\$5.60
	24" Diameter, 12 mm nominal thickness		LF	\$208.50
	24" each additional 1.5 mm thickness		LF	\$6.10
	27" Diameter, 12 mm nominal thickness		LF	\$216.30
	27" each additional 1.5 mm thickness		LF	\$6.70

	30" Diameter, 13.5 mm nominal thickness		LF	\$238.60
	30" each additional 1.5 mm thickness		LF	\$7.30
	36" Diameter, 15 mm nominal thickness		LF	\$293.50
	36" each additional 1.5 mm thickness		LF	\$7.80
	42" Diameter, 16.5 mm nominal thickness		LF	\$335.10
	42" each additional 1.5 mm thickness		LF	\$8.40
	48" Diameter, 18 mm nominal thickness		LF	\$390.30
	48" each additional 1.5 mm thickness		LF	\$8.90
	54" Diameter, 21 mm nominal thickness		LF	\$506.20
	54" each additional 1.5 mm thickness		LF	\$9.50
	60" Diameter, 24 mm nominal thickness		LF	\$613.20
	60" each additional 1.5 mm thickness		LF	\$10.10

CONFORMED 09-15-2020

ATTACHMENT #1
PROTECTION OF ARCHAEOLOGICAL AND HISTORICAL SITES

Where historical remains, antiquity or any other object of cultural or archaeological importance are discovered during construction the following procedures shall be applied:

- 1) Stop construction activities;
- 2) Delineate the discovered site area;
- 3) Secure the site to prevent any damage or loss of removable objects;
- 4) Notify the City Archaeologist within one (1) business day who in turn shall notify the responsible authorities of the State if necessary.
- 5) The City Archaeologist is responsible for protecting and preserving the site before deciding on the proper procedures to be carried out;
- 6) An evaluation of the finding will be performed by the City Archaeologist where the significance and importance of the findings will be assessed according to various criteria relevant to cultural heritage including aesthetic, historic, scientific or research, social and economic values;
- 7) Decision on how to handle the findings will be reached based on the above assessment and could include changes in the project layout, conservation, preservation, restoration or salvage; and
- 8) Construction work may resume only when permission is given from the City Archaeologist or the responsible authorities of the State (if necessary).

In case of delay incurred in direct relation to the Archaeological findings not stipulated in the contract (and affecting the overall schedule of works), the Contractor may apply for an extension of time. However, the Contractor will not be entitled for any kind of compensation or claim other than what is directly related to the execution of the archaeological findings, works and protections.

ATTACHMENT #2 – UNEXPECTED DISCOVERIES

A. General Procedures

The Selected Contractor shall notify the City within one (1) business day if it appears that the project will affect a previously unidentified property which may be an historic property, including human remains, or affect a known historic property in an unanticipated manner.

If any archaeological deposits are identified that contain human remains the City Archaeologist shall notify the State Historic Preservation Officer (SHPO). The Selected Contractor shall ensure work immediately stops in the vicinity of such a discovery and will take all reasonable measures to avoid, minimize harm and protect the discovery until the City Archaeologist concludes the consultation with all appropriate parties. For non-human remain discoveries, decisions will be determined by City Archaeologist for other significant archaeological deposits (e.g., trash pits, wells, building remnants, etc.).

If human remains are discovered, the City Archaeologist shall inform SHPO who will then notify the parties of any time constraints and all parties will mutually agree upon timeframes for consultation on the discovery. Following consultation, SHPO will provide all consulting parties with written recommendations which take into account the effects of the undertaking. If the consulting parties do not object to SHPO's recommendations for the treatment of the discovery within the agreed upon timeframe, SHPO will require the City to modify the project scope of work to implement SHPO's recommended action. If there is a timely objection to SHPO's recommended action, SHPO will consult further with the objecting party.

B. Human Remains

If human remains are discovered during construction, all project construction activities shall cease immediately. The City shall notify the local Police Department and the Medical Examiner's Office via telephone within one (1) business hour of the stop work and SHPO via email within one (1) business day. Construction activities shall not resume until the disposition of the human remains has been resolved in accordance with all applicable local, state and Federal laws.

1. If the human remains are determined by the Medical Examiner's Office to be of recent, non-Native American origin, then the City shall ensure that the remains are removed and the discovery area is treated in accordance with all applicable local, state and Federal Laws. Construction may resume upon notification from the City.
2. If the human remains are of archaeological interest or Native American, SHPO shall take the lead in working with all parties to ensure compliance with the applicable local, state and Federal laws. Construction may resume upon notification from SHPO to the City.
 - a. SHPO shall follow policy presented in the Advisory Council on Historic Preservation (ACHP)'s *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects* (February 23, 2007).
 - b. SHPO will conduct an in-person meeting in St. Augustine with representatives of the appropriate Indian Tribes, ACHP and other consulting parties as needed to determine the disposition of the remains. This meeting will include a site visit if requested by any Indian Tribe, SHPO or ACHP.

SECTION 02959

SEWER MAIN AND LATERAL CONNECTION SEALING BY CHEMICAL GROUT

PART 1 GENERAL

1.01 DESCRIPTION

- H. Section includes requirements for rehabilitation of defective mainline joints, circumferential mainline cracks, other small mainline defects and defective lateral-mainline interfaces by application of chemical grout material.
- I. Provide all labor, materials, tools, equipment and incidentals as shown, specified, and required for testing sewer pipe joints by applying a positive air pressure to the joints, monitoring and recording the pressure in the void. The intent of joint & connection testing is to identify those sewer joints, lateral connections and laterals that are not watertight and that can be successfully sealed by packer injection grouting. This document can be utilized for the following applications:
 - 1. Test all joints in a mainline segment
 - 2. Test all service lateral connections from the sewer main to a predetermined distance up the sewer lateral.
 - 3. Test all joints within a predetermined distance in laterals directly connected to man-holes.
- J. Provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to grout pipeline joints, joints in laterals connected to manholes and lateral connections to the mains using the packer injection method.
 - 1. Packer injection grouting is used to reduce the infiltration within the pipeline, seal annular space between liners and host pipes at lateral connections, seal pipe joints that have failed the joint test criteria, provide external pipe support, but not a structural rehabilitation, by stabilizing soils outside the pipe and prevent further loss of pipe bedding into the pipe.
 - 2. Packer injection grouting shall be accomplished by pressure injection of chemical grout into the soils encompassing the exterior of pipe joint. Chemical grouts shall be designed to be injected into the soil surrounding the pipe, which stabilizes the soil and forms a permanent impermeable seal called a grout/soil ring, and into the annular space between liners and host pipes. Adequate volumes of grout must be injected to form an effective seal. Adequate amounts of grout are based generally upon pipe size and field conditions. This application will be through structurally sound joints and lateral connections through penetrations from within the pipe by using the packer method in tandem with a closed-circuit television (CCTV) inspection system.
- K. All contractors and employees' vehicles on the project site for the City shall clearly and boldly display their full name, address, and phone number.

L. Maintenance of Traffic (MOT)

Refer to General Requirements Section 01570, Maintenance of Traffic requirements.

M. All contractors and employees' vehicles on the project site for the City shall clearly and boldly display their full name, address and phone number.

1.02 DEFINITIONS

A. Mainline: Sewer Main.

B. Lateral: Service pipe from property line to mainline.

C. Lateral-Mainline Interface: Lateral connection to mainline.

N. Lateral-Mainline Interface Seal: Watertight seal between lateral and mainline.

1.03 QUALITY ASSURANCE REQUIREMENTS

D. Follow:

1. ASTM F2304 Standard Practice for Rehabilitations of Sewers using Chemical Grouting, latest revision.
2. ASTM F2454 Standard Practice for Sealing Lateral Connections and lines from the Mainline Sewer Systems by Lateral Packer Method, Using Chemical Grouting, latest revision.

E. Commercially Proven Products:

8. Minimum 12,000 mainline joints and 1,000 lateral-mainline interfaces successfully grouted and documented in the United States and Internationally.
9. Translate international installations into English to Engineers approval.

F. Personnel involved in sealing of joints and lateral connections: Certified by grout manufacturer they have successfully completed training in handling, mixing and application of grout for sanitary sewer line, joint and lateral connection sealing.

2. Refer to Section 01001 General Work Requirements paragraph 1.02.E for grouting qualification requirements.

- E. Third-Party Inspector: Minimum of 5 years' experience in Chemical grouting applications and have no financial or directorial link to grout manufacturer or Contractor.
- F. Engineer may inspect and test grout at factory, before delivery to site, while in storage, or prior to use.
- G. Internally CCTV inspect host pipe prior to grouting, during grouting and post grouting.

1.04 SUBMITTALS

- B. Submit following Section 01300.
 - 2. Catalog data showing manufacturer's clarifications and updates, ASTM references, material composition, specifications, and physical and chemical properties of grout.
 - c. Chemical Grout Information:
 - 5) Description of chemical grout materials.
 - 6) Description of proposed additives to be used.
 - 7) Manufacturers recommended procedures for storing, mixing, testing, and handling of chemical grouts.
 - 8) SDS sheets for all materials to be used.
 - d. Identify the manufactures & models of the packers to be utilized on the project.
 - 10. Calculations of expected volumes of annular space between packer and pipe wall, to be used in calculating required gel times.
 - 3. Manufacturer's recommended procedures for handling, storing, mixing and injecting grout.
 - 4. Method of Construction.
 - g. Access manholes and site locations.
 - h. Work dimensions.
 - i. Size of working area.
 - j. Impacted portions of existing sewer.
 - k. Site access points.
 - l. Bypass pumping plan: Following Section 01516.
 - 5. Emergency plan detailing procedures to be followed in event of health and safety emergency, pump failures, sewer overflows, service backups, and sewage spillage. Maintain copy on site for duration of project.
 - d. Address dangers associated with sewer rehabilitation work.
 - e. Identify Health and Safety officer. (i.e. crew chief)
 - f. Designated Health and Safety officer:
 - 4) Responsible for providing health and safety oversight of personnel participating on project team.
 - 5) Perform and document routine work area inspections, conduct safety meetings, and provide safety orientations for team members.
 - 6) Have in easily accessible location, the following contact information

- d) Non-emergency number.
- e) Contractor's health and safety representative name and number.
- f) Occupational health clinic number(s).
- d. Submit for review the following;
 - 3) List of critical rehabilitation equipment, to be inspected on daily basis.
 - 4) Recently completed (previous month) monthly maintenance log.

B. Submit following Section 01300.

- 1. Grout manufacturer's certification that Contractor is approved installer of their system. Certificates of training in handling, mixing, and application of grout for sanitary sewer line and joint and lateral connection sealing for grout truck operator and at least one crewmember involved in sealing process.
- 2. Third party lab test results for field installations in United States of same grout system as proposed for actual installation.
 - a. Test results must verify grout physical and chemical properties specified herein have been achieved in previous field applications.
- 11. CCTV inspection reports and electronic downloads following 02762 and 02763 before and following sewer joint sealing. Furnish original copies of CCTV inspections color DVDs to Engineer within 10 days.
- 12. Documentation for Products and Installers: Engineer's approval required before acceptance or injection of grout.
- 13. Proof of grout manufacturer's product liability insurance, if requested by Engineer.
- 14. Pump calibration information.
- 15. Field sealing records.
- 16. Certification of accuracy and calibration of pressure sensing/monitoring equipment by independent testing firm within one month before use of equipment.
- 17. Upon completion of each pipe segment, submit a report showing the following data for each joint and/or lateral connection tested, grouted or attempted to be grouted in accordance with NASSCO PACP.
 - a. Identification of the sewer pipe section tested by assigned sewer ID (if available) and length.
 - b. Type of pipe material, diameter & depth of pipe to the surface at manholes.
 - c. Length of pipe sections between joints.
 - d. Test pressure used and duration of test.
 - e. Pass/fail results for each joint/connection tested.
 - f. Location stationing of each joint/connection tested, and location of any joints/connections not tested with an explanation for not testing.
 - g. Volume of grout material used on each joint or connection.
 - h. Gel set time used (cup test results from tanks)

- i. Grout mix record of the batches mixed including amount of grout and catalyst, additives, temperature of the grout solution in tanks.
- j. Operator conducting testing and sealing shall be noted on the reports.
- k. Video recordings
 - 3) Video recording shall include testing and sealing operations for each joint/lateral (including inflation and deflation over the joint/lateral) displaying the final air test of joints or laterals.
 - 4) Additional final recording, if specified, shall include inspection of the pipe or lateral after all grouting work is complete.

1.05 DELIVERY, STORAGE, AND HANDLING

- B. Protect, store, and handle grout or other material during transportation and delivery, while stored on-site, and during installation following manufacturer's recommendations.
- B. Grout Material found defective or damaged due to manufacture or shipment:
 - 8. Remove from Contract site and replace, following Engineer's direction, at no cost to the Commission.

PART 2 - PRODUCTS

2.01 TESTING EQUIPMENT & GROUTING EQUIPMENT

- I. The basic equipment used for mainline pipe joints and for laterals connected to the mainline shall consist of a remotely operated color television camera capable of pan and tilt, joint testing device (referred to hereafter as a packer), and test monitoring equipment. The equipment shall be constructed in such a way as to provide means for introducing air under pressure into the void area created by the expanded ends of the packer against the host pipe and a means for continuously measuring, viewing and recording the actual static pressure of the test medium and grout within the void area only. The packer shall be of a size less than the diameter of the host pipe, with the cables at either end used to pull it through the line and may always be constructed in such a manner as to allow a restricted amount of sewage to flow. Packer shall be expanded by air pressure. Packers shall be of low void space construction with void volume given by the packer manufacturer.
- J. The device for testing lateral connections shall consist of inflatable mainline end elements and a lateral grouting plug that creates a void area extending beyond the main connection. Whenever possible, use a lateral grouting plug sized to match the diameter of the lateral being grouted with an effective sealing length of at least PREDETERMINED DISTANCE BY ENGINEER. Where the lateral is capped, utilize alternate lateral grouting plug or equipment sized appropriately for the capped lateral. In cases where the lateral

transitions from 6" to 4" in diameter, use a 4" lateral grouting plug. However, it is possible that due to physical restrictions the lateral plug may not launch and thus the service may not be able to be grouted.

- K. The basic equipment for 4-inch and 6-inch laterals connected to manholes shall consist of a flexible push-type packer and mini-push camera. The device for testing lateral pipe connected to the manhole shall be capable of testing the joints within PREDETERMINED DISTANCE BY CITY of the lateral or to the cleanout, whichever comes first, from the manhole toward the building. If the lateral contains a transition, CONTRACTOR may change out diameters of push packer or grout lateral using only a 4-inch push packer.
- L. Void pressure data shall be transmitted from the void area to the monitoring equipment or video picture of a pressure gauge mounted on the packer and connected to the void area. All test monitoring shall be above ground and, in a location, to allow for simultaneous and continuous observation of the televising monitor and test monitoring equipment.
- M. Grouting equipment shall consist of the packer, appropriate pumping and hosing systems capable of supplying an uninterrupted flow of sealing materials to completely fill the voids. Grout pumping system shall be sized to deliver a mixed volume of grout at a minimum of 3 gpm and 30 gallons of uninterrupted flow within 10 minutes.
- N. Volume of mixed grout pumped must be capable of being measured and recorded for each grouted joint/connection. Generally, the equipment shall be capable of performing the specified operations in sewers where flows do not exceed 25 percent of pipe diameter unless permitted by CITY.
- O. Connection and lateral service sealing shall be accomplished using the lateral grouting plugs and push packers specified above. Always provide back-up bladders for each packer on-site during grouting procedures.
- P. Equipment for cleaning lateral blockages shall be readily available while any lateral grouting work is being performed.

2.2 MATERIALS

- B. Grouts - General
 - 2. While being injected, the grout must be able to react /perform in the presence of water (groundwater).
 - 3. The ability to increase grout mix viscosity, density and gel strength by increased concentration of constituents or the use of approved additives.
 - 10. The cured grout must withstand submergence in water without degradation.
 - 11. The resultant grout formation must be homogeneous and prevent the passage of water (infiltration) through the pipe joint.
 - 12. The grout must not be biodegradable.

13. The cured grout should be chemically stable and resistant to organics found in sewage.
14. Residual grout shall be easily removable from the sewer line to prevent blockage of the sewage flow.
 - b. Handle, mix, and store grout in accordance with the manufacturer's recommendations. The materials shall be delivered to the site in unopened original manufacturer's containers.

D. Grouting.

1. Properties and Characteristics.

- a. Will perform in presence of infiltrating water (groundwater), during injection.
- b. Packaged for field storage, handling requirements with minimum spillage and worker safety.

2. Cured grout:

- a. Submergible in water without degrading.
- b. Not biodegradable.
 - 1) Additives may be used to meet this requirement, without effecting long-term strength.
- d. Chemically stable and resistant to concentrations of acids, alkalis, and organic materials found in normal sewage.

3. Composition.

a. Acrylamide gel:

- 3) Minimum of 10 percent acrylamide base material by weight in total grout mix.
- 4) Higher concentration percent of acrylamide base material (maximum 20%) may be used to increase strength or offset dilution during injection.
- 4) Able to tolerate some dilution and react in moving water during injection.
- 5) Approximately 2 centipoise viscosity. Can be increased with additives.
- 6) Constant viscosity during reaction period.
- 7) Controlled reaction time from 10 seconds to 1 hour.
- 8) Curing reaction producing a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
- 9) Able to prevent dehydration and increase-mix viscosity, density and gel strength by use of additives.
 - c) Diatomaceous earth (Celite 209 or equal) can be added to concentration of five percent.
 - d) Use of other additives following manufacturer's recommendation and Engineer's approval.
- 10) Root control additive 2, 6-Dichlorobenzonitrile, may be added following manufacturer's recommendation and Engineer's direction.

b. Urethane gel:

- 1) Ratio: One-part urethane prepolymer mixed with 5 to 10 parts water by volume.
 - e) Recommended mix ratio: 1-part urethane prepolymer to 8 parts of water (11 percent prepolymer).
- 2) Liquid prepolymer:
 - b) Solids content: 77 to 83 percent.

- f) Specific Gravity: 1.04 (8.65 pounds per gallon)
 - g) Flash Point: 20 degrees F.
 - h) Viscosity: 600 to 1,200 centipoises water at 70 degrees F.
- 3) Water for reacting prepolymer: pH of 6.5 to 8.
- 4) Curing reaction:
 - d) Produces chemically stable, non-biodegradable, tough, flexible gel.
 - e) Able to increase mix viscosity, density, gel strength and resistance to shrinkage by using additives in water component of grout.
 - f) Minimum 15 percent shrink control agent supplied by the same manufacturer.
- c. Acrylate gel:
 - 5) Minimum 10 percent acrylate base material by weight or as specified by the manufacturer.
 - c) In total grout mix, a higher concentration (percent) of acrylate base material may be used to increase strength or offset dilution during injection.
 - d) If acrylate base material is in 40 percent solution 27.5 percent by weight of total grout mix: 11 percent base material.
 - 6) Able to tolerate some dilution and react in moving water during injection.
 - 7) Viscosity: Approximately 2 centipoises.
 - c) Can be increased with additives.
 - 8) Constant viscosity during reaction period.
 - 6) Controlled reaction time: 10 seconds to 1 hour.
 - 8) Curing reaction producing homogeneous, chemically stable, non-biodegradable, flexible gel.
 - 9) Able to prevent dehydration and to increase-mix viscosity, density and gel strength by use of additives.
 - b) Diatomaceous earth (Celite 209 or equal) can be added to concentration of five percent, by volume.
 - d) Use of other additives following manufacturer's recommendations and Engineer's approval.
 - 9) Root control additive 2, 6-Dichlorobenzonitrile, may be added following manufacturer's recommendation and Engineer's direction.

E. Additives

- 2. At the CONTRACTOR'S discretion and according to field conditions, additives may be selected and used within the manufacturers recommended quantities.
- 9. Strengthening Agents
 - b. For joint grouting, a latex or "diatomaceous earth" additive may be added to increase compressive and tensile strength. The quantity of strengthening agent additive shall be as recommended by the manufacturer and approved by ENGINEER.

Product Manufacturer:

10. Root Inhibitor

- b. When roots are present, for joint and lateral connection joint grouting, a root deterrent chemical shall be added to control root re-growth. The quantity of inhibitor shall be as recommended by the manufacturer and approved by ENGINEER.
- 11. Dye - A manufacturer approved water soluble dye without trace metals may be added to the grout tank(s) for visual confirmation.
- 12. Gel Time Modifier - A gel time extending agent may be used in accordance with the manufacturer's recommendations to extend gel time as necessary.
- 13. Freeze/Thaw - In those lines where the grouting material may be exposed to a freeze-thaw cycle, ethylene glycol or other ENGINEER approved additive shall be used to prevent chemical grout cracking once set.
- 14. When using non soluble additives the grout tanks must have mechanical mixing devices to keep the additives in suspension and maintain a uniform solution of grout and additive.

2.2 EQUIPMENT

A. General.

- 1. CCTV system, necessary chemical grout containers, pumps, regulators, valves, hoses, joint sealing packers for various sizes of sewer pipes, and lateral bladders.
- 2. Air pressure monitoring system:
 - a. Configured with no valves on air line between measuring point and pressure sensing device.
 - b. Digital readouts located at control panel in grouting truck.

B. Grouting packer:

- 1. Diameter less than pipe size, with cables attached at each end to pull it through the line.
- 2. Designed to allow restricted amount of sewage to flow through device, in mainlines where sewage flows do not exceed maximum depth for joint testing/sealing following manufacturer's recommendation and following ASTM F2304 and ASTM F2454.
- 3. Approved Manufacturers:
 - a. Logiball, Inc.
 - b. Cues, Inc.
 - c. Or Equal.

PART 3 - EXECUTION

3.1 PUBLIC NOTIFICATION

- B. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained that the business is open. No

sewage from the services or main line shall be discharged on the ground or in waterways.

3.2 PREPARATION

A. Access.

2. Chemical grout sealing of mainline sewers: Through existing manholes.
5. Chemical grout sealing of lateral-mainline connections: Through mainline sewers.

B. Sewer Cleaning and Surface Preparation.

1. Cleaning of Main Line Sewers and Laterals.
 - a. Hydraulic high-pressure jetting of reaches is permitted.
 - c. Before sealing work, lightly clean each line section.
 - d. Remove sludge, dirt, sand, grease, root, and other materials from pipe and collect and remove resulting debris from downstream manhole of sewer section being cleaned.
 - b. Collect debris and remove from site. Following jurisdictional requirements and Engineers' approval.
 - f. Sewers damaged as result of improper use of cleaning equipment: Promptly repaired at no additional cost to the Commission.
2. Clean sewer main within 72 hours before chemical grouting of sewer lateral connections.

C. Pre-sealing CCTV Inspection.

6. After cleaning, perform CCTV inspection to ensure main is sufficiently clean to perform sealing operations. Document protruding taps and structural defects found during the CCTV inspection.
 - c. If Engineer finds main is not sufficiently cleaned, remove CCTV and sealing equipment and re-clean at no additional cost to the Commission.
 - d. If light cleaning is not sufficient, heavy clean sewer following Section 02761.

D. Pre-sealing Reaming.

2. Ream or trim protruding taps following Section 02766.

G. Bypass Pumping: Before pre-sealing CCTV inspection, and joint testing and sealing can be performed, depth of flow should be at or below levels shown in table.


2. If necessary, bypass pump to bring flow levels down to acceptable levels.

Pipe Diameter (inches)	Maximum Depth of Flow (as % of Pipe Diameter)
6 to 10	20
12 to 24	25
27 or greater	30


- H. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.
- I. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

3.3 TESTING

A. Performance Test Demonstrations.


- 2. Before start of work, verify accuracy and repeatability of void pressure meter and fluid pumping equipment.
- 3. If test demonstrations fail to show accuracy of +/-0.5 psi for void pressure repeatability and +/- 0.1 gallon of chemical pumped into measured container or bucket, make required repairs or adjustments to equipment and gauges and retest until results meet Engineers satisfaction.
- 8. Test may be required at commencement of each work shift during sealing operations.
- 9. Perform demonstration testing may be performed each day of grouting. This testing may be waved by the City. 06-08-2020 Conformed 

B. Mainline Joint Pressure Air Testing.

- 2. Before testing, perform control tests at ground surface to verify accuracy, integrity, and reliability of testing equipment following ASTM F2304.
- 7. After entering each pipe segment through manhole, and immediately before joint pressure air testing, perform an intermediate test on pipe between joints following ASTM F2454.
- 8. Maintain joint testing air pressure of 3 psi higher than groundwater pressure outside the pipe, up to maximum of 10 psi. If groundwater pressure data is not available, use joint testing pressure of 0.5 psi per vertical foot of pipe depth or 10 psi, whichever is greater.
- 9. Perform testing following ASTM F2304. Seal joints that do not maintain void pressure drop of less than 1 psi in 15 seconds.
- 10. When the joints are longitudinally cracked, fractured or broken testing will not be required. 06-08-2020 Confirmed 

C. Lateral Connection Pressure Air Testing.

- 2. Before lateral connection testing, perform control tests at ground surface to verify accuracy, integrity and reliability of testing equipment following ASTM F2454.
- 3. Maintain joint testing air pressure of 3 psi higher than groundwater pressure outside the pipe, up to maximum 6 psi. If groundwater pressure data is not available, use joint testing pressure of 0.5 psi per vertical foot of pipe depth or 6 psi whichever is greater.
- 5. Perform lateral connection testing following ASTM F2454. Seal joints that do not maintain void pressure with pressure drop of less than 2 psi in 15 seconds.

6. If the service lateral connection at the main is longitudinally cracked, fractured or broken pre-testing will not be required. 06-08-2020  Confirmed

3.4 BASIC REQUIREMENTS

A. General.

5. Seal joints, defects or leaking lateral connections that failed air testing or show sign of visible leaks, by internal chemical methods, as directed by Engineer.
6. Grouting of service lateral is prohibited if the grouting location cannot be inspected before and after the sealing procedures.
7. Service laterals cannot be sealed from the mainline when the packer cannot be seated.
8. Protruding laterals are to be cut back within 5/8" prior to sealing.
3. After sealing of joint, defect or connection, perform post air test per ASTM F2304 or ASTM F2454 for mainline sewer sealing and lateral sealing, respectively.
4. Sewer that Engineer deems damaged as a result of Contractor's operations, will be promptly repaired to Engineer's satisfaction at no cost to the Commission.
10. Grouting materials that set to a hard, rigid product capable of intrusion into sewer lines are not acceptable unless specifically approved by Engineer on a case by case basis.
11. Post sealing flow verification is to be made to document the lateral service has been returned to service with unrestrained flow.
12. Provide qualified, independent third-party inspector to observe grouting mixing process, chemical grouting injections process and post grouting pressure testing. Report findings to Engineer.

H. Grout Preparation.

6. Follow the manufacturer's recommendations for the mixing and safety procedures.
7. Adjust gel time as necessary to compensate for changes in temperature in grout component tanks or hoses. The addition of dilution water to extend gel times is not acceptable unless resulting base grout tank only material exceeds 20% by weight for solution grouts.
8. During the grouting process, the Grouting Technician shall monitor the grout component tanks to make sure that proper ratios are being pumped. If unequal levels are noted in the tanks, repeat the pump test as described above and correct any defective equipment.
9. Gel times shall be calculated using the following formula unless CONTRACTOR experience and/or field conditions dictate otherwise. Any alterations of the gel time formula shall be approved by the City.

$$\text{Gel Time} = (\text{Volume of Pipe/Packer Void Space (gal)}/\text{Pumping Rate (gpm)}) (60 \text{ Sec}/1 \text{ Min}) + 20 \text{ Sec (+/- 5sec)}$$

10. Packer/Pipe void shall be defined as the volume between the inflated packer and the inside pipe wall when the packer is inflated per manufacturer recommendations. For example: an 8" pipe with a packer void space of 0.3 gallons and a 3 gpm pumping rate would provide

$$\text{Gel Time} = (.3 \text{ (gal)}/3 \text{ (gpm)}) (60\text{sec}/1 \text{ Min}) + (20 \text{ sec}) = 26\text{sec} (+/- 5\text{sec})$$

I. Grouting General.

3. Grout all joint and lateral connections that failed the pressure test by the injection method. This shall be accomplished by forcing grout through a system of pumps and hoses into and through the joints of the sewer from the packer within the sewer pipe. Remove excess grout from pipe and laterals. Excess grout shall be defined as a thickness of grout that given its location, size and geometry, could cause a blockage. Flush or push forward to the next downstream manhole, remove from the sewer system, and properly dispose of excess grout.

J. Application Procedures for Joint Sealing and Lateral Connection Sealing.

1. Force chemical grouting material into or through faulty joints, defects or lateral connection by system of pumps, hoses, and sealing packers.
 - c. Position packer over faulty joint or lateral connection by means of measuring device and CCTV camera in line.
 - d. For mainline sewers, expand packer end bladders using controlled pressure. For lateral connections use lateral packer equipped with lateral bladder and rotating mechanism.
 - 3) Obtain a tight seal. If a tight seal is not obtained, remove equipment and make adjustments.
 - 4) Pump grout material through hose system at controlled pressures high enough to overcome external pressures such as groundwater pressures.
2. Design pumping unit, metering equipment, and packer devices so proportions and quantities of materials can be regulated following type and size of leak being sealed.
3. Set chemical pumping rates and mixing ratios as specified herein, following manufacturer's recommendations and Engineer's adjustments.
4. Determine appropriate gel set times.
 - h. To estimate gel set times, divide estimated volume of annular space (in gallons) by grout pumping rate (in gallons per minute), then add between 15 to 25 seconds. Adjust estimate by considering temperature of grout tanks, temperature of hoses, temperature of groundwater, amount of groundwater present and other field conditions.
 - i. The gel set time is typically between 20 and 40 seconds. Gel set times of less than 20 seconds may be required in presence of high filtration.
 - j. Monitor induction periods and gel characteristics through daily gel time tests for each sealing vehicle. Check each new batch once. If only one batch is used, check at least twice per day.
 - k. Perform new gel time test when grout additives are modified to change gel times, at beginning of new setup with new starting manhole, or when temperature in tanks and hoses changes by more than 10 degrees F from previous gel time test.
 - l. Use water with known and controlled pH that will be used during actual grouting operations.

- m. Allow grout mixture to settle to remove entrained oxygen, before testing gel time.
- n. Use plastic or stainless-steel tanks. Do not use tanks that contain iron or copper.
- 5. During seal operations, operate void pressure monitoring equipment, described herein.
- 6. Integrate CCTV, grout pumping, and air pressure monitoring equipment so proportions, quantities, and void pressure for materials and sealing can be instantly monitored and regulated following type and size of joint, break, or leak.
- 7. Amount of chemical being pumped: Based on number of pumped strokes delivered for each sealed sewer main joint, defect or leaking connection.
 - a. Record and provide results to Engineer.
- 8. If large voids are encountered on outside of sewer, including the possibility of “piping” holes to ground surface, which could cause excessive use of grout material, at Engineer’s direction change operating pressures and pumping rates as follows.
 - f. Reduce pressures and pumping rates, such that intervals between pump strokes are shorter than gel time.
 - g. Pump first stage of grout, and then stop pumping until temporary gel of the grout is obtained on outside of pipe.
 - h. Increase pressure and pumping rate to pump the second stage and form a second layer.
 - i. Repeat this cycle until refusal conditions are reached, or until the inspector judges the grout consumption to be excessive.
 - j. Avoid sealing inner surface of pipe from inside before building up layers on the outside.
- 10. Grout injection complete: When chemical grout is pumped to refusal as defined in ASTM F2304.
 - c. If chemical grout cannot be pumped to refusal, within a volume less than or equal to 0.5 gallons per inch of pipe diameter due to latent physical conditions, do not perform additional work until Engineer grants authorization.
 - d. Lateral connections: When back pressure of grout in void at mainline level drops from 8 psi to 6 psi in greater than 20 seconds after cessation of grout pumping, following ASTM F2454.
 - 1) If using stage grouting, grout injection is complete when refusal pressure of 8 psi is achieved.
- 10. Sealed Defects.
 - e. Remove excess grout gel ring if obtrusive and impedes air testing and CCTV inspection of work as required. If excess grout gel ring cannot be removed by use of packer, jet clean pipe prior to testing seal.
 - f. Air test each sealed joint.
 - 1) If defect or connection fails air test after grout injection, reseal failed joints and air test again.
 - 2) After lateral connection has been sealed successfully as confirmed by post air test, break lateral packer seal and test service to assure grout has not blocked lateral connection further upstream.

- b) In the event sewage back-up occurs and enters a dwelling, respond within 2 hours of being notified and be responsible for cleanup, repair, property damage costs and claims.
 - g. After all pipe joints and lateral connections have been grouted, retest all previously unsealed pipe joints and lateral connections. Seal any pipe joints and lateral connections that do not pass the air pressure test.
 - h. Payment for post testing of grout sealed joints is to be included in the grouting unit price. 06-08-2020 Conformed
- 12. Flush or push forward excess grouting material to next downstream manhole and remove from sewer system.
 - c. Dispose of debris following grout manufacturer's recommendation, and jurisdictional regulations.
 - d. Excess grout material from upstream section(s) will not be allowed to accumulate in sewer.
- 13. Provide approved plug and/or by-pass pumping if grouting operations restrict or prevent simultaneous sewage flow passage.
 - b. Refer to Section 01516 Collection System Bypass article 1.01 Scope of Work for sewer bypass requirements.
- K. Joint, Defect or Lateral Connection Sealing Verification.
 - 2. Mainline joints and defects.
 - c. Deflate packer bladders after completing each seal until zero void pressure (± 0.5 psi) is shown on the monitoring equipment.
 - d. If zero void pressure (± 0.5 psi) is not achieved, clear residual grout material from packer or make needed equipment adjustments allowing true pressure reading.
 - 4. Re-test joint, defect or lateral connection as described herein.
 - c. Re-seal joints, defects, or connections that do not meet specified test criteria and re-test until test criteria are met, or Engineer determines that joint defect, or lateral connection cannot be sufficiently sealed.
 - d. Additional testing and sealing will be at no additional cost to the City.
- L. Residual Sealing Material.
 - 3. Leave no residual grout material capable of reducing pipe diameter or restricting flow greater than 5 percent pipe capacity.
- M. Obstructions.
 - 2. During course of sealing operations obstructions may be encountered preventing travel of packer and camera.
 - b. Should obstruction not be passable, begin sealing operations from opposite end of sewer reach.
 - 4. If additional obstructions are encountered after re-employment and no means are available for passing obstructions without damage to equipment, remaining sections

of sewer main not sealed may be temporarily excluded from work requirements of Contract, until point repair is completed.

3.5 FIELD DOCUMENTATION

A. Records.

1. Keep complete, accurate, and legible records of operation for each joint, defect or connection sealed.
 - b. Include on Record of Operation for each joint or lateral mainline interface tested and/or routed or attempted to be grouted:
 - 10) Identification of work site, complete component, address, county page & grid, 200-foot sheet.
 - 11) Date and time.
 - 12) Station of each seal measured from upstream manhole.
 - 13) Location of any joints not tested and reason for not testing.
 - 14) Grout mixture formation, including additives and catalyst mixture.
 - 15) Test pressures and durations of tests maintained for each joint passing the air test.
 - 16) Ambient outside air temperature at time of grout injection.
 - 17) Grout tank temperatures.
 - 18) Gel time and time last verified.
 - 11) Verified address of lateral.
 - 16) Estimated visible leakage (gpm) from joint/defect connection or lateral.
 - 17) Number of pump strokes and amount of grout in place.
 - 18) Beginning, ending, pressure losses, re-test pressures.
 - 19) Verification lateral is clear after sealing process.
 - 20) Remaining leakage and location after seal (gpm).
3. Work site will not be accepted until Engineer receives original record.
 - b. Failure to fill out logs completely will result in non-payment for the questioned mainline joint, defect or connection.

4.6 WARRANTY

- G. Provide twelve month performance and workmanship warranty for the seals from date of acceptance and final Work Order invoice payment.
- H. Perform CCTV inspections during the first wet weather season after initial sealing, to evaluate quality of the initial sealing.
- I. CCTV inspect initial retest area consisting of 10 percent of grouted joints and 10 percent of grouted lateral connections following Sections 02762 and 02763.


- J. Provide qualified, independent third-party inspector to review CCTV inspection videos to verify integrity of seals.
- K. Reseal all joints sealed under this Contract that inspector finds defective within warranty period, at no additional cost to the City.
 - 2. Defective seals include, but not limited to those with root penetration, signs of infiltration, and cracks in pipe or grouting material.
- L. If failure rate of retested joints and lateral connections is 5 percent or less of joints and lateral connections retested, work shall be considered satisfactory and no further retesting will be required. If the failure rate of retested joints and lateral connections is greater than 5 percent, the Engineer shall randomly select another retest area consisting of another 10 percent of the initially sealed joints and lateral connections. Continue this additional retesting and resealing until a failure rate of less than 5 percent is met.

3.7 ACCEPTANCE

- A. When sealed joint, defect, and lateral connections pass the post air test.

PART 4 MEASUREMENT AND PAYMENT

8.1 PERFORMANCE DEMONSTRATION TESTING

- C. Measurement: Equipment calibration demonstrated.
- D. Payment: Unit price line item TS1. 06-08-2020 Conformed 

8.2 TEST AND SEAL MAINLINE JOINT OR DEFECT

- B. Measurement: By each joint pre-tested.
- B. Payment: Unit price line item TS2.
 - 2. Payment includes all work necessary to perform testing.
- E. Measurement: By each joint grouted, post-testing.
- F. Payment: Included in each GSx line item unit price.

4.3 TEST AND SEAL LATERAL CONNECTION

- E. Measurement: By each lateral connection pre-tested.
- F. Payment: Unit price line item TS3.
- G. Measurement: By each connection grouted, post-testing.
- H. Payment: Included in Unit price line items GS1.

4.4 SEALING MATERIAL

- A. Measurement: By gallon of grout used, over initial two gallons per joint or lateral connection.
- B. Payment: At unit price listed in Unit Price Schedule.
 - 2. Payment includes materials, additives, storage, calculations, mixing, testing for in-place percentage and gel time tests.

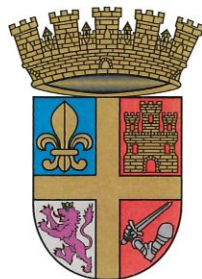
4.5 RETESTING SEALED JOINTS UNDER WARRANTY

- B. Measurement: By unit price for each required item of work.
- B. Payment: At contingent price listed in Unit Price Schedule.
 - 1. Payment includes work related to retesting of sealed joints including cleaning, CCTV inspection, and air testing in the initial retest area only.
 - a. No compensation will be provided for resealing joint that fails air testing or any additional testing beyond initial retest area.

06-08-2020 Conformed



END OF SECTION



October 4, 2021

Insituform Technologies, LLC
Attn: Ms. Diane Partridge
17988 Edison Avenue
Chesterfield, MO 63005

RE: Renewal #1 to Contract #PW2020-06 for Sanitary Sewer Cleaning, Inspection and
Renewal

Dear Ms. Partridge:

Accompanying this cover letter for your firm's records is the completely executed
Renewal #1 to the Agreement between the City of St. Augustine and Insituform Technologies,
LLC for Sanitary Sewer Cleaning, Inspection and Renewal. We look forward to continuing an
excellent working relationship.

Please feel free to contact me at my office (904) 209-4305 or, via email, at
swhitener@citystaug.com if you have any questions.

Sincerely,

Sharon F. Whitener, CPPO
Procurement Manager

SFW

Enclosure

xc: John P. Regan, City Manager
Meredith L. Breidenstein, Assistant City Manager
Reuben C. Franklin, Jr., Public Works Director
James C. Piggott, General Services Director
File

**FIRST RENEWAL OF THE AGREEMENT BETWEEN
THE CITY OF ST. AUGUSTINE
AND INSITUFORM TECHNOLOGIES, LLC FOR SANITARY SEWER CLEANING,
INSPECTION, AND RENEWAL**

THIS RENEWAL AGREEMENT is entered into by and between the CITY OF ST. AUGUSTINE (the "City"), whose mailing address is P. O. Box 210, St. Augustine, Florida 32085, and INSITUFORM TECHNOLOGIES, LLC, ("Contractor"), whose address is 17988 Edison Avenue, Chesterfield, Missouri 63005.

The City entered into an Agreement with Insituform Technologies, LLC on October 7, 2020 for Sanitary Sewer Cleaning, Inspection, and Renewal for a term ending on September 30, 2021. The Agreement included the option to renew up to four (4) consecutive years. The City and Contractor now desire to renew the Agreement for an additional two (2) year term, October 1, 2021 through September 30, 2023 (Renewal #1).

In consideration of the mutual covenants contained herein and for other good and valuable consideration, the parties agree to the following:

1. The Agreement, Contract No. PW2020-06, is renewed for an additional two (2) year term beginning October 1, 2021 and ending September 30, 2023. For satisfactory performance of the Work outlined in the Contract during this additional term period, the City agrees to pay Contractor in accordance with the Agreement's Cost Schedule.

2. **EMPLOYMENT ELIGIBILITY.** Contractor must comply with F.S. 448.095 and use the United States Department of Homeland Security's E-Verify system ("E-Verify") to verify the employment eligibility of all persons hired by Contractor during the term of this Agreement to work in Florida. Additionally, if Contractor uses subcontractors to perform any portion of the Work (under this Agreement), Contractor must include a requirement in the subcontractor's contract that the subcontractor use E-Verify to verify the employment eligibility of all persons hired by subcontractor to perform any such portion of the Work. Contractor must include a requirement in the subcontractor's contract that the subcontractor use E-Verify to verify the employment eligibility of all persons hired by subcontractor to perform any such portion of the work. Answers to questions regarding E-Verify as well as instructions on enrollment may be found at the E-Verify website: www.uscis.gov/e-verify.

All other terms and conditions of the Agreement are hereby ratified and continue in full force and effect.

SIGNATURES APPEAR ON THE FOLLOWING PAGE

Contract #PW2020-06

Renewal #1

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in duplicate, each of which shall be deemed an original on the day and year first below written.

CITY OF ST. AUGUSTINE,
FLORIDA a municipal corporation

ATTEST:

Name:

Darlene Salambes

By:

Meredith Rie

Printed Name:

Meredith Breidenstein

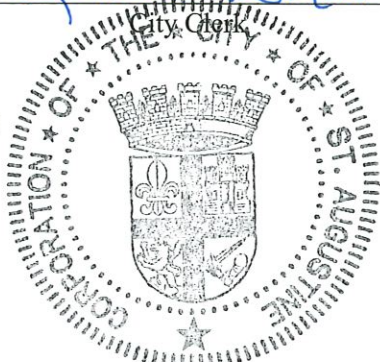
Title:

Assistant City Manager

Date:

9/24/2021

(SEAL)



INSITUFORM TECHNOLOGIES, LLC

Signed, sealed and delivered
in the presence of:

Jana Lause

Witness

Printed Name:

Jana Lause

By:

Diane Partridge

Diane Partridge (Sep 23, 2021 12:29 CDT)

Printed Name:

Diane Partridge

Title:

Contracting and Attesting Officer

Date:

Sep 23, 2021

Witness

Printed Name:

Janet Hass

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

Isabelle C. Lopez

Isabelle C. Lopez, City Attorney











Renewal #1 Contract #PW2020-06 for Sanitary Sewer Cleaning, Inspection and Renewal.

Final Audit Report

2021-09-23

Created:	2021-09-23
By:	Sharon Whitener (swhitener@citystaug.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAoPHZNdPJSJOeOPNHnH0ZAETLFBaz34X0

"Renewal #1 Contract #PW2020-06 for Sanitary Sewer Cleaning , Inspection and Renewal." History

-  Document created by Sharon Whitener (swhitener@citystaug.com)
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-  Document emailed to Diane Partridge (dpartridge@aegion.com) for signature
2021-09-23 - 5:28:04 PM GMT
-  Email viewed by Diane Partridge (dpartridge@aegion.com)
2021-09-23 - 5:28:22 PM GMT- IP address: 38.65.100.100
-  Document e-signed by Diane Partridge (dpartridge@aegion.com)
Signature Date: 2021-09-23 - 5:29:00 PM GMT - Time Source: server- IP address: 38.65.100.100
-  Document emailed to Jana Lause (jlause@aegion.com) for signature
2021-09-23 - 5:29:03 PM GMT
-  Email viewed by Jana Lause (jlause@aegion.com)
2021-09-23 - 6:03:02 PM GMT- IP address: 155.186.58.245
-  Document e-signed by Jana Lause (jlause@aegion.com)
Signature Date: 2021-09-23 - 6:03:48 PM GMT - Time Source: server- IP address: 155.186.58.245
-  Document emailed to Janet Hass (jhass@aegion.com) for signature
2021-09-23 - 6:03:50 PM GMT
-  Email viewed by Janet Hass (jhass@aegion.com)
2021-09-23 - 6:22:07 PM GMT- IP address: 24.107.83.92
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Signature Date: 2021-09-23 - 6:22:37 PM GMT - Time Source: server- IP address: 24.107.83.92



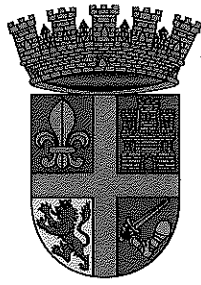
Adobe Sign

✔ Agreement completed.

2021-09-23 - 6:22:37 PM GMT



Adobe Sign



CITY OF
ST AUGUSTINETM
— EST. 1565 —
NATION'S OLDEST CITY

October 28, 2021

Insituform Technologies, LLC
Attn: Ms. Diane Partridge
17988 Edison Avenue
Chesterfield, MO 63005

RE: Amendment #1 to Contract #PW2020-06 for Sanitary Sewer Cleaning, Inspection and Renewal

Dear Ms. Partridge:

Accompanying this cover letter for your firm's records is the completely executed Amendment #1 to the Agreement between the City of St. Augustine and Insituform Technologies, LLC for Sanitary Sewer Cleaning, Inspection and Renewal. We look forward to continuing an excellent working relationship.

Please feel free to contact me at my office (904) 209-4305 or, via email, at swhitener@citystaug.com if you have any questions.

Sincerely,

Sharon F. Whitener, CPPO
Procurement Manager

SFW

Enclosure

xc: John P. Regan, City Manager
Meredith L. Breidenstein, Assistant City Manager
Reuben C. Franklin, Jr., Public Works Director
James C. Piggott, General Services Director
File

**FIRST AMENDMENT TO THE AGREEMENT BETWEEN
THE CITY OF ST. AUGUSTINE
AND INSITUFORM TECHNOLOGIES, LLC FOR SANITARY SEWER CLEANING,
INSPECTION AND RENEWAL**

THIS AMENDMENT is entered into by and between the CITY OF ST AUGUSTINE ("City"), whose mailing address is P.O. Box 210 St. Augustine, Florida 32085-0210, and INSITUFORM TECHNOLOGIES, LLC. ("Contractor"), whose address is 17988 Edison Avenue, Chesterfield, Missouri 63005, and is effective on the date the last party has executed same.

PREMISES:

The parties entered into Agreement No. PW2020-06 on October 7, 2020, for Sanitary Sewer Cleaning, Inspection and Renewal Services ("Agreement") for a term ending on September 30, 2020. The Agreement included the option to renew up to four (4) consecutive years. On September 24, 2021, the Agreement was extended for a two (2) year term, Renewal #1.

The parties desire to further amend the Agreement.

NOW, THEREFORE, in consideration of the above premises, which are hereby made a part of this amendment, the mutual covenants contained herein, and other good and valuable consideration, the parties hereby agree to amend the Agreement as follows:

1. Replace the following sections in Exhibit A – Scope of Work with the attached revised sections:
 - a. Section 01570 – Maintenance of Traffic
 - b. Section 02761 – Cleaning Sanitary Sewer Systems
 - c. Section 02762 – Televising Sanitary Sewer Systems
 - d. Section 02771 – Cure-In-Place Pipe for Sanitary Sewer Renewal
2. Replace the following categories in Exhibit D – Unit Price Schedule with the revised categories:
 - a. Maintenance of Traffic (St. Johns County & FDOT)
 - b. Sanitary Sewers Renewal, Sanitary Main CIPP Lining

All other terms and conditions of the Agreement, including any subsequent amendments, are hereby ratified and continue in full force and effect.

*****SIGNATURES ON FOLLOWING PAGE*****

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Amendment in duplicate, each of which shall be deemed an original on the day and year written below.

CITY OF ST. AUGUSTINE,
FLORIDA a municipal corporation

ATTEST:

Name:

Darlene Salankor
City Clerk

By:

Meredith Breidenstein

Printed Name: Meredith Breidenstein

Title: Assistant City Manager

Date: 10/26/21

(SEAL)



INSITUFORM TECHNOLOGIES, LLC

Signed, sealed and delivered
in the presence of:

Jana Lause

Witness

Printed Name: Jana Lause

By: Diane Partridge
Diane Partridge (Oct 25, 2021 09:53 CDT)

Printed Name: Diane Partridge

Title: Contracting and Attesting Officer

Date: Oct 25, 2021

Janet Hass
Janet Hass (Oct 25, 2021 10:58 CDT)

Witness

Printed Name: Janet Hass

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

Isabelle C. Lopez

Isabelle C. Lopez, City Attorney

Attachments:

- Section 01570 – Maintenance of Traffic
- Section 02761 – Cleaning Sanitary Sewer Systems
- Section 02762 – Televising Sanitary Sewer Systems
- Section 02771 – Cure-In-Place Pipe for Sanitary Sewer Renewal
- Maintenance of Traffic (St. Johns County & FDOT)
- Sanitary Sewers Renewal, Sanitary Main CIPP Lining


Amendment #1 PAT

Final Audit Report

2021-10-25

Created:	2021-10-19
By:	Sharon Whitener (swhitener@citystaug.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA-2RqRL2eBVhAZT1NOifYWIVgU5uwPVqE

"Amendment #1 PAT" History

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Signature Date: 2021-10-25 - 3:58:16 PM GMT - Time Source: server- IP address: 24.107.83.92

 Agreement completed.

2021-10-25 - 3:58:16 PM GMT

REVISED SECTION 01570

MAINTENANCE OF TRAFFIC

PART 3 - GENERAL

3.01 DESCRIPTION

- A. This section includes identifying safety hazards and then furnishing all necessary labor, materials, tools, and equipment including, but not limited, to signs, barricades, traffic drums, cones, flashers, construction fencing, flag persons, variable message boards, uniformed police officers, warning devices, temporary pavement markings, temporary sidewalk, delineators, etc., to maintain vehicular and pedestrian traffic through and adjacent to the project area. These measures and actions shall be taken to safely maintain the accessibility of public and construction traffic by preventing potential construction hazards. All materials, work and incidental costs related to Maintenance of Traffic will be paid for at the contract lump sum price.

3.02 REQUIREMENTS

- A. The Traffic Control Plan shall conform to the following standards:
1. Standard Specifications for Road and Bridge Construction, latest edition including all subsequent supplements issued by the Florida Department of Transportation, (FDOT).
 2. Manual on Uniform Traffic Control Devices for Streets and Highways by U.S. Department of Transportation, Federal Highway Administration.
 3. All references to the respective agencies in the above referenced standards shall be construed to also include the municipality as applicable for this Work.
- B. Sequence the Work in a manner that will minimize disruption of vehicular and pedestrian access through and around the construction area.
- C. Traffic planning and control for the maintenance and protection of pedestrian and vehicular traffic affected by the Contractor's Work includes, but is not limited to:
1. Construction and maintenance of any necessary detour equipment and facilities.
 2. Providing necessary facilities for access to residences and businesses.
 3. Furnishing, installing, and maintenance of traffic control and safety devices (e.g. signage, barricades, barriers, message boards, etc.), and flag persons as appropriate during Construction.
 4. Control of water runoff, dust and any other special requirements for safe and expeditious movement of traffic.
- D. Planning, maintenance and control of traffic shall be provided at the Contractor's expense. The Contractor will bear all expense of maintaining the vehicle and pedestrian traffic throughout the work area.
- E. The Contractor will ensure all personnel involved in traffic control are and capable of communicating with the public. The Contractor may be required to hire off-duty uniformed

police officers, in addition to flag persons, to direct and maintain traffic. Locations and conditions requiring such uniformed police officers shall be as directed by the City. The Contractor shall be required to utilize uniformed police officers for work within FDOT maintained ROW, road closures affecting school traffic and during all night work involving a road closure or crossing on nonresidential roads.

- F. The Contractor will remove temporary equipment and facilities when no longer required, restore grounds to original, or to specified conditions.
- G. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

3.03 SUBMITTALS

- A. Submit at Contractor's own expense a Traffic Control Plan for approval by the controlling roadway agency (FDOT, St. John's County Public Works or other local government) having jurisdiction over the road for approval.
 - 1. The Traffic Control Plan will detail procedures and protective measures proposed by the Contractor to provide for protection and control of traffic affected by the Work consistent with the following applicable standards:
 - 1. Standard Specifications for Road and Bridge Construction, latest edition including all subsequent supplements issued by the Florida Department of Transportation, (FDOT Spec.).
 - 2. Manual of Traffic Control and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations, FDOT.
 - 3. Right-of-Way Utilization Regulations, St. John's County, Florida, latest edition.
- B. All references to the respective agencies in the above referenced standards shall be construed to also include the municipality as applicable for this Work.
- C. The Traffic Control Plan will be signed and sealed by a Professional Engineer registered in the state of Florida and shall include proposed locations and time durations of the following, as applicable:
 - 1. Pedestrian and public vehicular traffic routing.
 - 2. Lane and sidewalk closures, other traffic blockage and lane restrictions and reductions anticipated to be caused by construction operations. Show and describe the proposed location, dates, hours and duration of closure, vehicular and pedestrian traffic routing and management, traffic control devices for implementing pedestrian and vehicular movement around the closures, and details of barricades.
 - 3. Location, type and method of shoring to provide lateral support to the side of an excavation or embankment parallel to an open travel-way.
 - 4. Allowable on-street parking within the immediate vicinity of worksite.
 - 5. Access to buildings immediately adjacent to worksite.
 - 6. Driveways blocked by construction operations.
 - 7. Temporary traffic control devices, temporary pavement striping and marking of streets and sidewalks affected by construction
 - 8. Temporary commercial and industrial loading and unloading zones.
 - 9. Construction vehicle reroutes, travel times, staging locations, and number and size of

vehicles involved.

- D. Obtain and submit prior to erection, or otherwise impacting traffic, all required permits from all authorities having jurisdiction, excluding City of St. Augustine Public Works, if applicable.

PART 4 - PRODUCTS

4.01 MATERIALS AND EQUIPMENT

- A. The Contractor shall furnish, erect, and maintain all necessary traffic control devices, including flag person, in accordance with the Manual of Uniform Traffic Control Devices for Streets and Highways published by the U.S. Department of Transportation, Federal Highway Administration.

1. FLAG PERSONS

1. All flag persons used on this Project will adhere to the following requirements:
2. Any person acting as a flag person on this Project will have attended a training session taught by a Contractor's qualified trainer before the start date of this Contract.
3. The Contractor's qualified trainer will have completed a "Flag person Train the Trainer Session" in the 5-years previous or before the start date of this Contract and will be on file as a qualified flag person trainer.
4. The flag person trainer's name and Qualification Number will be furnished by the Contractor at the Pre-Construction meeting. The Contractor will provide all flag persons with the Flag Person Handbook and will observe the rules and regulations contained therein. This handbook will be in the possession of all flag person while flagging on the Project.
5. Flag persons will not be assigned other duties while working as authorized flag persons.
6. Any person replacing flag person for break shall have the same training.

PART 5 - EXECUTION

5.01 NOTIFICATIONS

- A. Refer to Section 01001, General Work Requirements paragraph 1.16 for notification requirements.

5.02 GENERAL TRAFFIC CONTROL

- A. The Contractor will sequence and plan construction operations and will generally conduct Work in such a manner as not to unduly or unnecessarily restrict or impede normal traffic.
- B. Unless otherwise provided, all roads within the limits of the Work will be kept open to all traffic by the Contractor. The Contractor will keep the portion of the project being used by public traffic, whether it is through or local traffic, in such condition that traffic will be

adequately accommodated.

- C. The Contractor will be responsible for installation and maintenance of all traffic control devices and requirements for the duration of the construction period. Necessary precautions for traffic control will include, but not be limited to, warning signs, signals, lighting devices, markings, barricades, canalizations, and hand signaling devices.
- D. The Contractor will provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages and farms.
- E. The Contractor will always provide emergency access to all residences and businesses. Residential and business access will always be restored and maintained outside of the Contractor's normal working hours.
- F. Traffic is to be maintained on one section of existing pavement, proposed pavement, or a combination thereof. Alternating one-way traffic may be utilized and limited to a maximum length of 500-feet during construction hours. Lane width for alternating one-way traffic will be kept to a minimum width of 10-feet, or as directed by the City.
- G. Travel lanes and pedestrian access will be kept reasonably smooth, dry, and in a suitable condition at all times.
- H. The Contractor will make provisions at all "open cut" street crossings to allow for free passage of vehicles and pedestrians, either by bridging or other temporary crossing structures. Such structures will be of adequate strength and proper construction and will be maintained by the Contractor in such a manner as not to constitute an undue traffic hazard.
- I. The Contractor will keep all signs in proper position, clean, and legible at all times. Care will be taken so that weeds, shrubbery, construction materials, equipment, and soil are not allowed to obscure any sign, light, or barricade. Signs that do not apply to construction conditions should be removed or adjusted so that the legend is not visible to approaching traffic.
- J. The City may determine the need for, and extent of, additional striping removal and restriping.
- K. Excavated material, spoil banks, construction materials, equipment and supplies will not be located in such a manner as to obstruct traffic, as practicable. The Contractor will immediately remove from the site all demolition material, exercising such precaution as may be directed by the City. All material excavated shall be disposed of to minimize traffic and pedestrian inconvenience and to prevent damage to adjacent property.
- L. During any suspension, the Contractor will make passable and open to traffic such portions of the Project and/or temporally roadways as directed by the City for accommodation of traffic during the anticipated period of suspension. Passable conditions will be maintained until issuance of an order for the resumption of construction operations. When Work is resumed, the Contractor will replace or renew any Work or materials lost or damaged because of such temporary use in every respect as though its prosecution had been

continuous and without interferences.

PART 4 – METHOD OF MEASUREMENT AND PAYMENT

4.01 UNIT Price Schedule line items TM1, TM2, and TM3 are lump sum unit price per each date of traffic control provided in accordance with the respective FDOT index.

4.02 Unit Price Schedule line items TM4 and TM8 are lump sum unit price for each week of traffic control provided ion accordance with the respective FDOT index.

4.03 Unit Price Schedule line items TM5, TM6 and TM7 are cost plus a fee for overhead and profit. Costs directly associated with these traffic control indexes and flagmen will be documented with paid invoices from suppliers and subcontractors. A 10% fee will be applied to the total invoiced for each line item.

END OF SECTION

REVISED SECTION 02761
CLEANING SANITARY SEWER SYSTEMS

1) PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The Work covered in this section consists of cleaning sewer and sanitary lateral lines prior to the internal television inspection(s) for new or existing Storm and wastewater systems.
- B. Sanitary Gravity Main and Service Lateral Cleaning: The intent of gravity main cleaning is to remove debris that may be causing a reduction in flow capacity, potential sewer backups, or that limits the ability to evaluate the structural condition of the pipe segment. On all sewers, the Contractor shall perform sewer-cleaning work to an acceptable level as necessary to perform a thorough television inspection of the sewer. An acceptable level is defined as the removal of all debris throughout the pipe segment cleaned. If the pipe condition is such that cleaning may cause a potential collapse, then the pipe shall be televised without attempting to clean it pending approval by the City.
- C. Water for Cleaning: The City shall provide access to water via fire hydrants for cleaning and other work items requiring water. The Contractor will be responsible for obtaining a transient water meter and paying for water used during course of cleaning. Additional compensation will be scheduled for extending water for cleaning greater than 500 feet from the main section to be cleaned.
- D. Recovering of Equipment: The Contractor will be responsible for recovering any equipment that becomes lodged or lost in the pipeline. The Contractor will be responsible for all costs associated with required evacuation, restoration of roads and easements, and repairs to pipes and manholes as needed to restore the pipeline and appurtenances back to their original conditions.
- E. Maintenance of Traffic (MOT)
 - (1) Refer to General Requirements Section 01570, Maintenance of Traffic requirements.
 - (2)
- F. Existing Utilities: The Contractor must take the necessary precautions for the protection of any utility encountered on the project or the restoration of any utility damaged during the work.
 - 1. If an excavation is required, the Contractor shall notify, at least 48 hours before breaking ground, all public or private service corporations having wire, poles, pipes, conduit, manholes, or other structures that may be affected by this operation, including all structures which are affected and not shown on these plans. Owners of underground utilities, which are members of the state's one call service, can be notified by calling. Non-member underground utility Owners must be called directly.
 - 2. All maintenance, repair, and replacement of existing utilities shall be in accordance with the rules and regulations of the various utility companies having jurisdiction.
 - 3. All existing storm sewers, driveway drains, surface drainpipes and other property,

removed or damaged during work to clean and inspect the sewers shall be repaired and reconnected by the Contractor as directed by the City at no additional cost to the City.

(3)

G. Request for Supplementary Information

(4)

1. It shall be the responsibility of the Contractor to make timely requests of the City for supplemental information, which should be furnished by the City under the terms of this contract, and as required in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved to avoid delay.
2. B. Each request shall be in writing and list the various items and the latest day by which each will be required by the Contractor. The first list shall be submitted within two (2) weeks after contract award and shall be as complete as possible at that time. The Contractor shall, if required, furnish promptly any assistance and information the City may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for all delays arising from failure to comply with this section.

H. Use of Premises

1. The Contractor shall not trespass upon or in any way disturb private property without first obtaining written permission from the property Owner and/or Owner or Prime Contractor as appropriate to do so. A copy of such written permission shall be furnished to the City prior to accessing the site.
2. It shall be the Contractor's responsibility to work equipment around poles, trees, or other obstructions and to do so at his own expense.
3. If the Contractor finds it necessary to obtain additional working area, it shall be the Contractor's responsibility for its acquisition.
4. The Contractor shall, at no additional expense, restore such property to the original condition in the sole and unfettered opinion of the property Owner. The Contractor must take photographs and/or videos of existing properties prior to disturbance of each property and make a copy available to the City.
5. All items within the street right-of-way or sewer easement shall be removed, or removed and replaced, or restored as directed by the City.
6. The Contractor shall ensure all employees have a badge or visible identification during any time that they on the project site or within private property. This identification must be worn so that it is readily recognized and readable to the public.

I. Protection of Trees

1. The Contractor shall avoid any unnecessary damage to trees. Branches which overhang the project limits, and which interfere with the operation of equipment shall be tied back to avoid damage, if possible. Where injury to branches is unavoidable, the branches shall be sawed off neatly at the trunk or main branch, and the cut area shall be protected with approved pruning spray immediately. The Contractor at no additional expense shall remove any trees damaged beyond saving and make restitution to the Owner (public or private).

J. Fencing

1. Any fences, including hedge and shrubs, that need to be removed to facilitate the work shall be replaced, in kind or with repairs satisfactory to the Owner, at the Contractor's expense. Replacement of fences, hedges, and shrubs shall be considered incidental to the

contract and not measured for payment.

K. Restoration

1. All roadway berms and drainage ditches disturbed by the work shall be restored, reshaped, and graded to drain.
2. Pavement restoration, if necessary, shall conform to the City, County, or State standards and specifications depending upon who has jurisdiction for the street. Trench backfill and compaction shall be in conformance with the local street restoration jurisdiction.
3. The remediation of sunken trenches caused by activities conducted in this contract shall be the Contractor's responsibility. Sunken areas shall be backfilled and compacted to meet adjoining grades; the surface shall be re-seeded or resurfaced with asphalt or concrete matching the existing surfacing.
4. The Contractor shall restore unpaved areas by seeding and mulching. No direct payment will be made for seeding and mulching.
5. Driveways shall be restored in accordance with Owner's regulations, or the Owner's Specifications depending upon who has jurisdiction for the driveway.
6. All disturbed areas shall be restored as nearly as possible to their original condition.
7. All restoration shall be completed in strict accordance with the appropriate items of the standards, specifications or matching the pre-work conditions as directed by the Owner.
8. The cost of all restoration of streets, drives, walks; sod, etc. shall be incidental to the contract and not measured for payment.
9. Restoration shall be kept current with the project work. Failure to keep restoration of these items completed reasonably close shall result in a stop work notice and delay of payment until such restoration is completed to the satisfaction of the Owner.

L. Cleanup

1. The Contractor shall keep the work area in an uncluttered condition by the frequent removal of debris. The Contractor shall remove all debris and unused material and leave the area in a condition similar to the condition of the area before any work was performed.

M. Property Damage

1. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

N. Access to Municipal Water Supplies

1. The City will make available a construction hydrant meter for cleaning water supply.
 - ii)

O. Reference Technical Specification 02766, Sanitary Sewer Obstruction Removal for requirements related to protruding taps and other obstructions and for further requirements regarding root removal.

P. Responsibility for Overflows and Sills

1. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

Q. Installer Experience and Qualifications

1. Refer to Section 01001 General Work Requirements paragraph 1.02.B for minimum lining work experience. 06-08-2020 Conformed



1.02 CLEANING EQUIPMENT

A. Hydraulically Propelled Equipment:

1. The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery for grease removal. Special precautions to prevent flooding of the sewers and public or private property shall always be taken. Storm/Sewer cleaning balls or other such equipment which cannot be collapsed instantly to provide an immediate unobstructed flow-way during emergency conditions will not be considered as acceptable cleaning equipment. The movable dam shall be of equal diameter as the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure total removal of the grease of obstruction.

B. High-Velocity Jet (Hydro-Cleaning) Equipment:

2. All height velocity hydraulic sewer cleaning equipment shall be truck mounted. The equipment shall have a minimum of 500 feet of $\frac{3}{4}$ inch I.D. high pressure hose with a selection of two or more high velocity nozzles. The nozzles shall have a capacity of 30 GPM at a minimum working pressure of 1000 psi. The nozzles shall be capable of producing a scouring action of 15 to 45 degree in the direction of cleaning and perpendicular to the sewer axis in all size lines designated to be cleaned. Equipment shall also include a high velocity gun for washing and scouring manhole walls and floor. The gun capacity shall equal 3.5 to 27 GPM at between 200 and 800 psi. The gun shall be capable of producing flows from a fine spray to a long-distance solid stream. The equipment shall carry its own 1200-gallon (minimum) water tank capable of holding corrosive or caustic cleaning, sanitizing or degreasing chemicals if required by the City, auxiliary engines and pumps, and hydraulically driving hose reel. All controls shall be located so that the equipment can be operated underground.

C. Mechanically Powered Equipment:

3. Bucket machines shall be in pairs with each machine powered by a minimum of a 16-horsepower engine to ensure sufficient pulling power. Machines shall have an overload device. Machines with direct drive that could cause damage to the pipe will not be used. The belt clutch gear reduction shall be a combination of approximately 83 to 1 reduction in low speed and 55 to 1 in high speed. The power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750-feet of rod. The rod shall be specially heat-treated steel, designed for the purpose intended. The machine shall have a positive rod drive and product a 2,000-pound rod pull. To ensure safe operation, the machine shall be fully enclosed body and an automatic safety throw-out clutch or relief valve. The final pass shall be with a brush large enough to assure that the line has been cleaned sufficiently. This brush shall be mechanically driven, with the power mechanism properly sized. All electrical drops required by the Contractor shall be arranged by the Contractor.

D. Vacuum machines:

4. May be used for removal of materials from manholes when other cleaning equipment is used to dislodge and transport material to the access point.

E. Combination Cleaner:

5. For cleaning small and large diameter sewer, the Contractor may use a combination hydraulic high-volume water and solids separation system. Water volume of up to 250-gpm at or above 2,000-psi will move solids to the downstream manhole in high flow conditions. The separation system will dewater solids to 95 % (passing a paint filter test) and transfer them to a dump truck, if needed, for transport to a water reclamation facility, approved landfill, or other location specified by the County or designee. Wash water will be filtered to a point where it can be used in the pump for continuous cleaning. No bypassing of sewer flows will be necessary. The unit shall be capable of 24-hour operation and the unit shall not leave the manhole until a section is fully cleaned.

1.03 CAPTURE AND REMOVAL OF DEBRIS:

- A. The Contractor shall furnish equipment, either specialized or stand in the industry, for the purpose of preventing debris from being washed past the manhole, inlet, or outfall downstream of the line segment being cleaned, and for removing the debris from the structure before any damage is caused to the system performance and or system equipment such as pump/lift stations, check valves, flow-ways, etc. The cost of all system downtime and repairs to restore operational status resulting from construction debris damage that in the City's opinion was reasonably preventable will be borne by the Contractor.

1.04 QUALIFICATIONS

iii)

- A. Refer to Section 01001 General Work Requirements paragraph 1.01.A for sewer cleaning minimum qualifications.

1.05 SHOP DRAWINGS AND SUBMITTALS

- A. Submittals shall be submitted to the City for review and acceptance prior to cleaning.
 1. Schedule of work:
 - a. Work Schedule. This schedule shall outline the sequence in which the Contractor proposes to conduct his operations and shall be submitted to the City two weeks in advance of performing work and provide the City a reasonable opportunity to observe and inspect work. The Contractor shall use a time-scaled format listing each segment of sewer to be cleaned. The level of detail of activities shall provide clear, concise communication of the plan of work. At a minimum, activities showing initial mobilization, start-up, and cleaning.
 - b. Original and updated schedules must be provided to the City in writing. The software used for producing the schedules must have the capability to tailor the form and format of schedules, and accompanying reports, may be use of Microsoft excel, project with similar formats.
 - c. The City may require additional updates to the schedule as changes occur. These additional updates will be submitted to the City within 24 hours of the request. Changes to the schedule are subject to approval of the City.

- d. Schedule is to be updated weekly
- 2. Proposed cleaning equipment.
- 3. SDS for chemical cleaning products to be used.
- 4. **Cleaning log** in a format acceptable to the City for purposes of recording pertinent information relative to the storm water main and sanitary sewer main and structures being cleaned.
- 5. Chemical root control agent shall be registered with the EPA and the State Department of Agriculture as a General Use Herbicide and shall be labeled for use in sanitary sewers to control tree roots.

B. Post Cleaning submittal.

- 1. Cleaning log including any pertinent information observed during cleaning.
 - (a) A daily log shall be maintained to record the location of the manholes and sewer
 - (b) lines, lengths of the lines cleaned, method of cleaning, line sizes, identify type of
 - (c) cleaning (light, medium, or heavy), and type of debris moved. Observations are to be
 - (d) recorded on a cleaning report form.
 - (e)

2) PART 2 - PRODUCTS – NOT USED

3) PART 3 - EXECUTION

4) 3.01 GENERAL

- A. The Contractor shall furnish and maintain, in good condition, all cleaning and equipment necessary for proper execution of the work.
- B. Maintaining Flow: It will be the responsibility of the Contractor, throughout the tenure of this contract, to provide and always maintain sufficient flow to pass any flash of storm flow of drainage ditches and prevent any backwater flooding due to obstruction caused by cleaning equipment.
- C. Refer to Section 01001, General Work Requirements paragraph 1.16.C for
 - (1) Notification of Public or Customers. No sewer or water service is to be shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.

3.02 SITE VISIT:

- A. The Contractor shall be responsible for conducting a physical reconnaissance of the area to be cleaned in order to verify the location of known and/or accepted manholes or inlets.
- B. The Contractor shall utilize a magnetic locator to attempt to identify the location of buried manhole covers and notify the City representative so that City personnel can excavate and bring the manhole up to grade prior to cleaning. Under no circumstances shall the Contractor excavate buried manholes without prior authorization from the City.

5.03 QUALITY ASSURANCE:

- A. Refer to Section 01101 article 3.03 and 304 for quality assurance and inspection requirements.

5.04 ISOLATION AND BYPASS OPERATIONS

- A. Refer to Section 01516 Collection System Bypass article 1.01 Scope of Work for sewer bypass requirements.

3.05 CLEANING PRECAUTIONS

- B. All necessary precautions shall be taken to protect the sewer from damage during all cleaning and preparation operations. Precautions shall also be taken to ensure that no damage is caused to public or private property adjacent to or served by the sewer or its branches. The Contractor shall pay for and restore, at no additional costs to the City, any damage caused to public or private property because of such cleaning and preparation operations.
- C. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant. All requirements shall be met when accessing a fire hydrant including but not limited to meters, backflow preventers, and properly trained personnel. It shall be the Contractor's responsibility to meet all state and local requirements.

5.06 HYDRAULIC CLEANING METHODOLOGY:

- A. High Velocity Cleaning Methodology: High velocity hydro-cleaning shall consist of cleaning and flushing of the sewer line by means of water pumped into the line at a high velocity. This shall be accomplished using approved equipment to deliver water to a self-propelled nozzle to do the necessary cleaning and flushing. As many passes as necessary shall be made to sufficiently clean the sewer line. 06-08-02020 Conformed


5.07 MECHANICAL CLEANING METHODOLOGY:

- A. Rodding: Cleaning shall be with a power-driven continuous steel rod of sufficient length and gauge with the proper cleaning heads or augers, to loosen all solids or other materials. It shall also provide a means to thread a cable for the power winch.
- B. Bucket Machine: Removal of all solids, materials and other debris shall be by means of a clam-shell type bucket and/or other appliance dragged through storm water main or sewer line with power winches of suitable size and horsepower.
- C. Supplemental Cleaning: After all material has been removed by mechanical cleaning, a minimum of one pass using hydraulic cleaning methods shall be performed to ensure complete removal of material from the walls of the pipe. Any damage to pipes will be repaired.

5.08 SPECIAL CLEANING REQUIREMENTS FOR CAST IRON PIPE:

- A. After cleaning pipe of normal sewage deposits such as sand and grease by methods above, the pipe shall be cleaned of tuberculation, including rust build-up and mineral deposits. For pipe diameters greater than 24-inch, the Contractor may choose any equipment necessary to remove the tuberculation, such as a "pig" or rodder; For pipe diameters less than or equal to 24-inch, all tuberculations shall be removed using either a high pressure water blaster capable of delivering a minimum 40 gallons per minute at a pressure of 10,000 psi, mechanically or hydraulically driven chain flail, grinding chain cutters or other suitable means of removal of tuberculation. However, no equipment shall be used which may damage the pipe, manholes, street, or downstream pump stations without arranging emergency provisions to repair or replace the main being cleaned.

5.09 CLEANING

- A. If cleaning of an entire sewer section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning attempted again. If results of the cleaning are favorable, the Contractor will proceed with the TV inspection. All sludge, dirt, sand, rocks, and other solid or semisolid materials resulting from the cleaning operation shall be removed from the downstream manhole of the section being cleaned. The Contractor shall not be responsible for removing mortar or other material that is securely attached to the pipe walls or joints.
- B. Materials shall be disposed of from the site at least once at the end of each workday. The Contractor will be responsible for the disposal of materials removed from the sewer system. All sewer-cleaning efforts shall require documentation of all quantities and types of materials removed during cleaning.
- C. The designated sewer main shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment approved by the City. Cleaning shall consist of normal hydraulic jet cleaning to facilitate the internal CCTV inspection.
- D. Types of cleaning of sanitary sewers:
1. Light cleaning of sewers consists of a maximum of 1 pass of the jet nozzle. Light cleaning of laterals will consist of flushing water into a cleanout. Resulting in removal of $\frac{1}{4}$ pipe diameter depth or less of sand and/or debris from a section of pipe. The removal of roots, barnacles/oysters and/or tuberculation would be considered a separate item.
 2. Medium cleaning of sewers consists of 2 to 4 passes of the jet nozzle. Medium cleaning of laterals will consist of 1 to 4 passes with a jet nozzle. Resulting in removal of greater than $\frac{1}{4}$ and up to and including $\frac{1}{2}$ pipe diameter depth of sand and/or debris from a section of pipe. The removal of roots and/or tuberculation would be considered a separate item.
 3. Heavy cleaning consists of 5 or more passes of the jet nozzle such as removing heavy grease and debris. Resulting in the removal of greater than $\frac{1}{2}$ pipe diameter depth of sand and/or debris from a section of pipe. The removal of roots and/or tuberculation would be considered a separate item. 06-08-2020 Conformed 
 4. Descaling of Ductile/Cast Iron pipe: Multiple passes with mechanical equipment to remove scale build up to restore pipe to original inside diameter.
- (2)

- E. Selection of the equipment used shall be based on the conditions of lines at the time the Work commences. The equipment and methods selected shall be satisfactory to the City. The equipment shall be capable of removing dirt, grease, rocks, sand, debris, other materials, and obstructions from the sewer lines, laterals, and manholes.
- F. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. The intent of preparatory cleaning is to provide sufficient cleaning to ensure camera passage and the internal conditions of the pipeline can be fully assessed.
- G. If the City establishes that a section of the pipeline cannot be adequately cleaned due to broken, collapsed, or void areas, then the inspection will be attempted up to the obstruction.

5.10 ROOT REMOVAL

- A. Roots shall be removed in the designated sections where root intrusion is a problem and where authorized by the City. Special attention should be used during the cleaning operation to remove roots from the joints. Any roots that could prevent the proper application of chemical sealants or could prevent the proper seating and application of cured-in-place liners shall be removed. Procedures may include the use of mechanical equipment such as, rodding machines, bucket machines, winches using root cutters, porcupines, chain-cutter, saw blade and equipment such as high-velocity jet cleaners. 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 the line. Reference Technical Specification 02766, Sanitary Sewer Obstruction Removal for further requirements regarding root removal. 06-08-2020 Conformed

5.11 CHEMICAL ROOT TREATMENT

- A. To aid in the removal of roots, main sections that have root intrusion shall be treated with an acceptable herbicide. The application of the herbicide 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 City, shall be replaced by the Contractor at no additional cost to the City. All safety precautions as recommended by the manufacturer shall be adhered to for handling and application of the herbicide. 06-08-2020 Conformed
- B. The Contractor must always have a State Certified Pesticide Applicator on site when doing chemical applications.
- C. The Contractor shall take all steps necessary and appropriate to prevent adverse effect on wastewater treatment plant processes during the application process.
 - 1. The active ingredient shall not adversely affect wastewater treatment plant processes.

ii)

5.12 STORM DRAIN OUTFALL BARNACLE/OYSTER REMOVAL

- A. Removal of barnacle, oyster or similar build up at the end of stormwater pipes shall be removed at the face of the stormwater outfall (i.e. Headwall) and up into the stormwater pipe

a distance at least two times the existing pipe diameter. Additionally, all outfall pipe cleaning shall include cleaning of the headwall structure 24-inches around all pipe sizes. For example, a 36-inch stormwater pipe would be cleaned from barnacle, oyster or similar build up at least 72-inches into the pipe itself, and 24-inches around the outfall pipe on the headwall structure.

5.13 MATERIAL REMOVAL AND DISPOSAL

- A. All sludge, dirt, sand, rocks, grease, roots, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Contractor shall provide appropriate screening to stop passing of materials into downstream sewers. All solid or semisolid materials dislodged during cleaning operations shall be removed from the sewer by Contractor at the downstream manhole of the sewer section being cleaned. The passing of dislodged materials downstream of the sewer segment being cleaned shall not be permitted. In such an event, as observed or detected by the City or any third party, Contractor shall be responsible for cleaning the affected downstream sewers in their entirety, at no additional cost to the City.
- B. The Contractor shall be responsible for the disposal of all waste materials and shall transport waste materials to the nearest City Wastewater Treatment Plant for processing. City shall approve all waste material disposal schedules. The selected Contractor(s) shall be responsible for all waste material spills and clean-up in the loading, hauling and unloading of the Contractors equipment.
- C. The contractor shall be responsible for conforming to any and all requirements regarding hauling and disposal of waste from each work site in accordance with OSHA regulations and those that may be mandated by federal, state, or local governments. The contractor shall ensure that all waste material transporters possess all required federal, state and local regulations, including but without limitation, 40 CFR Part 263, "Standards Applicable to Transporters of Hazardous Waste" and Chapter 17-730, Part 3 Florida Administration Code, as may be amended from time to time.
- D. The Contractor shall keep his haul route and work area(s) neat, clean, and reasonably free of odor, and shall bear all responsibility for the cleanup of any spill.

5.14 ACCEPTANCE OF CLEANING OPERATION

- A. Acceptance of sanitary sewer and storm water pipe and structure cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the City. If television inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to re-clean and re-inspect the sewer line at no additional cost until the cleaning is shown to be satisfactory.
- B. In addition, on all sanitary sewers which have sags or dips, to an extent that the television camera lens becomes submerged during the television inspection, the Contractor shall use a high pressure cleaner to draw the water out of the pipe, or other means, to allow the full circumferential view of the pipe and identification of pipe defects, cracks, holes, and location of service connections.

b.C. _____

PART 6 - METHOD OF MEASUREMENT AND PAYMENT

4.01 Measurement and payment for Unit Price Schedule line items LC, MC, HC 5 through 11 will be based on the measured length from the centerline of the exit to the centerline of the entry manhole. Exception, where cleaning can not proceed from the exit to the entry manhole due to sewer main conditions and must be continued from the opposite end of the main the length will be the sum from the exit manholes to the condition preventing continuous cleaning of the entire segment.


iii)

iv) END OF SECTION

REVISED SECTION 02762
TELEVISIONING SANITARY SEWER SYSTEMS

~~PART 6~~—PART 7 - GENERAL

6.017.01 SCOPE OF WORK

- A. The Work covered within this Section is for the internal closed-circuit television (CCTV) inspection of sanitary sewer pipes. The Contractor shall perform sewer-televising work as necessary to thoroughly document the condition of all sewers, service lateral connections, service laterals, and to a minimal extent manhole corbel, barrel and cone-sections in the study area. The sanitary sewer and service laterals shall be carefully inspected to determine alignment, grade variations, separated joints, location and extent of any deterioration, breaks, obstacles, obstructions, debris, quantities of infiltration/inflow and the locations of service connections. 06-08-2020 Conformed 
- B. The quality of all Work specified in this Section shall meet or exceed the requirements of the National Association of Sewer Service Companies (NASSCO) Recommended Specifications for Sewer Collection System Rehabilitation (latest edition), except as described in this Section. Applicable portions of this Section that inadvertently fall below those standards shall be corrected and maintained at the NASSCO standards as a minimum requirement, at no additional cost to the City.

6.027.02 REQUIREMENTS

- A. The Contractor shall inspect the sewer interior using a color closed circuit television camera (CCTV) and document the inspection on a digital recorder. All inspection video shall be captured in either MPEG or Windows Media Video (.WMV) file format and saved portable hard drives for submittal. Each inspected main line sewer segment referenced manhole to manhole, manhole to inlet, inlet to inlet, inlet or manhole to outfall, and each inspected sewer lateral referenced to the property address and corresponding sewer main should have an associated MPEG or WMV file. Digital photographs (.JPG files), inspection reports (.PDF files) and any handwritten inspection logs or field maps shall accompany the video inspections for each sewer reach (manhole-to-manhole) or lateral inspected.
- B. Contractor shall provide inspection video, data and reports in accordance with the requirements specified herein. Contractor shall provide all video on portable hard drive as specified. All Work will conform to current NASSCO Pipeline Assessment Certification Program (PACP) coding conventions and all software used by the Contractor will be PACP compliant. An electronic database will be provided by the Contractor in a PACP exported format approved by the City.
- C. The Contractor shall provide comments as necessary to fully describe the existing condition of the sewer on the inspection forms.

- D. Contractor shall be responsible for modifications to equipment and/or inspection procedures to achieve report material of acceptable quality.
- E. No Work shall commence prior to approval of the submitted material by the City. Once accepted, the report material shall serve as a standard for the remaining Work.
- F. Site to be restored to pre-inspection conditions.
- G. Contractor shall ensure that employee's vehicles display company logo on side doors and company phone numbers. No personal vehicles are to park at the job site.
- H. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

6.037.03 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

6.047.04 QUALIFICATIONS AND QUALITY

- A. Refer to Section 01101 General Work Requirements paragraph 1.01.A minimum CCTV work qualifications.

6.057.05 SUBMITTALS

- A. Submittals shall be provided to the City for review and acceptance prior to construction as listed and described in the individual General Requirements and Technical Specification sections. Work performed for which a submittal or shop drawing is required that has not been reviewed by the City or responsible agencies shall be considered installed at the Contractor's risk.
- B. Submittals associated with this section submitted under another Section.
 - 1. Refer to Section 01516 for by-pass pumping plan submittal.
 - 2. Refer to Section 02761 for SDS submittal.
 - 3. Work schedule refer to Section 02761, Cleaning Sanitary Systems, and article 1.05 for requirements.
 - 4. Maintenance of Traffic is covered in General Requirements Section 01570.
 - 5. Refer to Section 01101 paragraph 1.03 for CCTV video sample requirement.
- C. Submittals under this section.
 - 1. PACP certificate copies of all operators.
 - 2. Footage calibration report for each camera used.
 - 3. Work schedule refer to Section 02761, Cleaning Sanitary and Storm Sewer Systems, and article 1.05 for requirements.
 - 4. Maintenance of Traffic is covered in General Requirements Section 01570.
- D. The following deliverables shall be submitted on a portable hard drive at the completion of

inspection:

1. Sanitary sewer main and lateral pre- and post- work inspection videos saved in MPEG format or Windows Media video format
 2. Electronic version (.pdf) of the pipe inspection reports
 3. PACP export pipe inspection database (.mdb)
 4. Inspection digital photographs in JPEG format
 5. Map of sub area depicting area inspected, inspection status, asset identification numbers and mark ups
 6. QA/QC report.
 7. Main and Lateral defect repair recommendations for each pipe segment.
- E. The above deliverables shall be submitted monthly, or shorter frequency depending on the duration of the work order, to the City for approval. Application for payment shall be made after review and approval by the City.
- F. The sewer inspection video, report documents, and sewer inspection database shall be in accordance with City data standards and NASSCO PACP.

6.067.06 NOTIFICATION

- A. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained that the business is open. No sewage from the services or main line shall be discharged on the ground or in waterways.

PART 7 - PART 8 - PRODUCTS

7.018.01 EQUIPMENT

- A. Closed Circuit Television Camera: The television camera used for the inspection shall be one specifically designed and constructed for sanitary sewer inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100 % humidity/submerged conditions. The CCTV camera equipment will provide a view of the pipe ahead of the equipment and of features to the side of the equipment through turning and rotation of the lens. The camera shall be capable of tilting at right angles along the axis of the pipe while panning the camera lens through a full circle about the circumference of the pipe. The lights on the camera shall also be capable of panning 90° (degrees) to the axis of the pipe.
- B. The radial view camera must be solid-state color and have remote control of the rotational lens. The camera shall be capable of viewing the complete circumference of the pipe and manhole structure, including the cone-section or corbel. Cameras incorporating mirrors for viewing sides or using exposed rotating heads are not acceptable. The camera lens shall be an auto-iris type with remote controlled manual override.
- C. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment.

The camera unit shall have sufficient quantities of line and video cable to inspect 2 complete, consecutive sewer reaches with access approximately 750-feet apart.

- D. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the City. The television camera, electronic systems and monitor shall provide an image that meets the following specifications, or approved equal:
1. The gray scale shall show equal changes in brightness ranging from black to white with a minimum of five stages.
 2. With the monitor control correctly adjusted, the 6-colors; Yellow, Cyan, Green, Magenta, Red, and Blue, plus black and white shall be clearly resolved with the primary colors in order of decreasing luminance. The gray scale shall appear in contrasting shades of gray with no color tint.
 3. The picture shall show no convergence or divergence over the whole of the picture. The monitor shall be at least 13-inches diagonally across the picture tube.
 4. The live picture on the CCTV monitor shall be capable of registering a minimum of 500 lines horizontal resolution and be a clear, stable image with no interference.
 5. Lighting intensity shall be remote controlled and shall be adjusted to minimize reflective glare. Lighting and camera quality shall provide a clear in-focus picture of the entire inside periphery of the sewers and laterals for all conditions except submergence. Under ideal conditions (no fog in the sewer) the camera lighting shall allow a clear picture up to 5 pipe diameter lengths away for the entire periphery of the sewer. The lighting shall provide uniform light free from shadows or hot spots.
 6. The camera light head shall include a high-intensity side viewing lighting system to allow illumination of internal sections of lateral sewer connections.
 7. Camera focal distance shall be remotely adjustable through a range of 6-inches to infinity.
 8. Picture quality and definition shall be to the satisfaction of the City.
 9. The monitor and software shall also be able to capture and save screen images of typical sewer details and all defects. Screen images shall be embedded into the pipe inspection report document submitted with the inspection video.
 10. The video camera shall be capable of displaying on screen data as specified in paragraph 3.08 herein.
 11. Depth gage: The camera shall have a depth gage or approved method to measure deflection in the pipe and joint separation approved by the City. The camera shall have zoom capabilities to be able to view the entire depth of a 20-foot deep manhole from the bottom during inspection.
 12. The camera lens shall be kept clear of condensation and debris during the CCTV inspection.
 13. Camera equipment must have independent lab approval for use in Class 1, Group 0 Hazardous locations per NFPA.
- E. Lateral Video Camera
1. Refer to Technical Specification Section 02763, Television Sanitary Sewer Laterals, article 1.04 for equipment requirements.
 2. Lateral cameras may be push type or launched from the sewer main line. Lateral cameras shall be color, shall be self-leveling, and equipped with a footage counter to provide on-

screen display of footage measurement. Monitor resolution shall be as in accordance with paragraph 1.04 of Section 02763 or approved equal

F. Video Capture System

1. The video and audio recordings of the sewer inspections shall be made using digital video equipment. A video enhancer may be used in conjunction with, but not in lieu of, the required equipment. The digital recording equipment shall capture sewer inspection on hard drive, with each sewer reach inspection recorded as an individual movie file (.MPEG, .MPG, or .WMV) or approved equal. The video files will be named in accordance with the City file naming convention contained in paragraph 3.11 herein.
2. The video file names will be referenced in the inspection database and in an inspection report generated in PDF format. The pipeline collection and real time video capture and data acquisition systems shall be provided.
3. The system shall use the most current PACP compliant application software and shall be fully object oriented or approved equal. It shall be capable of printing pipeline inspection reports with captured images of defects or other related significant visual information on a standard color printer.
4. The imaging capture system shall store digitized color picture images and be saved in digital format on a hard drive or approved equal. Also, this system shall have the capability to supply the City with inspection data reports for each line segment.
5. The Contractor shall have the ability to store the compressed video files in industry standard and approved City format and be transferable with the PACP compliant inspection database.
6. The Contractor's equipment shall have the ability to "Link". "Linking" is defined as storing the video time frame code with each observation or defect with the ability to navigate from/to any previously recorded observation or defect instantaneously.
7. The system shall be able to produce data reports to include, at a minimum, all observation points and pertinent data. All data reports shall match the defect severity codes in accordance with PACP naming conventions
8. The data-sorting program shall be capable of sorting all data stored using generic sort key and user defined sort fields.
9. Camera footage, date & manhole numbers shall be maintained in real time and shall be displayed on the video monitor as well as the video character generators illuminated footage display at the control console. All manhole references will be based on the Cities Facility ID number.
10. Digital video shall be defined as ISO-MPEG Level 1 (MPEG-1) coding having a resolution of 352 pixels (x) by 240 pixels (y) (minimum) and an encoded frame rate of 29.97 frames per second. The digital recording shall include both audio and video information that accurately reproduces the original picture and sound of the video inspection. The video portion of the digital recording shall be free of electrical interference and shall produce a clear and stable image. The audio portion shall be sufficiently free of background and electrical noise to produce an oral report that is clear and discernible.
11. Inspection software shall be PACP compliant versions of CUES Granite XP, WinCan, Flexidata, or approved equal.
12. The CCTV equipment/software shall be capable of producing digitized images of all sewer line defects, manhole defects, and sewer line service connections in .jpeg format. Contractor shall plan to take digital still images of each defect, construction

features and service connection to clearly depict it. More images may be necessary depending upon the condition of the pipe.

7.028.02 DIGITAL CAMERA FOR REMOTE INSPECTIONS

- A. All manhole photographs required as part of this specification shall be obtained using a minimum 4-megapixel digital camera with strobe flash capable of producing digital images with minimum resolution of 2240 x 1680.

7.038.03 REPORTING CAPABILITIES

- A. The CCTV system shall be capable of printing pipeline inspection reports with pipeline schematics and captured images of defects and other related significant visual information. The system shall have the ability to display any combination of the following formats and features simultaneously.
- B. The following information is mandatory for all inspections:
1. Inspection Information: Refers to the area of pipe to be inspected between 2 manholes or the address of the lateral to be inspected.
 1. Project Name
 2. Surveyed by (Operator/Surveyor's name)
 3. Operator/Surveyor Certificate number
 4. System Owner
 5. Date
 6. Main segment number. Segment numbers will be provided with each proposal request.
 7. Drainage Area (tributary pump station number)
 8. Time
 9. Sheet number (report sheet number)
 10. Street Name and Number
 11. Locality (City of St. Augustine (COSA))
 12. Additional Location Information (e.g. backyard, parking lot, etc.)
 13. Upstream Manhole Number (City standard Facility ID Number)
 14. Upstream MH rim to invert (depth)
 15. Downstream Manhole Number (City standard Facility ID Number)
 16. Downstream MH rim to invert (depth)
 17. Direction of inspection (Upstream or Downstream)
 18. Flow control (e.g. plugged, lift station, bypassed, not controlled)
 19. Type of Pipe
 20. Pipe Height
 21. Pipe Width
 22. Pipe Shape
 23. Pipe Material
 24. Lining Material (for lined sewers)
 25. Pipe Joint Length
 26. Purpose of Inspection (Condition evaluation, new line, CIP R/R project, etc.)
 27. Pre-Cleaning (jetter, heavy cleaning, no pre-cleaning)
 28. Media Number (Video file name)
 29. Weather

30. Additional information/Comments

2. Observation Data: Refers to the portion of pipe where an observation is discovered. Observations shall be noted by text descriptions and defect code number using PACP defects codes, still frame pictures and video clips captured and recorded. Each observation shall include the following:

1. Actual observation footage
2. Video reference
3. Location of defect; clock position
4. Code (Group/Descriptor/Modifier/Severity)
5. Whether it is a continuous defect
6. Whether the defect occurs at a joint
7. Severity level
8. video counter location
9. Final footage
10. Video clip ID for each observation
11. Image reference (file name of photos)
12. Remarks (as appropriate or needed)

3. Formats: Standard and/or custom designed reports shall have the following formats available and shall be able to be produced in hard copy or viewed on the monitor.

1. Site Observation: Displays detailed site observation reports in landscape or portrait views.
2. Directory Report: Displays a list of all the projects sorted by pump station number and manhole number.
3. Picture Reports: Displays site data and include full size single photos or half size double photos of discrepancies.
4. Pipe Run: Displays a graphical display of the site indicating footage, observations, and comments.
5. Project Data: Displays the project, client, and Contractor information.
6. Custom Sort: Creates user-defined reports of selected site, project, and observation data.

PART 8—PART 9 - EXECUTION**8.019.01** GENERAL

- A. Work notices are to be provided to property owners 48 hours prior to beginning work. A copy of the notices will also be provided to the City at the time they are provided to property owners.
- B. Prior to inspection the Contractor shall obtain pipe and manhole asset identification numbers from the City to be used during inspections. Inspections performed using identification numbers other than the City assigned numbers will be rejected.
- C. Inspection shall not commence until the sewer section to be televised has been completely cleaned in conformance with Specification Section 02761 "Cleaning Sanitary Sewer Systems."
- D. Inspection of newly installed sewers (not yet in service) shall not begin prior to completion of the following:

1. Pipe air testing
 2. All manhole work, including installation of inverts
 3. Installation of all lateral services
 4. Vacuum tests of all manholes
- E. After the sewer main and/or lateral cleaning operation is completed, the line sections shall be visually inspected internally by means of color closed-circuit television. The television inspection shall be performed one-line segment at time.
- F. CCTV inspection shall require a minimum of 1 certified personnel with PACP certifications.
1. One (1) person shall have PACP certification that will lead or supervise each field CCTV crew for inspection and a minimum of 2-years in the role of a lead person.
 2. This person shall also have experience in the role as a QA/QC management supervisor
- G. Contractor shall perform sewer-televising work within 24-hours of said sewer being cleaned. If said sewer is not televised within the required 24-hour time limit, the sewer shall be re-cleaned prior to televising at no additional expense to the County.
- H. The Contractor shall also inspect and document all manholes included in this Work. The video recording shall begin as the camera is lowered down the manhole all the way to the preset footage and continuously throughout the pipe reach until the downstream manhole is reached.
- I. The Contractor shall lower the camera into the start manhole and record the camera entry into the sewer, observing the manhole as the camera enters.
- J. Main diameter is to be physically measured in the up or downstream manhole and documentation of this is to be included in the CCTV video record.
- K. The camera shall pan the periphery of the start and finish manhole from casting to invert. To achieve this, the CCTV camera operator shall pan and zoom the manhole to obtain the best possible image of the manhole, including the wall, cone and chimney section(s).
- L. The depth of each manhole shall be measured to the nearest 1/10th of a foot and documented on the inspection forms. Estimates of manhole depths will not be accepted.
- M. The CCTV camera shall be positioned as close to the spring line as possible while maintaining the required equipment stability.
- N. Wherever possible the inspections shall be performed in the upstream to downstream direction. All sewer segments shall be recorded in a logical order in the same direction they are cleaned and televised.
- O. If access to some manholes is restricted, permission may be granted by the City to direct the camera through the sewer in an upstream direction, against the flow.
- P. When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and Contractor shall televise the line from the opposite direction.

- Q. The camera shall be directed through the sewer in a downstream direction, with the flow, at a uniform, slow rate. In no case will the video camera record while moving at a speed greater than 30-feet per minute. If, during the Project, the inspection is rejected due to camera speeds exceeding 30-feet per minute, the inspection recordings shall be redone, at no additional cost to the City.
- R. If a new manhole is discovered in the field that was not on current maps, a new manhole identification number will be assigned by City. The City shall assign the manhole the next number above the highest manhole number within the sub area. The data / video files shall then be re-named to include the new MH ID, and a new CCTV inspection shall be started from the new MH ID. Contractor shall consult with the City for assignment of new manhole identification numbers. Contractor shall note in the inspection form comments that a new manhole ID has been assigned as well as provide a marked-up map indicating the newly found manhole and assigned manhole ID.
- S. Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the Work during low flow periods or other methods like plugging and bypass pumping shall be implemented.
- T. For inspection of new sewers (not yet in service), the Contractor shall introduce clean water into the upstream manhole and keep water flowing until flow is observed at the downstream manhole location.
- U. The survey unit shall be slowed, stopped, or backed up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe. Recording shall document broken sections, root intrusion, miss-aligned joints and other defects for a minimum of 5 seconds.
- V. The camera unit shall be paused long enough at areas suspected of leaking to determine if a leak exists currently or if deposits have occurred.
- W. The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data.
- X. Digital photographs or screen captures shall be taken at all laterals; defects and general condition photographs shall be taken at least every 200-feet.
- Y. At the Contractor's discretion or direction of the City, the camera shall be stopped or backed up (when conditions allow) to view and analyze conditions that appear to be unusual or uncommon for a sound sewer. The lens and lighting shall be readjusted, if need be, in order to ensure a clear, distinct, and properly lighted feature.
- Z. Audio shall be recorded during each inspection by the operating technician, electronic voice text recognition or approved equal on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are

encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. Voice descriptions should be made:

1. At points of pipe failure or weakness
2. At points of infiltration
3. At the location of service connections
4. At points where unusual conditions are noted, and
5. At points where digital still photos are taken.

AA. In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio dubbing after the inspection is prohibited.

BB. Video recordings shall include a continuous video display/readout of similar information, as described in paragraph 3.08 herein. A separate digital video file shall be made for each pipe reach inspected. To the extent practical there should be one video recording per segment. Multiple videos will only be accepted when pipe condition along the entire length of segment requires extensive defect documentation.

CC. Contractor shall coordinate with the City prior to commencement of Work to ensure inspection is accomplished in a manner acceptable to the City.

DD. If the video and/or audio recording is of poor quality, the City has the right to require a re-submittal of the affected sewer sections and no payment will be made until an acceptable video and audio recording is made, submitted to, and accepted by the County.

EE. Measurement for location of defects and actual length of pipe shall be by means of a calibrated meter on the camera with a digital readout on the video monitor. This readout shall be included in the video recording. Marking on cable, or the like, which would require interpolation for depth of manhole, in general, will not be allowed. Where the entry manhole ID will not allow the camera and trailer to fit without entering the main to begin the inspection. A two (2) foot mark will be allowed. This marking will need to be reported in the associated segment PACP inspection report. Measurement will be accurate to 1-foot per 100-feet of inspected pipe.

FF. The distance shall be measured between the exit of the start manhole and the entrance of the finish manhole for a true measurement of the length of the pipe segment, as required by PACP. It shall be recorded in standard units and the video display readout shall display units to one-tenth of a foot.

GG. The Contractor inspection units shall be equipped with adequate back up equipment and spare parts so field repairs to equipment can be made and down time is minimized.

HH. The Contractor shall be responsible for all traffic control measures required to perform the Work.

- II. Lateral inspections shall be performed from the main line using a lateral launch camera or shall be pushed from cleanouts to the sewer main using sewer rods. Lateral camera travel measurements shall be displayed on screen and on the captured video.
- JJ. If lateral inspections are performed from the sewer main as part of the main line inspection, the lateral shall be logged in the main line inspection report per PACP requirements and the "comment" field of the main line inspection report shall be used to document the lateral identification number, defects observed, footage of all lateral defects, connecting pipes and clean outs. If lateral inspections are not performed as part of the main sewer inspection, a separate PACP pipe inspection record shall be created for each lateral. Refer to paragraph 3.10 for numbering requirements.

8.029.02 QUALITY ASSURANCE

- A. Refer to Section 01101 article 3.03 and 304 for quality assurance and inspection requirements.

8.039.03 PRE-CONSTRUCTION INSPECTION

A. Procedure

1. Prior to any repair work, the entire sewer line (from manhole to manhole) shall be televised. The pre-construction inspection shall be used to determine whether the line has been cleaned sufficiently; to confirm the location and nature of defects; and to confirm that the proposed method of repair is proper method for the defects observed.
2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30-feet per minute. Manual winches, power winches, TV cable, and power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole (reverse set-up).
3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the 2 manholes of the section being inspected to insure good communication between members of the crew.
4. The importance of accurate distance measurements is emphasized. The location of defects shall be within ± 1 feet.
5. During the internal inspection the television camera shall be temporarily stopped at each defect along the line. The Contractor shall record the nature and location of the defect. Where defects are also active infiltration sources, the rate of infiltration in gallons per minute shall be estimated by the Contractor and recorded. The camera shall also be stopped at active service connections where flow is discharging. Flows from service connections that are determined to be infiltration/inflow shall also be recorded.
6. Suspect Lateral Connections to Mainline.
 1. Pan and tilt all service lateral connections to the mainline. Locate clean-out by property line, and if found record the addresses. Identify service connection locations,

- e.g. left, right, crown, and record lateral distances from the entry manhole in the mainline.
2. Used the Pan and Tilt camera to inspect each service lateral connection and document and visible service connection defects from mainline.
3. Check for flow in each service lateral connection. If flow is detected in the service lateral connection, follow steps d. to h. If no flow is detected in the service lateral proceed to the next service lateral survey.
4. Wait 3 to 5 minutes.
5. If flow is clear and does not subside, follow steps f to i. If flow subsides or is murky proceed to step g.
6. Check the water meter. If meter is running, proceed to step g. If the meter is not running proceed to step h.
7. Domestic Flow – Calculate flow from water meter reading and make entry in CCTV Video log.
8. Suspect Service Lateral – Estimate flow, make entry in the CCTV video log.
9. Continue mainline inspection.

B. Documentation of Television Inspection

1. Television Inspection Logs: Printed location records shall be kept by the Contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as locations of building sewers, unusual conditions, roots, storm sewer connections, broken pipe, presence of scale and corrosion, and other discernible features will be recorded, and a copy of such records will be supplied to the City. The Contractor shall record all visual observations on a "Television Inspection Report" form.
2. Once recorded, the digital data shall be labeled and become the property of the City. The Contractor shall have all readings and necessary playback equipment readily accessible for review by the City during the Project.

8.049.04 POST CONSTRUCTION INSPECTION

A. Procedure

1. After the sewer line rehabilitation has been completed, the entire sewer line from manhole to manhole shall be televised. The post construction inspection shall be used to determine whether all the approved sewer line defects and infiltration sources previously located have been fully repaired to the satisfaction of the City.
2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30-feet per minute. Manual winches, power winches, TV cable, power rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the entire manhole section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole or direction. (reverse setup)
3. When manually operated winches are used to pull the television camera through the line, telephones, radios or other suitable means of communication shall be set up between the 2 manholes of the section being inspected to insure good communication

- between members of the crew.
4. The importance of accurate distance measurements is emphasized. The location of defects shall be within 1-foot.
 5. During the internal inspection the television camera shall be temporarily stopped at each repair. The camera shall also be stopped at any unnoticed or non-repaired point source of infiltration.

8.059.05 SEWER BYPASSING AND DEWATERING

- A. Refer to General Requirement Section 01516, Collection System Bypass, article 1.01 Scope of Work for sewer bypass requirements.

8.069.06 LINEAR MEASUREMENT

- A. The CCTV camera location footage counter shall be zeroed at the beginning of each inspection. The survey unit location entered on the footage counter at the start of the inspection shall allow for the distance from the accepted start of the length of the sewer to the initial point of observation of the camera (pre-set footage) as described in article 3.01.EE of this specification. In the case of resuming an inspection at an intermediate point within a sewer reach, the footage counter shall be set to start at the distance from the upstream maintenance hole to that point, as previously recorded by the counter. The Contractor shall ensure that the footage counter starts to register immediately when the survey unit starts to move.
- B. The lateral camera shall be pushed from cleanouts to the sewer main and be equipped with a footage counter to display and record inspection footage. Maximum rate of travel shall be 30-feet per minute when recording.
- C. Prior to commencing inspections, the Contractor shall demonstrate compliance with the linear measurement tolerance specified below:
 - A. The equipment shall measure the location of the camera unit in 1-foot increments from the beginning (upstream end) of each continuous section. This footage location must be displayed on the CCTV monitor and recorded on the videotapes.
 - B. The accuracy of the measured location shall ~~be within + 0.5% of the actual length of the sewer reach being surveyed, or 1 foot, whichever is greater.~~ meet the accuracy requirement described in article 3.01.EE of this specification.

8.079.07 MEASUREMENT OF SAGS

- A. The CCTV camera shall be equipped with a measuring device capable of accurately measuring the depth of standing water up to 3-inches. The measuring device shall be mounted to the front of the unit and be capable of being read as the unit advances through the pipe.

8.089.08 CCTV MONITOR DISPLAY

- A. The images displayed on the CCTV monitors will be a view of the pipe above the water surface as seen by the CCTV camera as the unit is conveyed through the sewer.
- B. The camera lighting shall be fixed in intensity prior to commencing the survey and the white balance set to the color temperature emitted. In order to ensure color constancy, no variation in illumination shall take place during the survey.
- C. The video equipment shall be checked using an approved test card with a color bar prior to commencing each day's survey. The camera shall be positioned centrally and parallel to the test card at a distance where the full test card just fills the monitor screen. The card shall be illuminated evenly and uniformly without any reflection.

8.099.09 DATA DISPLAYS

- A. The CCTV images shall include an initial data display that identifies the sewer reach being surveyed and a survey status display that provides continuously updated information on the location of the survey unit as the survey is being performed. These data displays shall be in alphanumeric form. The size and position of the data shall not interfere with the main subject of the monitor picture.
- B. The on-screen display should be white during inspections where the background behind the display is dark and, conversely, black where the background is light.
- C. At the beginning of each reach of sewer being inspected, the following information shall be electronically generated and displayed on the CCTV monitors as well as included in the audio track:
 - 1. Date of survey
 - 2. Inspection company name and inspector
 - 3. Street name or location
 - 4. Manhole number to manhole number (in order of inspection)
 - 5. Direction of survey (upstream or downstream)
 - 6. Time of start of survey
- D. During inspections, the following information shall be electronically generated, automatically updated, and displayed on the CCTV monitors:
 - 1. Survey unit location in the sewer line in feet and tenths of feet from adjusted zero
 - 2. Sewer diameter
 - 3. Upstream and downstream manholes reference numbers as per approved Drawings or City GIS.
 - 4. During Lateral inspections the video display shall contain the lateral location and the footage of the camera within the lateral.

8.109.10 PHOTOGRAPHS

- A. During CCTV inspections, screen captures will be taken from the monitor images and saved electronically by the in-sewer inspection crew of typical conditions every 200-feet and at all

defects, construction features, manholes and laterals. The screen capture shall have the pipe reach (identified by the upstream and downstream manholes), survey direction, footage, and date when photograph was taken. The annotation shall be clearly visible and in contrast to its background, shall have a figure size no greater than 1/4-inch, and shall be type-printed. The annotation shall be positioned on the front of the photograph to not interfere with the subject of the photograph. Photograph files shall be named by the video capture system and automatically referenced to the logged defect.

- B. The image of the sewer shall fill the photographic image. Photographs must clearly and accurately show what is displayed on the monitor, which shall be in proper adjustment. Where significant features exist within 6-feet of each other, 1 photograph shall be made to record these features. Where there is a continuous feature, photographs shall not be taken at intervals of less than 6-feet unless necessary to show a change in the feature.
- C. JPEG images shall be captured at a minimum resolution of 1024X768 pixels.
- D. The images shall be kept electronically, copied to a hard drive, and submitted with the inspection videos, database and reports.

8.119.11 MANHOLE NUMBERING, INSPECTION FORMS AND DEFECT CODES

- A. The Contractor will be required to use the manhole numbering as shown on sewer maps provided by the City when performing the inspections for this project. These numbers are based on the Facility ID the City maintains in their graphics database.
- B. Inspection forms, defect codes, inspection database and inspection protocols used for documentation of CCTV work shall be in accordance with the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).
- C. When lateral inspections are performed as part of the main sewer inspection, lateral numbers shall be referenced in the "comment" field of the main sewer PACP report. The lateral number shall be as follows:

< Manhole ID> __<footage> __<clock position> __<L>

Example: 39550020_212_02_L

- D. When lateral inspections are not performed as part of the main sewer inspection, the main sewer inspection shall be performed first to obtain the footage and clock positions needed to identify the lateral.

8.129.12 DELIVERABLES

- A. The Contractor will be required to submit the following deliverables at the completion of the post construction video inspection. The pre-construction video inspection deliverables shall be as defined in 3.03 of this specification.
- B. Inspection Reports to include:
 - 1. Inspection session header information (see required fields above)

2. Defect log report including photo captures from CCTV video
3. Schematic drawing of pipe showing defects
4. Format:
 1. Adobe Acrobat PDF files: 1 report PDF per pipe
 2. Main sewer inspection report file name:

<From MH ID>_<To MH ID>_<Date (year_mo_day format)>.PDF

Example: 30060002_30060001_2018_01_16.pdf

3. Lateral inspection report file name:

<Upstream MH ID>_<footage>_<clock position>_<L>_<Date (year_mo_day format)>.PDF_

Example: 30060002_210_02_L_2010_02_16.pdf

- C. Inspection video files on portable hard drive, typed labels shall be attached to the face of each hard drive. The typed index labels shall include the following information:
 1. Content (CCTV)
 2. Contractor name
 3. Purpose of Survey
 4. Tributary Pump station number
 5. Reaches included (from Manhole Number ## to Manhole Number ##)
 6. Date of survey
 7. Contract Number / Delivery Order Number (if applicable)

- D. Main sewer video files shall be MPEG or Windows Media File named according to the following standard:

<Upstream MH ID>_<Downstream MH ID>-<Inspection>_<Date (year month day)>.wmv

Example: 39540008-39540007_20090805.wmv

- E. In instances where a reverse set up is necessary to perform or complete the inspection the file name shall incorporate a "R" at the end of the file name to indicate "reverse" direction. Using the file example above, if the inspection from the upstream end was halted due to an obstruction and the pipe was televised from the opposite end, the video file from the downstream to upstream direction would be assigned the following file name:

Example: 39540008-39540007_20090805_R.wmv

- F. Lateral connection inspection video files shall be MPEG or Windows Media File named according to the following standard:

<Upstream MH ID>_<footage>_<clock position>_<L>_<date (year_mo_day format)>.wmv

Example: 39540008_145_10_L_2009_08_05.wmv

- G. Electronic Inspection Data stored and exported in a NASSCO Pipeline Assessment and Certification Program (PACP) compliant Microsoft Access database (.MDB) version 4.4 or newer delivered on portable hard drive.

- H. Inspection photograph digital files (jpeg) indexed to NASSCO PACP compliant database.
- I. Map of sub area depicting area inspected, inspection status, asset identification numbers and mark ups,
- J. Acceptable media for the video recordings portable hard drive.
- K. Inspection data noted above shall be provided to the City weekly throughout the inspection work.
- L. Contractor Quality Control report detailing data validation performed, pipe inspection records reviewed and results.
- M. All inspection data shall be submitted on a portable hard drive. Each hard drive shall be filled with as much data as practical to minimize the number of hard drives submitted. Sections of a single segment of sewer main shall not be recorded to more than 1 hard drive. Video footage of recorded segments shall be grouped by area and shall be submitted in sequential order relating to the area mapping designation.
- N. Upon approval by the City of all, or portions of, the data delivered via the portable hard drives, the approved CCTV data shall be delivered to the City on a portable hard drive labeled with project information. The hard drive shall clearly indicate the date of the inspection, the designated segment(s) of sewer mains(s) contained on the disk, the name of the project, the project CIP number, the pump station number, and Contractor name. The hard drive shall contain separate digital files for each manhole-to-manhole section.
- O. The database shall be comprehensive for the entire project, and additional data shall be added to the database each week.

8.139.13 ACCEPTANCE

- A. Inspection deliverables will be validated to check conformance with the specified requirements for file names, formats, quantity, and resolution, data table references, in addition to checks for null fields, asset numbers, duplicate records, connectivity, material, size, and depth. Any data not passing the data validation checks will be returned to the Contractor for resubmittal.
- B. Inspection submittals will be reviewed for quality control. A minimum of 5% of the submitted inspections will be randomly reviewed. A quality control check will be performed for each CCTV operator and each operator must exceed 90% accuracy. Reference Section 01101 "Special Requirements (Gravity Inspection Only)."
- C. Throughout the duration of the project, should the City discover inaccuracies in data or quality issues with any of the videos, Contractor shall re-inspect those segments at no additional cost to the City. The City will provide comments regarding acceptance of the data within 21-days of receiving the data from the Contractor. Neither the CCTV inspections nor the WORK inspected is accepted by the City until such time that an acceptance letter is issued by the City.

PART 10 - PART 4 – METHOD OF MEASUREMENT AND PAYMENT

4.01 Measurement and payment for Unit Price Schedule line items TV5 through TV11 will be based on the length of main inspected from the inside face of the wall of the exit manhole to the termination of the main at inside face of the wall of the entry manhole. An exception, where the inspection is terminated due to the sewer main conditions and then continued from the opposite end of the main the length will be the sum of the measurements from both exit manholes to the condition preventing the camera from passing continuously through the segment.

END OF SECTION

REVISED SECTION 02771
CURE-IN-PLACE PIPE FOR SANITARY SEWER RENEWAL

PART 9 - PART 11 - GENERAL

9.0111.01 REQUIREMENTS

- A. The Work within this Section consists of the installation and testing cured-in-place pipe (CIPP). The CIPP shall provide a structurally sound, joint-less and water-tight new pipe within a pipe. The Contractor is responsible for proper, accurate and complete installation of the CIPP using the system selected by the Contractor.
- B. The finished liner shall extend over the installation length in a continuous, tight fitting, watertight pipe-within-a-pipe and shall be fabricated from materials which, when installed, will be chemically resistant to withstand internal exposure to domestic sewage.
- C. Neither the CIPP system, nor its installation, shall cause adverse effects to any of the City's facilities or processes. The use of the product shall not result in the formation or production of any detrimental compounds or by-products at the treatment facilities. The Contractor shall test and monitor the levels of by-products produced as a result of the installation operations. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses, and property owners or tenants.
- D. All contractors and employees' vehicles on the project site for the City shall clearly and boldly display their full name, address, and phone number.
- E. Maintenance of Traffic (MOT)
Refer to General Requirements Section 01570, Maintenance of Traffic requirements.


9.0211.02 INSTALLER EXPERIENCE AND QUALIFICATIONS

- A. Refer to Section 01001 General Work Requirements paragraph 1.02.B for minimum lining work experience. 06-08-2020 Conformed



9.0311.03 PERFORMANCE WORK STATEMENT

- A. The Contractor shall submit, before any lining WORK is performed, to the City a Performance Work Statement (PWS) which clearly defines the CIPP product delivery in conformance with the requirements of these contract documents. The PWS shall contain at a minimum the following:
 - 1. Contractor's certificate of compliance that clearly indicates that the CIPP will conform to the project requirements as outlined in Specification Section 01010 Summary of Work and as delineated in these specifications.

2. A detailed installation plan describing:
 1. All preparation work (cleaning operations, pre-CCTV inspections, by-pass pumping, and traffic control)
 2. Liner wet-out procedure. 06-08-2020 Conformed 
 3. Installation procedure, medium and method of curing. 06-08-2020 Conformed
 4. Service reconnection
 5. Quality control and testing to be performed
 6. Post-CCTV inspection
 7. Warrantees
 8. Description of the proposed CIPP lining technology.
3. A detailed plan for identifying all active service connections during mainline installation.
4. The qualifications of the Contractor.
 1. Name, business address and telephone number
 2. Personnel names, experience, and certifications for Field Superintendent, CIPP lead Installer, Lateral Cutter, Boiler Technician, and Lead CCTV NASSCO PACP Certificated Inspector to be directly involved with this project. The Contractor shall sign and date the information provided and "certify that to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this project". Substitutions of personnel and/or methods will not be allowed without written authorization of the City.
 3. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the City/Professional.
5. Proposed manufacturer's technology data shall be submitted for all CIPP products and all associated technologies to be furnished.
6. All tools and equipment required for a complete installation of the CIPP.
 1. Clearly describe all equipment including proposed back-up equipment to be furnished for this project.
 2. Identify redundant tools and equipment to be kept on the job site in the event of equipment breakdown.
 3. The Contractor shall outline the mitigation procedure to be implemented in the event of key equipment failure during the installation process for the CIPP.
7. A detailed description of the Contractor's proposed procedures for the removal of any existing blockages in the pipeline that may be encountered during the cleaning process.
8. Detailed public notification plan for stage notification to residences affected by the CIPP installation.
9. An odor control plan that will ensure that project specific odors will be minimized at the project site and surrounding area.
10. Outline specific repair or replacement procedures for potential defects that may occur in the installed CIPP. Repair or replacement procedures shall be as recommended by the CIPP system manufacturer and shall be submitted prior to any Work.
 1. Repairable defects that may occur in the installed CIPP shall be specifically defined by the Contractor based on the manufacturer's recommendations, including a detailed step-by-step repair procedure, resulting in a finished product meeting the requirements of the specifications.
 2. Un-repairable defects that may occur to the CIPP shall be clearly defined by the Contractor based on the manufacturer's recommendations, including a recommended procedure for the removal and replacement of the CIPP.

9.0411.04 REFERENCES

A. Codes, Specifications, and Standards

1. Codes, specifications, and standards referred to by number or title shall form a part of this specification to the extent required by the references thereto. Latest revisions shall apply, unless otherwise shown or specified.
2. All American Society for Testing and Materials (ASTM) Standards noted below shall be to the latest revised version.
 - D543 – Standard and Practice for Evaluating the Resistance of Plastics to Chemical Reagents
 - D638 – Standard Test Method for Tensile Properties of Plastics
 - D790 – Standard Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials
 - D792 – Standard Test Methods for Density and Specific Gravity of Plastics by Displacement
 - D2122 – Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
 - D2837 – Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
 - D2990 – Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics
 - D3567 – Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings
 - D3681 – Standard Test Method for Chemical Resistance of “Fiberglass (Glass Fiber Reinforced Thermosetting Resin) Pipe and Fittings
 - D5813 – Standard Specification for Cured-in Place Thermosetting Resin Sewer Pipe
 - F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Inversion and Curing of a Resin-impregnated Tube
 - F1743 – Standard Practice for Rehabilitation of existing pipelines and conduits by pulled-in-place installation of cured-in-place thermo setting resin pipe
 - F2019 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Thermosetting Resin Pipe (CIPP)
 - F2561 - Standard Practice for Rehabilitation of a Sewer Service lateral and Its Connection to the Main Using a One-Piece Main and Lateral Cured-in-Place Liner
 - F2599 – Standard Practice for the Sectional Repair of Damaged Pipe by Means of An Inverted Cured -In-Place Liner

9.0511.05 PRE-TREATMENT OF REGULATED CHEMICALS TO DISCHARGE INTO SEWER

- A. CIPP liner systems using resins containing styrene or other regulated chemicals that will be discharged into the wastewater system shall be required to reduce the concentration of Styrene in the cure water prior to discharge to the sanitary sewer. The discharge limits are as follows:

Discharge Limits		
Total Gallons of Discharge	Maximum Styrene Concentration	Maximum Total Pounds per Day of

Including Water Added for cool down	Limit for Discharge (PPM)	Styrene to be Discharged (Pounds/Day)
< 500,000	7	29
< 250,000	14	29
< 100,000	35	29

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1. A single day's or line segment water discharge in excess of 500,000 gallons per day shall require approval by the City's Environmental Compliance Section for separate concentration limit evaluation and approval."
 2. Discharge concentrations will be reduced based on the collection system distance from the City's Wastewater Treatment plant.
- B. After curing, the Contractor shall obtain a post-treatment cure water sample from the first segment lined in each Work Order and submit for laboratory analysis. 06-08-2020 Conformed
1. The following laboratory analysis is required:
 1. One (1) sample to be collected from the treated water line segment and analyzed for "Styrene" using EPA Method 8260.
 2. One (1) "Trip Blank" sample, analyzed for "Styrene" using EPA Method 8260.
 2. The Contractor shall submit the analytical report to the City for approval.
 3. The Contractor shall be responsible for all costs related to laboratory analytical testing of the water samples collected.
 4. Once the sample results demonstrate that the discharge limits have been met the Contractor shall follow similar styrene reduction procedures for subsequent lining segments, but sampling will not be required. 06-08-2020 Conformed
 5. The City reserves the right to obtain samples at any site on any line segment to ensure compliance with the discharge limits."

~~9.06~~11.06 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

- A. Refer to Section 01001, General Work Requirements paragraph 1.17.i for responsibility for overflows and spills.

~~9.07~~11.07 PROPERTY DAMAGE

- A. Refer to Section 01001, General Work Requirements paragraph 1.07.H regarding property damage.

~~9.08~~11.08 SHOP DRAWINGS AND SUBMITTALS

- A. Submittals shall be submitted to the City for review and acceptance prior to construction in accordance with the General Conditions and specifications Section 01300 "Submittals." Submittals shall include the following:
 1. Performance Work Statement shall be provided with a table of contents and tabbed sections.
 2. Product:

1. A list of projects from the Manufacturer that total a minimum of 500,000 linear feet of liner installed in the United States. An Excel spread sheet shall be included listing as a minimum the name of projects, linear footage of main, completion date, contract amount, name of owner, address, contact person, and phone number.
2. Fabric tube – manufacturer and description of product components
3. Flexible membrane (coating) material and recommended repair (patching) procedure if applicable
4. Raw resin data – manufacturer and description of product components
5. Manufacturer's shipping, storage and handling recommendations for all components of the CIPP system
6. All MSDS sheets for all materials to be furnished.
7. Pre-Liner.
8. Hydrophilic end seals for manhole penetrations.
9. Tube wet-out and cure method including:
 - a. A complete description of the proposed wet-out procedure for the proposed technology
 - b. The manufacturer's recommended cure method for each diameter and thickness of CIPP liner to be installed including the curing medium and the method of application
 - c. Method of cure and means to minimize quantity of styrene discharge back into the wastewater collection system.
 - d. Method to minimize the safety risk to workers and the from exposure to hazardous chemicals associated with CIPP curing process.
3. Quality Control Plan
 1. Defined responsibilities of the Contractor's personnel for assuring that all quality requirements are met. These will be assigned by the Contractor to specific personnel.
 2. Proposed procedures for quality control, product sampling and testing shall be defined and submitted as part of the Plan.
 3. Proposed methods for product performance controls, including the method of and frequency of product sampling and testing both in raw material form and cured product form.
 4. Inspection forms and guidelines for quality control inspections shall be prepared in accordance with the standards specified within this specification.
 5. The manufacturer shall furnish a check list containing key elements of the CIPP installation criteria that is important for the City to ensure that quality control and testing requirements are performed in accordance with these specifications.
4. Engineering design calculations shall be submitted in a timely fashion prior to construction, in accordance with the Appendix of ASTM F-1216, for each length of liner to be installed including the thickness of each proposed CIPP. It will not be acceptable for the Contractor to submit a design for the most severe line condition and apply that design to all the line sections. All calculations shall include data that conforms to the requirements of these specifications.
 1. These calculations shall be performed and certified by a Professional Engineer registered in the State of Florida.
 2. The manufacturer shall certify as to the compliance of its materials to the values used in the calculations.
5. The liner manufacturer shall submit a tabulation of time versus temperature. This tabulation shall show the lengths of time that exposed portions of the liner will endure

without self-initiated cure or other deterioration beginning. This tabulation shall be at 5°F (degrees Fahrenheit) increments ranging from 70°F to 100°F. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner

6. Certified copies of test reports of factory tests required by the applicable standards and this Section.
 7. Manufacturer's installation instructions and procedures.
 8. CIPP Installation Record (Shot Record) to include shot number and corresponding manhole to manhole pipe reaches for each scheduled installation, design thickness, actual thickness delivered to the site, pipe diameter, reach length, total length of shot, and number of laterals.
 9. Wastewater pre-treatment plan including data, measurements, assumptions, calculations and procedures for the pre-treatment of CIPP process wastewater containing regulated chemicals.
 10. Manufacturer's detailed procedures for repairing liners that have been installed incorrectly or that have failed during installation.
 11. Contractor's procedures and materials for service renewal including time and duration of sewer service unavailability and a complete description of the methods he intends to use to reconnect the existing laterals.
 12. Sampling procedures and locations for obtaining representative samples of the finished liner.
 13. Sampling tests for compliance by an independent laboratory shall be made according to the applicable ASTM specification and the manufacturer's quality control program.
- B. A final certificate of compliance with this specification shall be provided by the manufacturer for all lining material furnished.

9.0911.09 WARRANTY

- A. Refer to Section 01001 General Work Requirements paragraph 1.03.A for all warranties covering CIPP work.

9.1011.10 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall be responsible for the delivery, storage, and handling of products. No products shall be shipped to the job site without the approval of the City.
- B. Keep products safe from damage. Promptly remove damaged products from the job site. Replace damaged products with undamaged products.
- C. The wet-out facility shall write the Shot number, total wet-out length, thickness, pipe width, and resin type on each bag delivered to the project.

PART 10 - PART 12 - PRODUCTS

10.0112.01 GENERAL

- A. The materials used shall be designed, manufactured, and intended for sanitary sewer pipe relining and the specific application in which they are used. The materials shall have a proven history of performance in sewer relining and rehabilitation.
- B. Pipe lining products pre-approved by the City include: Insituform Technologies (CIPP Liner), National Liner (CIPP Liner), LMK Enterprises (Performance Liner), Stevens Technologies (CIPP Liner 2 part 100% epoxy), Inner Cure Technologies (Reichhold/Dion CIPP Liner), Lanzo Lining Services (Lanzo CIPP Lining System), and Premier Pipe (Premier Pipe CIPP Lining System), Layne Inliner (CIPP Liner), Service Connection Seal + Lateral Brim & Full Wrap Lateral Liner BLD Services (Main/Lateral Connection Liner) and Miller Pipeline (CIPP Liner). All products must meet the specification herein and will require approval prior to installation. 06-08-2020 Conformed
- C. Pre-Liner:
1. Griffolyn as manufactured by Reef Industries, Inc. or pre-approved equal.
- D. Hydrophilic End Seals by LMK Enterprises or pre-approved equal.
- E. All materials, shipped to the project site, shall be accompanied by test reports certifying that the material conforms to the ASTM listed herein. Materials shall be shipped, stored, and handled in a manner consistent with written recommendations of the CIPP system manufacturer to avoid damage. Damage includes, but is not limited to, gouging, abrasion, flattening, cutting, puncturing, or ultra-violet (UV) degradation. On site storage locations, shall be approved by the City. All damaged materials shall be promptly removed from the project site at the Contractor's expense and disposed of in accordance with all current applicable agency regulations.
- F. The finished pipe liner in place shall be fabricated from materials which when complete are chemically resistant to and will withstand internal exposure to domestic sewage having a pH range of 5 to 11 and temperatures up to 150°F.
- G. Take all necessary field measurements of the existing pipe (including diameter, ovality and length) prior to manufacturing liners.
- H. The minimum length shall be that deemed necessary by the Contractor to effectively span the distance from the inlet to the outlet of the respective manholes unless otherwise specified. The Contractor shall verify the lengths in the field before manufacturing.
- I. Segment liner design will be based on a safety factor of 2, soil modulus of 1000 psi, soil density of 120 pcf, H2O live load, in place depth of cover, groundwater 3 ft. less than the depth of cover, and ovality of 2%.
- J. Point repair liner segments shall not begin or end at a pipe joint.
- K. Point repair section liners shall have a minimum length of 3-ft. Section liners shall extend a minimum of 1-ft. beyond the pipe defects at each end of the repaired section. Length of each required repair shall be verified in the field prior to installation. 06-08-2020 Conformed

- L. All cured-in-place point repairs shall be one piece. Separately fabricated or installed point repairs shall not have butted ends or overlaps.

10.0212.02 STRUCTURAL REQUIREMENTS

- A. Each CIPP shall be designed to withstand internal and/or external loads as dictated by the site and pipe conditions. The CIPP design shall assume no bonding to the original pipe wall.
- B. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long-term, time dependent flexural modulus to be utilized in the product design. The long-term modulus shall not exceed 50 percent of the short-term value for the resin system and shall be verifiable through testing. The materials utilized for the contracted project shall be of a quality equal to or better than the materials used in the long-term test with respect to the initial flexural modulus used in the CIPP design.
- C. The Contractor shall submit, prior to installation of the lining materials, certification of the compliance with these specifications and/or the requirements of the CIPP system. Certified material test results shall be included that confirm that all materials conform to these specifications. Materials not complying with these requirements will be rejected.
- D. The design thickness of the CIPP shall be arrived at using standard engineering methodology as found in ASTM F1216 and the physical properties. In no case shall the finished thickness of the cured liner be less than 4.5 millimeters nominal. The required cured structural CIPP wall thickness shall be based, as a minimum, on the physical properties described in TABLE 02771 - 1 Minimum Physical Properties and per the design of the Professional Engineer and in accordance with the design equations in ASTM F 1216 Appendix X1 and the following design parameters:

Design Considerations	Criteria
Tube Design	ASTM F 1216 Appendix X1
Hydrostatic Buckling	ASTM F 2561 Section 6.1 and 6.1.1
Design Safety Factor	2.0
Retention Factor for Long Term Flexural Modulus to be used in Design	50 % of the short-term value of the resin system
Ovality	2 %
Groundwater Depth*	100% depth from pipe invert to surface
Soil Depth*	As indicated on the plans
Lining enhancement factor (K)	7
Soil Modulus**	1,000 psi
Soil Density**	120 pcf
Live Load**	One (1) H20 passing truck
Design Condition	Fully deteriorated
Minimum Long-Term Life	50 years

*Denotes multiple line segments may require a table of values

**Denotes information required for fully deteriorated design conditions

TABLE 02771-1
Minimum Physical Properties

Property	Standard	Cured Composite per ASTM F1216 (PSI)
Flexural Strength (short term)	ASTM D790	4,500
Flexural Modulus of Elasticity (short term)	ASTM D790	250,000

- E. When multiple layers are present, the layers of the finished CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or such that the knife blade moves freely between the layers. If separation of the layers occurs during testing of the field samples, new samples will be cut from the work. The composite of the materials will, upon installation inside the host pipe, exceed the minimum test standards specified by the American Society for Testing Methods. Any recurrence may be cause for rejection of the work.

10.0312.03 CURED-IN-PLACE LINER

A. Fabric

1. The Contractor shall determine the minimum tube length necessary to effectively span the designated run between manholes. The Contractor shall verify the lengths in the field prior to ordering and prior to impregnation of the tube with resin, to ensure that the tube will have sufficient length to extend the entire length of the run. The Contractor shall also measure the inside diameter of the existing pipelines in the field prior to ordering liner so that the liner can be installed in a tight-fitted condition.
2. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F-1216, ASTM F1743, or ASTM D5813. The tube shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe, and stretch to fit irregular pipe sections.
3. The wet-out tube shall have a relatively uniform thickness that when compressed at installation pressures will equal or exceed the calculated minimum design CIPP wall thickness.

TABLE 3-1
Typical Liner Thickness

SEWER DIAMETER	PIPE INVERT DEPTH UP TO 10'	PIPE INVERT DEPTH UP TO 10-15'	PIPE INVERT DEPTH 15' AND OVER
6"	4.5 mm	4.5 mm	4.5 mm
8"	6.0 mm	6.0 mm	6.0 mm
10"	6.0 mm	6.0 mm	7.5 mm
12"	6.0mm	7.5 mm	9.0 mm
15"	7.5 mm	9.0 mm	10.5 mm
18"	9.0 mm	12.0 mm	13.5 mm
21 "	10.5 mm	13.5 mm	15.0 mm
25"	12.0 mm	15.0 mm	16.5 mm
30"	15.0 mm	18.0 mm	21.0 mm
36"	16.5 mm	21.0 mm	24.0 mm
42"	22.5 mm	24.5 mm	28.5 mm
48"	22.5 mm	28.5 mm	33.0 mm

- 1) All pipes to be considered fully deteriorated.
 - 2) All pipes shall be subjected to soil load of 120 lbs./c.ft., with applicable live load, and water table two (2) feet below the top of the ground.
 - 3) All pipes shall have a minimum of 2% ovality in the circumference
 - 4) The above liner thicknesses shall be maintained as a minimum.
-
4. The flexible tube shall be fabricated to a size that when installed will neatly fit (minimum 99.75%) the internal circumference of the existing sanitary sewer lines (including services). Allowance shall be made for circumferential stretching during insertion so that the final cured product is snug against the wall of the host pipe.
 5. The outside layer of the tube shall be coated with an impermeable, flexible membrane that will contain the resin and allow the resin impregnation (wet out) procedure to be monitored.
 6. The tube shall contain no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
 7. The wall color of the interior pipe surface of CIPP after installation shall be a relatively light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.
 8. Seams in the tube shall be stronger than the non-seamed felt material.
 9. The tube shall be marked for a distance at regular intervals along its entire length, not to exceed five feet. Such markings shall include the Manufacturers name or identifying symbol.
 10. Unless otherwise specified, the Contractor will use a polyester filter felt tube and a resin and catalyst system compatible with the inversion process and having the minimum physical properties for the cured pipe identified in Table 02771 - 1 Minimum Physical

Properties.

B. Resin

1. The resin system shall be a corrosion resistant polyester or vinyl ester resin and catalyst system or epoxy and hardener system that when properly cured within the tube composite, meets the minimum requirements of ASTM F1216 as tested in accordance with ASTM D543, ASTM F1743 or F2019, the physical properties given herein these specifications Section 02771 and those, which are to be utilized in the design of the CIPP for this project. 06-08-2020 Conformed ▲
2. The resin used shall not contain non-strength enhancing fillers.
3. The Contractor shall submit the resin characteristics, including filler identification, to the City for approval prior to lining activities.
4. The resin shall produce a CIPP that will comply with the structural and chemical resistance requirements of the specification.

C. Point Repair CIPP Sectional Liners

1. Starting point, anywhere within main run.
2. Length as needed to provide a 1 ft. margin from the defect.
3. Time for cure, 2 hours.
4. End thickness to taper down to 5mm for main line sleeves.

~~PART 11~~—PART 13 - EXECUTION

~~11.01~~13.01 PREPARATION

A. Prior to any lining of a pipe so designated.

1. It shall be the responsibility of the Contractor to remove all internal debris and clean the existing sewer line and/or lateral in accordance with the recommendations of the liner manufacturer prior to installation of the liner and in accordance with Section 02761 "Cleaning Sanitary Sewer Systems." Both mainline and lateral line shall be cleaned.
 1. Preparation of the interior surface shall be accomplished by a thorough high-pressure water-jet cleaning. The pipe shall be left free of all loose sand, rock, or other deleterious materials. Any roots in the pipe shall be either removed or cut off flush with the interior.
 2. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning or where additional damage would result if cleaning is attempted or continued, the Contractor shall notify the City immediately. The City will determine what course of action will be taken to complete the project.
 3. Precautions shall be taken by the Contractor to ensure that no damage or flooding of public or private property is caused by the cleaning operation.
 4. The City shall inspect the prepared pipe for cleanliness and smoothness before the Contractor is authorized to proceed with pipe lining operations.
 5. Mains or laterals that had roots prior to cleaning shall receive chemical root treatment.
2. Certified PACP personnel trained in locating breaks, obstacles and service connections by closed circuit television shall perform inspection of existing sewer lines. The interior of the line shall be carefully inspected in accordance with Section 02762 "Televising Sanitary Sewer Systems" to determine the location of laterals in any condition that may prevent proper installation of the liner pipe into the lines. Such conditions shall be noted so they

can be corrected. A digital data video and a suitable log shall be prepared by the Contractor during the Work and provided to the City a minimum of two weeks prior to liner installation.

3. The Contractor shall provide for the flow of sewage around the section or sections of pipe designated for lining as specified in Section 01516 "Collection System Bypass."
 1. Flow control shall be exercised as required to ensure that no flowing sewage comes into contact with sections of the sewer under repair.
 2. A sewer line plug shall be inserted into the sewer upstream from the section to be repaired. The plug shall be so designed that all or any portion of the sewage flows can be released. During the review, testing and installation portion of the operation, flows shall be shut off in order to properly install the cured-in-place pipe lining. The upstream manholes shall be constantly monitored for degree of surcharging. After the installation is complete, flows shall be restored to normal level.
 3. Wherever lines are blocked off and the possibility of backing up the sewage and causing harm to public and private property is foreseen, it shall be the Contractor's responsibility to bypass flow from manhole to manhole.
 4. Bypassing shall be accomplished using sewer plugs with pump connections, by pumping down surcharged manholes, or by other methods acceptable to the City. All bypassed flow must be discharged to a sanitary sewer. Bypassed flow shall not be allowed to enter any storm line, drainage ditch or street gutter.
 5. During a bypass operation, the pump shall be manned continuously; the Contractor shall maintain the pump and bypass equipment; and shall be responsible for any damages to public or private property due to the malfunction of same.
4. The Contractor shall clear the line of obstructions such as solids, dropped joints, protruding service connections or collapsed pipe that will prevent the insertion of the liner pipe. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then the City shall be notified immediately.
5. If, in the opinion of the CIPP liner manufacturer, the rate of infiltration in the sewer segment is high enough to risk washout of the resin then the Contractor shall perform measures, such as grouting or installation of a pre-liner, as required to minimize infiltration prior to installation. If during the pre-CCTV inspection any infiltration conditions are observed, the Contractor shall submit, in writing for approval by the Owner, the methods and materials for mitigating any adverse impacts from infiltration.
6. Do not install liner if ground water temperatures and/or ambient temperatures are excessive for the product installation procedures.
7. Refer to Section 01001, General Work Requirements paragraph 1.16.C for Notification of Public or Customers. No sewer or water service is to remain shut down for more than a period of 8-hours unless the Contractor provides substitute services for the residents. Commercial sewer services shall always be maintained so that the business remains open. No sewage from the services or main line shall be discharged on the ground or in waterways.
8. Contractor shall coordinate pump stations, force main and sanitary sewer operation, bypass and shutdown control with the City
9. Traffic Control: The Contractor shall provide all traffic control measures required for the safety of the public, workers and equipment during the Work and in accordance with FDOT and the City.
10. The Contractor shall provide critical backup equipment to ensure that the lining operation progresses without interruption. Required backup equipment shall include at a minimum

1 additional lateral cutter system and 1 additional CCTV camera system.

11.0213.02 INSTALLATION OF LINER

- A. The CIPP liner shall be installed and cured in the host pipe per the manufacturer's specifications as described and submitted in the Performance Work Statement. CIPP installation shall be in accordance with the applicable ASTM Standards with the following modification:
1. Prior to installation and as recommended by the manufacturer remote temperature gauges or sensors shall be placed inside the host pipe to monitor the temperatures during the cure cycle. Liner and/or host pipe interface temperature shall be monitored and logged during curing of the liner.
 2. Verify liner end seals are in-place in the wetted liner.
 3. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat source. Another such gauge shall be placed between the impregnated reconstruction tube and the pipe invert at the remote manhole to determine the temperatures during cure. The resin manufacturer shall recommend temperature in the line during the cure period.
 4. The wet-out tube shall be positioned in the pipeline using the method specified by the manufacturer. Care should be exercised not to damage the tube as a result of installation. The tube shall be inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point. Sufficient excess resin will be provided to ensure excretion into cracked pipe and/or joints of the host pipe after curing.
 5. After inversion is completed, the Contractor shall supply suitable heat source and recirculation equipment. The equipment shall be capable of delivering the heat source throughout the section uniformly to raise the temperature above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed. Temperatures shall be monitored and recorded throughout the installation process to ensure that each phase of the process is achieved at the manufacturer's recommended temperature levels. Copies of these records shall be given to the City at the completion of each installation.
 6. Curing shall be accomplished by utilizing the appropriate medium in accordance with the manufacturer's recommended cure schedule. The curing source input and output temperatures shall be monitored and logged during the cure cycles if applicable. The manufacturer's recommended cure method and schedule shall be used for each line segment installed in consideration of the existing conditions and in accordance with applicable ASTM Standards. 06-08-2020 Conformed
 7. For heat cured liners, if any temperature sensor or multiple sensors do not reach the temperature as specified by the manufacturer to achieve proper curing or cooling, the installer can make necessary adjustments to comply with the manufacturer's recommendations. The system computer should have an output report that specifically identifies each installed sensor station in the length of pipe, indicates the maximum temperature achieved and the sustained temperature time. Each sensor should record both the maximum temperature and the minimum cool down temperature and comply with manufacturer's recommendations.
 8. For UV cured liners, all light train sensor readings, recorded by the tamper proof computer, shall provide output documenting the cure along the entire length of the installed liner. The cure procedure shall be in accordance with the manufacturer's recommendation as

- included in the performance work statement.
9. Temperatures and curing data shall be monitored and recorded by the Contractor throughout the installation process to ensure that each phase of the process is achieved as approved in accordance with the CIPP system manufacturer's recommendations.
 10. The Contractor shall immediately notify the City of any delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the City's discretion. The cost of such test shall be borne by the Contractor and no extra compensation will be allowed. Any failure of sample tests or a lack of immediate notification of delay shall be automatic cause for rejection of that part of the Work at the City's discretion.
 11. Initial cure shall be deemed to be completed when inspection of the exposed portions of cured pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the cured-in-place inversion process, during which time the recirculation of the heat source and cycling of the heat exchanger to maintain the temperature continues. Contractor shall retain a resin-impregnated sample (wick) to provide verification of the curing process taking place in the host pipe.
 12. The Contractor shall cool the hardened pipe to a temperature below 100°F before relieving the static head in the inversion standpipe. Cool-down may be accomplished by the introduction of cool water into the inversion standpipe to replace water being drained and disposed per the approved pre-treatment plan. Care shall be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed pipe.
 13. Seal the area where the line enters or leaves each manhole. Finish the inside of the manhole with a quick set cement grout to raise the invert to the grade of the liner pipe. Also use this grout to dress up around the end of the liner. This space may be sealed with a mechanical seal, chemical seal, or combination of both. The Contractor shall seal the liner at all manhole reconnections with an approved product, compatible with the liner, to completely seal any annular space present.
 14. If the pipe liner fails to make a tight seal due to broken or misaligned pipe at the manhole wall or other reason, the Contractor shall apply a seal at that point.
 15. The temperature of water discharged to the sewer system from processing liners shall not exceed 100°F maximum or the level allowed by State or Local standards. When draining water, care shall be exercised not to create a vacuum in the line.
 16. After the liner has been installed, all active, existing services shall be temporarily reinstated. This shall be done without excavation in pavement areas, and in the case of non-man-entry pipes, from the interior of the pipeline by means of a 360° (degree) television camera and a cutting device that re-establishes the service connection. When a remote cutting device is used and a cleanout is available, then a mini camera down the service may also be used to assist the operator in cutting or trimming. All coupons shall be recovered at the downstream manhole and removed.
 17. The cost for maintaining sanitary sewer service for the property owners shall be included in the prices bid and no additional compensation will be allowed.

11.0313.03 POST INSTALLATION

A. Service Lateral Renewal

1. The number of service connections on some sewer segments may exceed the number of buildings served. It is the Contractor's responsibility to determine through dye testing, or other acceptable methods, the services that are live and require reinstatement prior to commencing lining of the sewer main.
 2. Inactive services to vacant parcels shall be renewed, unless otherwise directed by the City.
 3. The exact location and number of service connections or side sewers shall be verified during the initial television inspection. It shall be the Contractor's responsibility to accurately field locate all existing service connections or side sewers and establish means for access for flow control. The Contractor shall reconnect all service connections or side sewers to the liner pipe as indicated in accordance with the Contract Documents.
 4. The Contractor shall be responsible for restoring/correcting, without any delay, all missed or faulty reconnections, as well as any damage caused to property owners for not reconnecting the services soon enough or for not giving notice to the property owners.
 5. Any lateral not initially reinstated by the Contractor that proves to be active shall be reinstated by the Contractor at no additional cost to the City and the Contractor shall be responsible for any resulting property damage of floods.
 6. All existing service connections shall be reconnected by a remote-controlled cutting device directed internally by a television camera or by internal manual cutting. Cuts shall be made by experienced operators so that no blind attempts or holes are made in the liner pipe. Locations shall be verified carefully to match earlier tapes for accurate lateral location, especially where dimples are not well defined. The City reserves the right to require service connection by excavation at the Contractor's expense at any location if the quality of workmanship of the cut is not satisfactory.
 7. A 2-pass process of utilizing a cutter to open the lateral followed by wire brush (or similar) attachment to complete the cutting flush with the lateral walls should be utilized or approved alternate. It shall be properly aligned, invert to invert, to the existing connection with no obstructions to the flow. Resin slugs shall be removed as necessary from reinstated service connections. Any mis-cuts shall be repaired at no cost to the City and shall be performed utilizing an additional thinner liner to prevent water from entering behind the liner to the full satisfaction of the City. All coupons cut from the liner for reopening of lateral connections shall be retrieved from the sewer, accounted for by the Contractor, and turned over to the City.
 8. Service connections shall be reinstated to at least 95% of the original area as it enters the host pipe.
 9. All service connections and side sewers to be reconnected to the main sewer, shall be cleaned up to a length of 1-foot from the inside face of the existing wall of the main pipe. All deposits within the first foot of the service connection or side sewer in the service connections shall be removed and laterals reinstated.
 10. Contractor shall provide a sound, smooth transition from laterals/side sewers to the main sewer. Contractor shall submit for approval a detailed repair plan for the permanent repair of any gaps between the installed liner and the face of the lateral/side sewer connections.
 11. For PVC laterals or laterals that have been previously lined with cured-in-place pipe the Contractor shall take care during the reinstatement to avoid damage to the lateral pipe.
- B. Each pipelined shall be post-CCTV inspected in accordance with Section 02762 "Televising Sanitary Sewer Systems" as soon as practical after processing to assure complete curing.

1. The Contractor shall not reactivate any section of lined sewer pipe until authorized to do so by the City. Segments not fully conforming to these Specifications must be immediately brought to the City's attention with a proposed method of correction.
2. Immediately prior to conducting the post-lining CCTV, the Contractor shall thoroughly clean the newly installed liner removing all debris and build-up that may have accumulated, at no additional cost to the City.
3. The post-CCTV inspection documentation shall be submitted within 15 working days of the liner installation. The City may at its discretion suspend any further installation of CIPP until the post-installation documentation is submitted.
 1. As a result of this suspension, no additional working days will be added to the contract, nor will any adjustment be made for increase in cost. 06-08-2020 Conformed

▲
C. Defects

1. The liner shall be continuous and free of all visual and material defects except those resulting from pre-lined conditions (such conditions shall be brought to the attention of the City prior to lining).
2. There shall be no damage, deflection, holes, delaminating, uncured resin or other visual defects in the liner.
3. The liner surface shall be smooth and free of waviness throughout the pipe.
4. No visible leakage through the liner or at manhole or service lateral connections will be allowed.
5. Any defects located during the inspection shall be corrected by the Contractor to conform to the requirements of the specifications and to the satisfaction of the City.
6. Defects in the installed CIPP shall be identified and defined as specified in Section 02762 Televising Sanitary Sewer Systems.
7. Repairable defects that may occur in the installed CIPP shall be specifically defined by the Contractor based on manufacturer's recommendations, including a detailed step-by-step repair procedure, resulting in a finished product meeting the requirements of these contract specifications.
8. Un-repairable defects that may occur to the CIPP shall be clearly defined by the Contractor based on the manufacturer's recommendations, including a recommended procedure for the removal and replacement of the CIPP.

D. Manhole Connections

1. Where liners of any type are installed in 2 or more continuous manhole segments, the liner invert through the intermediate manholes shall be left intact. Final finishing of the installation in those intermediate manholes shall require removal of the top of the exposed liner and neat trimming of the liner edge where it touches the lip of the manhole bench.
2. Reinstate openings for all manhole drop assemblies after relining mainline sewer
 1. Outside drop assemblies shall be lined with a cured-in-place liner compatible with the mainline liner, for the full length of the drop assembly and bend.
 2. Inside drop assemblies are not required to be relined.
3. A seal consisting of a resin mixture or hydrophilic seal compatible with the installed CIPP shall be applied at manhole/wall interface in accordance with the CIPP system manufacturer's recommendations.

- E. Portions of any piece of liner material removed during installation shall be available for inspection and retention by the City.

11.0413.04 TESTING

- A. The physical properties of the installed CIPP shall be verified through field sampling and laboratory testing. All testing shall be furnished by the Contractor. All materials testing shall be performed at the Contractor's expense, by an independent third-party laboratory selected by the City as recommended by the CIPP manufacturer. All tests shall be in accordance with applicable ASTM test methods to confirm compliance with the requirements in these documents.
- B. The Contractor shall pay for all testing included in this section
- C. The Contractor shall provide samples for testing from the actual installed CIPP liner. The Contractor shall determine sampling location and procedures to ensure representative samples are obtained from the finished liner, subject to the approval by the City. The contractor shall provide removable sizing sleeves, when possible, to collect liner samples, which accurately replicate the host pipe diameter. 06-08-2020 Conformed ▲
1. A minimum of 1 sample shall be taken of the first segment installed or as directed by the City.
 2. A minimum of 2 samples shall be taken for each 2,500 lineal feet of liner material installed or for each manufacturing lot, if less, or as directed by the City.
 3. A minimum of 6 samples per project shall be taken for each type of liner furnished or as directed by the City.
 4. A sample shall be cut from a section of cured liner that has been inverted or pulled through a like diameter pipe which has been held in place by a suitable heat sink such as sandbags.
 5. All curing, cutting, and identification of samples shall be witnessed by the City.
- D. Tests of the samples shall be conducted in accordance with ASTM standards
1. Short term flexural properties: The initial tangent flexural modulus of elasticity and flexural strength shall be measured in accordance with test methods in ASTM D790.
 2. Fiber reinforced flexural properties: specimens should be sampled in accordance with ASTM F1743, section 8.1.2 and flexural properties shall be determined in accordance with ASTM F1743, section 8.1.3 along the longitudinal and circumferential axis of the install CIPP.
 3. Fiber reinforced tensile properties: Where the CIPP is reinforced with oriented continuous or discontinuous fibers to enhance the physical properties of the CIPP, specimens shall be sampled in accordance with ASTM F1743, section 8.1.2 and tensile properties shall be determined in accordance with ASTM D3039 and tested along the longitudinal axis and circumferential axis of the installed CIPP.
 - a. One random tensile test will be taken on each Work Order. The segment from which this test sample is taken will be selected by the City. 06-08-2020 Conformed ▲

4. CIPP wall thickness shall be determined in a manner consistent with ASTM D5813, section 8.1.2. Thickness measurements shall be made in accordance with the practice in ASTM D3567 for ASTM D5813, section 8.1. Deduct from the measured values the thickness of any plastic coating or CIPP layer not included in the structural design of the CIPP. The average thickness shall be calculated using all measured values and shall meet or exceed the minimum design thickness. The minimum wall thickness at any point shall not be less than 87.5% of the approved specified thickness.
- E. The installed CIPP thickness shall be measured for each liner shipment to the job site. If the CIPP thickness does not meet that specified in the contract and submitted as the approved design by the Contractor, then the liner shall be repaired or removed. The samples shall be made by core drilling 2-inch diameter test plugs at random locations selected by the City. As an alternative the Contractor may use industry proven, non-destructive methods for confirming the thickness of the installed CIPP if it can be shown the calibrated thickness is the same as core test plugs.

11.0513.05 ACCEPTANCE

A. Liner

1. It is the intent of these specifications that the completed liner with all appurtenances shall be essentially equivalent in final quality and appearance to new sewer installation.
2. The finished liner shall be continuous over the entire segment between manholes and homogenous throughout.
3. The finished liner shall be fully rounded and as free as commercially practicable from visible defects, including but not limited to damage, deflection, holes, delamination, ridges, cracks, uncured resin, foreign inclusions or other objectionable defects.
4. Where a defect in the liner requires removal of a section of the liner in the City's opinion, the Contractor shall make all repairs as required by the City and shall install a segmental liner, compatible with the liner, to accomplish a continuous finished liner.
5. The pipe shall be neatly and smoothly cut off at each manhole. The manhole trough shall be raised to the invert of the liner to preclude snagging and shoaling of debris.

- B. Defects: Any defect which will or could affect the structural integrity, strength of the lining, flow impairment, or leaks shall be repaired as outlined below or in accordance with the approved repair or replacement procedures as recommended by the CIPP system manufacturer. The repair or replacement of the defects will be at the Contractor's expense.

1. Leaks

1. There shall be no visible infiltration through the liner, around the liner at manhole connections, at lined service connections or in lined services. Contractor shall repair any visible leaks and the repair method shall be approved by the City.

2. Wrinkles/Fins

1. Wrinkles outside the flow line of the pipeline:
 - a. Wrinkles/fins in height up to a maximum of 5% of the inside diameter of the host pipe are acceptable
 - b. Wrinkles/fins over 5%, particularly those of a longitudinal configuration, may be acceptable and should be evaluated, by the project engineer for acceptance, on a case-by-case basis.
2. Wrinkles in the flow line:

- a. Wrinkles/fins projecting more than 5% into the flow that are generally longitudinal in their orientation may be deemed acceptable by the City on a case-by-case basis by considering any potential operation and maintenance issues that would result from their being left in place.
 - b. Wrinkles/fins in the lower third or flow line of the finished CIPP (based upon the depth of flow) that are generally circumferential in their orientation should not exceed 0.5-inches, whichever is smaller. Acceptability of larger wrinkles/fins meeting this characterization shall be, on a case-by-case basis by the City with consideration given to potential operations and maintenance issues that would result from their being left in place.
3. Repair when wrinkles/fins are removed:
 - a. Wrinkles should be fully cured, tight and the resin should be homogeneous across the full width of the wrinkle.
 - b. In most cases, when wrinkles/fins are removed from the installed CIPP, the resin in the liner pipe is fully cured and homogeneous and no further repair is required. If a repair is required, the manufacturer should be contacted for the correct repair procedure.
3. Blisters should be probed and punctured to determine the existence of water behind the blister.
 1. No action required unless the pipe is leaking at the blisters.
4. Lifts in Liner
 1. Soft lifts should be re-processed by the Contractor to fully cure the CIPP.
 2. Hard lift shall be removed, and a new short liner as required being equivalent to the original installed CIPP.
5. A bulge in the invert caused by residual debris left in the pipe that impedes the flow characteristics of the pipeline should be cut out.
 1. Cut out the section of the bulge and replace with a new short liner equivalent to the original product or as recommended by the manufacturer.
6. Pinholes: the area where the liner has pinholes should be patched with a short-liner repair or the liner removed and replaced as recommended by the manufacturer.
7. Soft spot in liner needs to be reheated and hardened or cut out and replaced or as recommended by the manufacturer.
8. Dry tube or white spots are not acceptable and shall be removed and a patch repair shall be performed or as recommended by the manufacturer.
9. Liner surface peeled off
 1. Cut out a representative sample of the CIPP
 2. Test physical properties and remaining CIPP thickness to verify that the contract design requirements are met.
 3. Replace liner or as recommended by the manufacturer
10. Hole in the liner is not acceptable
 1. Small holes can be repaired with epoxy
 2. Short liner installed over larger holes or as recommended by the manufacturer
11. Cracks in liner are unacceptable and shall be repaired
12. Loose liner seam tape shall be removed to prevent potential hang-up of debris.
13. Annular space between host pipe and liner at manhole
 1. If leaking between the host pipe and the CIPP, inject a hydrophilic type grout to stop the leakage.

2. If the pipe is located in groundwater, inject a hydrophilic type grout to stop possible future leakage.
3. If the pipe is not in groundwater, a cementitious grout can be used to fill the space.
14. Liner delamination
 1. Cut out the section of delaminated liner and replace with a new short liner equivalent to the original product or as recommended by the manufacturer.
15. CIPP discoloration
 1. Obtain a sample for testing the CIPP physical properties. Follow manufacturer's recommendations for repair.
 2. Remove and replace the CIPP physical if the physical properties do not meet the contract minimum requirements.
 3. No action required if the tested samples meet the physical properties.
16. Improper repair of CIPP: duct tape is not an acceptable repair for any situation.
17. The CIPP should fit tight inside the host pipe.
 1. If the CIPP does not fit tightly against the original pipe at its termination point(s), the full circumference of the CIPP exiting the existing host pipe should be sealed by filling with a resin mixture compatible with the CIPP.
18. Overcut connection not allowed
 1. Opening cut to match bottom of service pipe to eliminate debris build-up
 2. If an overcut is made, grout the interface between the connection and the mainline
 3. Install a connection hat
 4. Install a short liner, then re-cut the service connection opening
19. Leakage between CIPP and host pipe at service connection
 1. Leakage shall be stopped
 2. Grout the interface between the connection and the mainline
 3. Install a one piece main and lateral CIPP liner with end seals.
20. Connection hat issue
 1. Coating from mainliner not removed before installing the hat
 2. Loose material shall be removed
 3. Remove and replace the connection hat as recommended by the manufacturer
21. Undercut service connection
 1. Finish cut with brush to create a smooth opening
22. Resin slug in service connection
 1. If not blocking the flow from the service connection and slug does not impede more than 20% of the connection opening, no action required
 2. If blocking the flow, remove slug or dig up and replace the connection

C. Service Connections

1. The CIPP lateral lining shall not inhibit the CCTV post video inspection of the mainline or service lateral pipes.
2. Reinstatement of all lateral connections shall be done neatly and smoothly.

11.0613.06 CLEAN-UP AND RESTORATION

- A. The Contractor shall not allow the site of the Work to become littered with trash and waste material but shall maintain the site in a neat and orderly condition throughout the construction period.

- B. On or before completion, the Contractor shall clean and remove from the site of the Work all surplus and discarded materials, temporary structures, stumps and portions of trees, and debris of any kind. He shall leave the site of work in a neat and orderly condition, similar or equal to that prior to construction.
- C. All private and public property along or adjacent to the Work disturbed by construction operations shall be restored to a condition similar or equal to that existing prior to construction.
- D. Before final acceptance by the City, the Contractor shall replace and/or restore any water, sewer, drain, and gas lines and appurtenances; electrical, telephone, telegraph conduits and wires, both underground and aboveground, and appurtenances; traffic signals, fire and police alarm systems and appurtenances; sidewalks, curbs, gutter, drainage ditches and pavements and all other public utility facilities and appurtenances along or adjacent to the Work that may have been disturbed by construction operations.
- E. Conditions permitting, property cleanup and restoration shall begin and be prosecuted to completion on a timely basis as set forth herein.

11.0713.07 PROGRESSIVE CIPP INSTALLATION RECORD (SHOT RECORD)

- A. The Contractor shall provide a progressive CIPP Installation Record (Shot Record) with monthly application for partial payments. The progressive shot record shall indicate quantities actually installed and deviations to the parameters included in the shot record (i.e. shot number and corresponding manhole to manhole pipe reaches for each scheduled installation, design thickness, actual thickness delivered to the site, pipe diameter, reach length, total length of shot, and number of laterals).
- B. Monthly partial payments will not be approved without prior approval of the progressive CIPP Installation record (Shot Record) including verification and acceptance of all quantities by the City.

11.0813.08 WARRANTY INSPECTION

- a.—The City may conduct the warranty television inspection within 1-year following completion of the project. If it is found that any of the CIPP has developed abnormalities since the completion of the project, the abnormalities shall be repaired and/or replaced by the Contractor promptly as per these specifications and as recommended by the manufacturer.

PART 4 – METHOD OF MEASUREMENT AND PAYMENT

4.01 Measurement and payment for Unit Price Schedule line items L1a through L8c and L10a through L10g will be based on the measured length from the centerline of the exit to the centerline of the entry manhole. Manhole ID dimension needs to be reported with the post inspection report.

END OF SECTION

Revised Unit Price Schedule - Maintenance of Traffic

Item	Description	Approximate Qty.	Unit	Unit Cost
Maintenance of Traffic (St. Johns County & FDOT)				
TM1	Traffic Control – MOT Index 601 or 602	1	Day	446.80
TM2	Traffic Control – MOT Index 603	1	Day	850.00
TM3	Traffic Control – MOT Index 604 or higher	1	Day	1200.00
TM4	Traffic Control – MOT Index 601 or 602	1	Week	2233.80
TM5	Traffic Control – MOT Index 603	1	Cost Plus	NA
TM6	Traffic Control – MOT Index 604 or higher	1	Cost Plus	NA
TM7	Flagman	1	Cost Plus	NA
TM8	Variable Message Board (per week)	1	Week	2233.80

Revised Unit Price Schedule - Sanitary Main CIPP Lining

Item	Description	Approximate Qty.	Unit	Unit Cost
Sanitary Sewers Renewal				
Sanitary Main CIPP Lining				
L1a	6" Diameter, 4.5mm Nominal thickness with end seals	2000	LF	33.50
L1b	Price for each 1.5mm thickness increase exceeding 4.5mm, 6" dia.	1	LF	5.60
L2a	8" Diameter, 6mm nominal thickness with end seals	5000	LF	26.40
L2b	8" Diameter, 7.5mm nominal thickness with end seals	3000	LF	26.10
L2c	Price for each 1.5mm thickness increase exceeding 7.5mm, 8" dia.	1	LF	2.20
L3a	10" Diameter, 6mm nominal thickness with end seals	4000	LF	31.10
L3b	10" Diameter, 7.5mm nominal thickness with end seals	2000	LF	30.60
L3c	Price for each 1.5mm thickness increase exceeding 7.5mm, 10" dia.	1	LF	2.80
L4a	12" Diameter, 6mm nominal thickness with end seals	2000	LF	34.50
L4b	12" Diameter, 7.5mm nominal thickness with end seals	1000	LF	37.00
L4c	Price for each 1.5mm thickness increase exceeding 7.5mm, 12" dia.	1	LF	3.40
L5a	15" Diameter, 6mm nominal thickness with end seals	300	LF	42.00
L5b	15" Diameter, 7.5mm nominal thickness with end seals	200	LF	56.50
L5c	Price for each 1.5mm thickness increase exceeding 7.5mm, 15" dia.	1	LF	3.90
L6a	16" Diameter, 7.5mm nominal thickness with end seals	200	LF	57.45
L6b	16" Diameter, 9mm nominal thickness with end seals	200	LF	70.45
L6c	Price for each 1.5mm thickness increase exceeding 9mm, 16" dia.	1	LF	4.50
L7a	18" Diameter, 7.5mm nominal thickness with end seals	150	LF	64.60
L7b	18" Diameter, 9mm nominal thickness with end seals	150	LF	74.25
L7c	Price for each 1.5mm thickness increase exceeding 9mm, 18" dia.	1	LF	5.60
L8a	20" Diameter, 10.5mm nominal thickness with end seals	100	LF	100.95

Item	Description	Approximate Qty.	Unit	Unit Cost
L8b	20" Diameter, 12mm nominal thickness with end seals	100	LF	109.95
L8c	Price for each 1.5mm thickness increase exceeding 12mm, 20" dia.	1	LF	6.70
L9a	8 & 10" Main, 4" Lateral reinstatement	50	Ea.	104.80
L9b	8 & 10" Main, 6" Lateral reinstatement	300	Ea.	104.80
L9c	12" Main, 6" Lateral reinstatement	200	Ea.	104.80
L9d	15" Main, 6" Lateral reinstatement	10	Ea.	250.00
L9e	16" Main, 6" Lateral reinstatement	10	Ea.	250.00
L9f	18" Main, 6" Lateral reinstatement	5	Ea.	300.00
L9g	Cutting and Brushing Lateral Connection, for fold-and-form lined piping.	1	EA	390.9
L10a	6" Pre-Liner Installation	1000	LF	1.50
L10b	8" Pre-Liner Installation	2000	LF	1.90
L10c	10" Pre-Liner Installation	1000	LF	2.40
L10d	12" Pre-Liner Installation	1000	LF	2.60
L10e	15" Pre-Liner Installation	300	LF	2.80
L10f	16" Pre-Liner Installation	200	LF	3.00
L10g	18" Pre-Liner Installation	150	LF	3.20

PROCUREMENT APPROVAL TRACKING

Approval City Manager
Procurement Type Renewal #2
Contract No. PW2020-06 Encumbrance No. (PO)
Vendor No. 13639

Contractor Name Insituform Technologies, LLC
Address 6966 Business Park Blvd., Jacksonville, FL 32256
Phone 904-838-0090 FAX 904-292-3198
Contractor PM Brandt Curvel EMAIL bcurvel@aegion.com
Contract Title Sanitary Sewer Cleaning, Inspection, and Renewal

ACCOUNT NO., AMT, (GRANT #)

INITIATING DEPT/DIV Public Works/Engineering
PROJECT MANAGER/PHONE Stephen Slaughter 904-209-4274
DEPARTMENT DIRECTOR/PHONE Reuben Franklin 904-209-4279

CONTRACT AMOUNT	REVISED TOTAL	INVOICING FREQUENCY	CONSTRUCTION	RETAINAGE	TIME PERIOD	EXPIRATION DATE
\$	\$					09/30/2025

	REVIEW		POST SOLICITATION REVIEW	
	INITIAL	DATE	INITIAL	DATE
Approvals Before CITY MANAGER Consideration				
STANDARD TEMPLATE: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	JP	May 18, 2023		
Contract Template Used (provide specific name of contract template used)				
QA/QC REVIEW	SW	May 19, 2023		
PROJECT/WORK ORDER MANAGER	S/S	May 19, 2023		
DEPARTMENT DIRECTOR	RF	May 19, 2023		
CITY ATTORNEY (Only if changes to Agreement template)				

Approval required when deviating from the Procurement Manual

DIRECTOR OF GENERAL SERVICES

	INITIAL	DATE
ITEM SENT TO CONTRACTOR (Signed by DD/CM: Yes <input type="checkbox"/> No <input type="checkbox"/>)		
ITEM RETURNED FROM CONTRACTOR		
ITEM SENT TO CITY MANAGER		
ITEM SENT TO CITY CLERK TO ATTEST		
ITEM SENT TO CITY ATTORNEY		
ITEM SCANNED INTO CONTRACT DATABASE		
EFFECTIVE DATE OF AGREEMENT/WORK ORDER		

**SECOND RENEWAL OF THE AGREEMENT BETWEEN
THE CITY OF ST. AUGUSTINE
AND INSITUFORM TECHNOLOGIES, LLC FOR SANITARY SEWER CLEANING,
INSPECTION, AND RENEWAL**

THIS RENEWAL AGREEMENT is entered into by and between the CITY OF ST. AUGUSTINE (the "City"), whose mailing address is P. O. Box 210, St. Augustine, Florida 32085, and INSITUFORM TECHNOLOGIES, LLC, ("Contractor"), whose address is 17988 Edison Avenue, Chesterfield, Missouri 63005.

The City entered into an Agreement with Insituform Technologies, LLC on October 7, 2020 for Sanitary Sewer Cleaning, Inspection, and Renewal for a term ending on September 30, 2021. The Agreement included the option to renew up to four (4) consecutive years.

- On September 24, 2021, the Agreement was renewed for an additional two (2) year term, October 1, 2021 through September 30, 2023 (Renewal #1).
- On October 26, 2021, the Agreement's Scope of Work was amended to include four new Sections, and Unit Price Schedule was amended to include Maintenance of Traffic and Sanitary Sewers Renewal and Sanitary Main CIPP Lining (Amendment #1).

The City and Contractor now desire to renew the Agreement for a final two (2) year term, October 1, 2023 through September 30, 2025 (Renewal #2).

In consideration of the mutual covenants contained herein and for other good and valuable consideration, the parties agree to the following:

1. The Agreement, Contract No. PW2020-06, is renewed for a final two (2) year term beginning October 1, 2023 and ending September 30, 2025. For satisfactory performance of the Work outlined in the Contract during this additional term period, the City agrees to pay Contractor in accordance with the Agreement's Revised Unit Price Schedule.
2. The City's Project Manager has changed to:

Stephen Slaughter, P.E.
904-209-4274
sslaughter@citystaug.com

All other terms and conditions of the Agreement are hereby ratified and continue in full force and effect.

SIGNATURES APPEAR ON THE FOLLOWING PAGE

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in duplicate, each of which shall be deemed an original on the day and year first below written.

CITY OF ST. AUGUSTINE,
FLORIDA a municipal corporation

ATTEST:

Name: _____
City Clerk

By: _____

Printed Name: _____

(SEAL)

Title: _____

Date: _____

INSITUFORM TECHNOLOGIES, LLC

Signed, sealed and delivered
in the presence of:

Janet Hass
Janet Hass (May 25, 2023 15:17 CDT)

Witness

Printed Name: Janet Hass

Ursula Youngblood
Ursula Youngblood (May 25, 2023 17:12 CDT)

Witness

Printed Name: Ursula Youngblood

By: Diane Partridge
Diane Partridge (May 25, 2023 14:28 CDT)

Printed Name: Diane Partridge

Title: Contracting and Attesting Officer

Date: May 25, 2023

APPROVED AS TO FORM AND
LEGAL SUFFICIENCY:

Isabelle C. Lopez, City Attorney

Signature: Joshua Pfeiffer
Joshua Pfeiffer (May 18, 2023 16:56 EDT)

Email: jpfeiffer@citystaug.com

Signature: Stephen Slaughter
Stephen Slaughter (May 19, 2023 08:42 EDT)

Email: sslaughter@citystaug.com

Signature: Sharon Whitener
Sharon Whitener (May 19, 2023 08:36 EDT)

Email: switener@citystaug.com

Signature: Reuben Franklin
Reuben Franklin (May 19, 2023 08:46 EDT)

Email: rfranklin@citystaug.com

Contract PW2020-06 Renewal #2 PAT for Sanitary Sewer Cleaning, Inspection, and Renewal.

Final Audit Report


2023-05-25

Created:	2023-05-18
By:	Joshua Pfeiffer (jPfeiffer@citystaug.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAoNb0-hgT55dkgtp9swh1sCtUdD6gXm9h


"Contract PW2020-06 Renewal #2 PAT for Sanitary Sewer Cleaning, Inspection, and Renewal." History

 Document created by Joshua Pfeiffer (jPfeiffer@citystaug.com)

2023-05-18 - 8:54:06 PM GMT

 Document e-signed by Joshua Pfeiffer (jPfeiffer@citystaug.com)


Signature Date: 2023-05-18 - 8:56:40 PM GMT - Time Source: server

 Document emailed to Sharon Whitener (swhitener@citystaug.com) for signature


2023-05-18 - 8:56:42 PM GMT

 Email viewed by Sharon Whitener (swhitener@citystaug.com)

2023-05-19 - 12:34:56 PM GMT

 Document e-signed by Sharon Whitener (swhitener@citystaug.com)

Signature Date: 2023-05-19 - 12:36:03 PM GMT - Time Source: server

 Document emailed to sslaughter@citystaug.com for signature

2023-05-19 - 12:36:07 PM GMT

 Email viewed by sslaughter@citystaug.com

2023-05-19 - 12:40:59 PM GMT

 Signer sslaughter@citystaug.com entered name at signing as Stephen Slaughter

2023-05-19 - 12:42:03 PM GMT

 Document e-signed by Stephen Slaughter (sslaughter@citystaug.com)

Signature Date: 2023-05-19 - 12:42:05 PM GMT - Time Source: server

 Document emailed to rfranklin@citystaug.com for signature


2023-05-19 - 12:42:07 PM GMT

 Email viewed by rfranklin@citystaug.com

2023-05-19 - 12:46:01 PM GMT

 Signer rfranklin@citystaug.com entered name at signing as Reuben Franklin

2023-05-19 - 12:46:35 PM GMT

 Document e-signed by Reuben Franklin (rfranklin@citystaug.com)

Signature Date: 2023-05-19 - 12:46:37 PM GMT - Time Source: server

 Document emailed to Diane Partridge (dpartridge@aegion.com) for signature

2023-05-19 - 12:46:38 PM GMT

 Email viewed by Diane Partridge (dpartridge@aegion.com)

2023-05-19 - 3:44:10 PM GMT

 Email viewed by Diane Partridge (dpartridge@aegion.com)


2023-05-24 - 2:31:34 PM GMT

 Email viewed by Diane Partridge (dpartridge@aegion.com)


2023-05-25 - 7:27:15 PM GMT

 Document e-signed by Diane Partridge (dpartridge@aegion.com)

Signature Date: 2023-05-25 - 7:28:00 PM GMT - Time Source: server

 Document emailed to Janet Hass (jhass@aegion.com) for signature

2023-05-25 - 7:28:04 PM GMT

 Email viewed by Janet Hass (jhass@aegion.com)

2023-05-25 - 8:17:31 PM GMT

 Document e-signed by Janet Hass (jhass@aegion.com)

Signature Date: 2023-05-25 - 8:17:55 PM GMT - Time Source: server

 Document emailed to Ursula Youngblood (uyoungblood@aegion.com) for signature

2023-05-25 - 8:17:57 PM GMT

 Email viewed by Ursula Youngblood (uyoungblood@aegion.com)

2023-05-25 - 10:12:06 PM GMT

 Document e-signed by Ursula Youngblood (uyoungblood@aegion.com)

Signature Date: 2023-05-25 - 10:12:56 PM GMT - Time Source: server

 Agreement completed.

2023-05-25 - 10:12:56 PM GMT





NOTICE OF INTENDED DECISION

DATE: June 4, 2020

TO: All Respondents
Request for Proposal #PW2020-06 for Sanitary Sewer Cleaning, Inspection and Renewal

FROM: Sharon Whitener, CPPO, Procurement Manager
General Services Department

SUBJECT: Notice of Intended Decision

As a result of the above-mentioned Request for Proposals it will be recommended to City Manager that the award be made as follows:

Recommend award of #PW2020-06: Sanitary Sewer Cleaning, Inspection and Renewal to the highest rank respondent:

Insituform Technologies, LLC

Attached please find the Evaluation Summary Sheet, (Attachment 1) and a document entitled "Notice of Rights" (Attachment 2), which describes certain rights you may have in regards to the awarding of this Request for Proposals. You should pay close attention to the time limitations specified in the Notice of Rights.

If you have any questions or comments based on the above recommendation, please contact me at (904) 209-4305 or, via email, at swhitener@citystaug.com.

Enclosures

Attachment 1 – Evaluation Summary Sheet
Attachment 2 – Notice of Rights

ATTACHMENT 1 – EVALUATION SUMMARY SHEET

Evaluation Summary Sheet RFP #PW2020-06 Sanitary Sewer Cleaning, Inspection and Renewal						
Company Name	CM#1	CM#2	CM#3	CM#4	Total Points	Ordinal Ranking
SAK	8.300	5.800	4.550	5.400	24.050	3
Hinterland Group. Inc	8.000	8.200	4.350	6.600	27.150	2
Atlantic Pipe Services	5.900	6.400	4.200	7.450	23.950	4
Insituform	8.600	7.500	6.600	6.850	29.550	1
GCU	5.200	5.600	3.900	6.000	20.700	5

Committee Member #1: James Wheeler, Engineering

Committee Member #2: Stephen Slaughter, Engineering

Committee Member #3: Wade Giddens, Utilities

Committee Member #4: Danny Hodges, Waste Water Collections

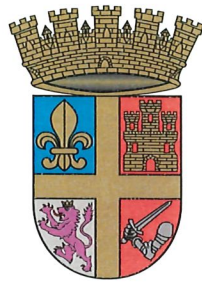
4/9/2020

ATTACHMENT 2 – NOTICE OF RIGHTS

Any person adversely affected by a City decision or intended decision to award a contract, or to reject all bids, proposals or qualifications, must file a Notice of Protest within three (3) business days after receipt of the decision or intended decision.

The protester must also file with the Director of General Services at the City of St. Augustine a Formal Written Protest within ten (10) days after the date the Notice of Protest is filed with the City. The Formal Written Protest must state with particularity the facts and law upon which the protest is based.

No additional time will be added for mailing. All filings must be addressed to and RECEIVED by the Director of General Services at the City of St. Augustine, Post Office Box 210, St. Augustine, Florida 32085 within the prescribed time periods. FAILURE TO FILE A PROTEST WITHIN THE TIME PRESCRIBED IN THIS NOTICE OF WILL CONSTITUTE A WAIVER OF PROCEEDINGS.



February 23, 2024

Nassau County Public Works
Attn: Ms. Becky Diden
45195 Musselwhite Road
Callahan, FL 32011

RE: Contract #PW2020-06 for Sanitary Sewer Cleaning, Inspection and Renewal with
Insituform Technologies, LLC

Dear Ms. Diden:

The City of St. Augustine approves piggybacking on the above referenced contract with Insituform Technologies, LLC for Sanitary Sewer Cleaning, Inspection. However, please be advised that in the event of any lawsuits or disputes with Insituform Technologies, LLC, the City of St. Augustine would not agree to be called as defense.

Please feel free to contact me at my office (904) 209-4305 or, via email, at swhitener@citystaug.com if you have any questions.

Sincerely,

Sharon F. Whitener, CPPO
Procurement Manager

SFW

xc: David Birchim, City Manager
Meredith L. Breidenstein, Assistant City Manager
Reuben C. Franklin, Jr., Assistant City Manager
Stephen L. Slaughter, Utilities Director
File

EXHIBIT "B"

VENDOR'S PROPOSAL



AEGION®

Stronger. Safer. Infrastructure.®



Insituform®

**RFP No. PW2020-06 – REQUEST FOR
PROPOSAL**

**SANITARY SEWER CLEANING,
INSPECTION AND RENEWAL**



Prepared for: The City of St. Augustine, Fl.

March 10th, 2020

TAB 1: BACKGROUND AND QUALIFICATIONS



Insituform®
an AEGION™ company

FORMS**PROPOSAL FORM**

**(This form must be completed and included in proposal submittal under
TAB 1 or the Proposal will be determined to be Non-Responsive)**

RESPONDENT:

The undersigned, as Respondent, hereby declares and certifies that the only person(s) or entities interested in this Proposal as principal(s), or as persons or entities who are not principal(s) of the Respondent but are substantially involved in performance of the Work, is or are named herein, and that no person other than herein mentioned has any interest in this Proposal or in the Agreement to be entered into; that this Proposal is made without connection with any other person, company, or parties submitting a Proposal; and that this Proposal is in all respects fair and in good faith without collusion or fraud.

Respondent represents to the City that, except as may be disclosed in an addendum hereto, no officer, employee or agent of the City has any interest, either directly or indirectly, in the business of Respondent to be conducted under the Agreement, and that no such person shall have any such interest at any time during the term of the Agreement, should it be awarded to Respondent.

Respondent further declares that it has examined the Agreement and informed itself fully in regard to all conditions pertaining to this solicitation; it has examined the specifications for the Work and any other Agreement documents relative thereto; it has read all of the addenda furnished prior to the Proposal opening, as acknowledged below; and has otherwise satisfied itself that it is fully informed relative to the Work to be performed.

Respondent agrees that if its Proposal is accepted, Respondent shall contract with the City in the form of the attached Agreement, and shall furnish everything necessary to complete the Work in accordance with the time for completion specified in the Agreement, and shall furnish the required evidence of the specified insurance.

Acknowledgment is hereby made of the following addenda (identified by number) received:

Addendum No.	Date	Addendum No.	Date
<u>1</u>	<u>2/10/20</u>	<u> </u>	<u> </u>
<u>2</u>	<u>2/27/20</u>	<u> </u>	<u> </u>
<u>3</u>	<u>3/9/20</u>	<u> </u>	<u> </u>

Firm name: Insituform Technologies, LLC
 Signature:  Janet Hass
 Date: March 2, 2020

March 9, 2020

City of St. Augustine, Florida

ADDENDUM NO. 1

RFP NO. PW2020-06 SANITARY SEWER CLEANING, INSPECTION AND RENEWAL

Date: February 10, 2020

To: All Prospective Respondents and Others Concerned

Subject: Addendum No. 1 to Proposal Documents

This addendum is hereby incorporated into the Proposal documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~striketrough~~.

The Respondent shall acknowledge receipt of this addendum by completion of the acknowledgement form in the Proposal document. Acknowledgement must be completed and included with the Proposal.

The Proposal documents for the subject project are hereby amended as follows:

CLARIFICATIONS:

A. The solicitation time frames have changes as follows:

2/21/2020 – Last day for questions/ clarifications
2/26/2020 – Final Addendum issued
3/02/2020 – Proposals Due by 2:00 p.m. EST
3/02/2020 – Proposals will be publicly opened at 2:15 p.m. EST
3/12/2020 – Evaluation Committee Meeting 10:00 a.m. EST
3/19/2020 – Oral Presentations 10:00 a.m. EST
3/26/2020 – Negotiations 10:00 a.m. EST

B. All sectional CIPP liner unit prices are to be based on nominal thickness; this addition is to be included with line items SL1 through SL8 in the Unit Price Schedule section Sanitary Sewer Sectional CIPP Lining. See Answer 7.c. below and the Revised Unit Price Schedule - Attachment #2.

DELETIONS/ ADDITIONS:**A. Unit Price Schedule in section- Sanitary Sewer Service Lateral CIPP Lining:****DELETE/ ADD:**

1. Line LL1a- **Delete:** ~~-12" inserted 12" up into the lateral, including end seals.~~
Add: a 32" main and lateral insertion not to exceed 20 feet both with end seals.
2. Line LL1b- **Delete:** ~~greater than 12". (add in to item LL1a).~~ **Add:** beyond 20 feet.
3. Line L3a- **Delete:** ~~L3a.~~ **Add:** LL3a
4. Line L3b- **Delete:** ~~L3b.~~ **Add:** LL3b
5. **Add** new Line:

LL3c	<u>Price for each 1.5 mm thickness increase of the One-piece main/ lateral connection (LL1a) exceeding 4.5 mm nominal, 6" dia.</u>	<u>1</u>	<u>LF</u>	
------	--	----------	-----------	--

6. Lines- LL3b, SL1, SL2, SL3, SL4, SL5, SL6, SL7 and SL8 **Add:** nominal after mm.

B. Page 72, Section 1.02 MINIMUM CONTRACTOR QUALIFICATIONS, Item D.:**A. DELETE: D. ~~Chemical Root Treatment.~~**

1. ~~The Contractor shall be licensed as a Certified Pesticide Applicator with the State of Florida prior to bid date.~~

RESPONSES TO BIDDER'S QUESTIONS:

Q1. Please provide the estimated annual expenditure/budget for the initial year and the estimated expenditure/budget for the four (4) optional renewal years?

A1. The City has budgeted the following amounts for the initial and four (4) optional renewal years:

- **Fiscal year 2020 and 2021 (October 2019 through September 2021) \$1.115 million for all I&I elimination work.**
- **Optional Year 1 - Fiscal year 2022 (October 2021 through September 2022) \$650,000 for all I&I elimination work.**
- **Optional Year 2 - Fiscal year 2023 (October 2022 through September 2023) \$650,000 for all I&I elimination work.**

- **Optional Year 3 – Fiscal year 2024 (October 2023 through September 2024) \$700,000 for all I&I elimination work.**
- **Optional Year 4 – Fiscal year 2025 (October 2024 through September 2025) The City does not have a current estimated budget for this year. A reasonable estimate is \$700,000 for all I&I elimination work.**

Q2. Please provided a copy of the bid tabulation from the two previous contracts of this nature.

A2. The City has not previously solicited for the services included in this solicitation.

Q3. Please provide a copy of the two previous annual contracts for this job.

A3. See the City's response to Question 2. The City has not contracted for the services included in this request.

Q4. Please provide a copy of all work orders issued off of this contract over the last year.

A4. See the City's response to Question 2. The City has not contracted for the services included in this request.

Q5. How will unit pricing be scored during the proposal's evaluation?

A5. A tabulation of all unit prices included in the Revised Unit Price Schedule will be developed. This tabulation will include the unit prices from all proposals received by the City. This tabulation will be the basis for evaluating the submitted Revised Unit Price Schedule.

Q6. Does the City specify the curing method for the pipe liners?

A6. No. The main sewer liner shall be cured in accordance with the manufacturer's specifications, reference paragraph 3.02 of Section 02771. Curing of lateral CIPP liners is describe in paragraph 3.09 of Section 02772. The lateral CIPP lining Specification Section does not specifically state but the City will require that the lateral liner is cured in accordance the manufacturer's specifications.

Q7. Is the thickness of the liners based on nominal or cured?

A7.a. Sewer main CIPP lining unit prices are to be based on nominal thickness, reference Section Sanitary Main CIPP Lining section of the Revised Unit Price Schedule.

A7.b. Sewer Lateral CIPP lining unit prices are to be based on nominal thickness, reference Section Sanitary Sewer Service Lateral CIPP Lining section of the Revised Unit Price Schedule.

A7.c. All sectional CIPP liner unit prices are to be based on nominal thickness; this addition is to be included with line items SL1 through SL8 in the Revised Unit Price Schedule section Sanitary Sewer Sectional CIPP Lining. See ADDITIONS/ DELETIONS B. Item 6. Above.

Q8. Does the City have 6" mains in the gravity collection system, and will they be lined if required?

A8. Yes, the City has a limited number of 6" mains in the sanitary sewer gravity system. In general, they are shallow bury and may be lined if it is cost effective to do so.

Q9. Do we have to use the equipment form to list each piece of equipment if we have 100 trucks?

A9. Yes, you may summarize the list of vehicles on the equipment form, and you may also include a spreadsheet listing equipment that is referenced on the form if desired. This form is required to be included in the Respondent's Proposal to the City.

Q10. Is there a precedent between the Technical Specification Sections or referenced industry standards?

A10. No. The technical specifications and standards are intended to be complementary. Bring all apparent conflicts between these documents to the City's attention so that they may be resolved before the date of the Final Addenda. The City will consider extending the date of the last day for questions or final addenda if a critical conflict is identified.

Q11. Consider changing the one piece main/lateral connection insertion length into the lateral, reference items in the Unit Price Schedule section Sanitary Sewer Service Lateral CIPP Lining.

A11. See DELETIONS/ ADDITIONS A. 1- 3 above.

Q12. Due to the large amount of information/ reports/ references required to be submitted with this RFP, would the City/ Owner be willing to postpone the proposal date by one week to ensure respondents have ample time to gather accurate information?

A12. Extending the due date is acceptable, see DELETIONS/ ADDITIONS A. above for revised dates.

Q13. On Page 72 of the bid docs, 1.02 MINIMUM CONTRACTOR QUALIFICATIONS, Letter "D" requires the Contractor shall be a licensed Certified Pesticide Applicator within the State of Florida prior to the bid date. Is this a valid request for this particular RFP? If so, can the City/Owner elaborate on this requirement?

A13. No, this qualification requirement will be removed from the documentation required with proposals. The requirement remains as a work qualification but only applies when chemical root treatment is performed. See DELETIONS/ ADDITIONS C. above.

ATTACHMENTS:

1. Non-mandatory Pre-proposal Meeting Sign-in Sheet
2. Revised Unit Price Schedule

All other terms and conditions of the original Request for Bid documents remain the same.

Jill C. Collins

Procurement Specialist

ATTACHMENT #1

NON-MANDATORY PRE-PROPOSAL MEETING ATTENDEES

FOR
CITY OF ST. AUGUSTINE
January 30, 2020

#PW2020-06 SANITARY SEWER CLEANING, INSPECTION AND RENEWAL

COMPANY NAME (Please Print)	REPRESENTATIVES NAME	OFFICE TELEPHONE NUMBER (Including Area Code)	E-MAIL ADDRESS
BLD Services, LLC	Gordon Marshall	770-317-1600	gordon@bldllc.net
Granite Inliner	John Sunderman	386-279-9412	john.sunderman@gcinc.com
SAK Construction	Terry Adderhold	904-334-6686	bidcippe@sakcon.com
Insituform	Dave Raymond	904-465-3267	draymond@aegion.com

Jill C. Collins

CITY OF ST. AUGUSTINE
RFB NO. PW2020-06
SANITARY SEWER CLEANING, INSPECTION AND RENEWAL

ADDENDUM NO. 1

City of St. Augustine, Florida

ADDENDUM NO. 2

**RFP NO. PW2020-06 SANITARY SEWER CLEANING,
INSPECTION AND RENEWAL**

Date: February 28, 2020

To: All Prospective Respondents and Others Concerned

Subject: Addendum No. 2 to Proposal Documents

This addendum is hereby incorporated into the Proposal documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~striketrough~~.

The Respondent shall acknowledge receipt of this addendum by completion of the acknowledgement form in the solicitation document. Acknowledgement must be completed and included with the Submittal Package.

The Proposal documents for the subject project are hereby amended as follows:

CLARIFICATIONS:

A. The solicitation time frames have changes as follows:

- 3/02/2020 – Last day for questions/ clarifications
- 3/05/2020 – Final Addendum issued
- 3/10/2020 – Proposals due by 2:00 p.m. EDT
- 3/10/2020 – Proposals will be publicly opened at 2:15 p.m. EDT
- 3/24/2020 – Evaluation Committee Meeting 10:00 a.m. EDT
- 3/31/2020 – Oral Presentations 10:00 a.m. EDT
- 4/07/2020 – Negotiations 10:00 a.m. EDT

DELETIONS/ADDITIONS:

A. Unit Price Schedule in section- Cleaning and Inspection of Sanitary Sewers, Light, Medium and Heavy Cleaning:

1. Items LC2 and LC4, MC2, MC4, HC2, and HC4:
Delete: ~~to~~ from Item description
Add: \geq (greater than) to Item description

B. Unit Price Schedule in section- CCTV Inspection:

1. Item TV1-
Delete: ~~50~~ from Item description

Add: 300 to Item description

2. Items TV2 and TV4:

Delete: ~~to~~ from Item description

Add: ≥ (greater than) to Item description

C. Unit Price Schedule in section- Sanitary Sewer Service Lateral CIPP Lining:

1. Item LL1a-

Delete: ~~32~~ from Item description

Add: diameter Lateral, nominal 4.5 mm, 16" to Item description

2. Item LL1b-

Add: diameter Lateral to Item description

3. Item LL2-

Add: a to Item number, diameter to Item description

4. Item L3a-

Add: L to Item number, diameter and with end seals to Item description

5. Item LL3b-

Delete: ~~3b~~ from Item number, ~~4~~ from Item description

Add: 2b to the Item number and 1.5, .5, 6 to Item description

6. **Add** new Line Item:

<u>LL3b</u>	<u>Price for each 1 mm thickness increase exceeding 4 mm nominal, 4" diameter</u>	<u>1</u>	<u>LF</u>	
-------------	---	----------	-----------	--

7. Item LL3c-

Delete: ~~LF~~ from Unit column

Add: EA to Unit column

8. **Add** new Line Items:

<u>LL4a</u>	<u>4" diameter Lateral, One-piece main/lateral connection, nominal 4 mm, with a 16" main and lateral insertion not to exceed 20 feet both with end seals</u>	<u>100</u>	<u>EA</u>	
<u>LL4b</u>	<u>Price for each 1 mm thickness increase of the One-piece main/lateral connection (LL4) exceeding 4 mm nominal, 4" diameter</u>	<u>1</u>	<u>EA</u>	

D. Scope of Work- Section 02771, CURE-IN-PLACE PIPE FOR SANITARY SEWER RENEWAL paragraph 2.02.D.:

- 1. Add:** the word nominal at the end of the second sentence. The revision will now read "less than 4.5 millimeters nominal."

RESPONSES TO PROPOSER'S QUESTIONS:

Q1. Page 7, #8 Minimum Qualifications:

Letter G., H., and Q., exactly how do you need us to provide proof of completion, references, job description, etc.?

A1. Documentation of minimum qualifications that address experience for all items that list defined quantities of experience including the referenced items G., H., and Q., may be done with the completed projects document. This document should include as a minimum; the project title, scope of work that includes specifics of type of work performed, quantities, dates of performance, client, and owner's contact information. Letters of reference that are required to document qualifications listed under Item 8.a., b., and c. will also need to document performance of some of these completed projects.

Q2. Unit Price Schedule, Addendum #1 Item LL1a, 6" One-piece main/lateral connection with a 32" main and lateral insertion not to exceed 20 feet both with end seals. (All lateral lining companies use 16" main) – 300 EA.

A2. See DELETIONS/ ADDITIONS C.1. above.

Q3. CCTV Inspection – TV1 Lateral Service from Main, 50, 0 to 40 Ft. Did the City mean to use 300 EA or 50 EA? (based on pre-proposal, it makes more sense, The CCTV and Clean number should be the same or higher than the number of laterals that might be lined, since this is part of the investigation.)

A3. See DELETIONS/ ADDITIONS B.1. above.

Q4. LL2 – Suggestion; use the 4.5 mm nominal thickness as part of LL1a and eliminate LL2 (6" x 4.5mm nominal thickness, One-piece main/lateral....)

A4. See DELETIONS/ ADDITIONS C.1., 3., and 4. above. This line item applies to lateral lining only and is not intended for the one-piece main/lateral connection.

Q5. Make line item L3a the same as LL1a, using 4"mm nominal thickness, One-piece main/lateral...

A5. See DELETIONS/ ADDITIONS A.1. and C6. above. Lateral, One-piece main lateral connections and increasing thickness of this fitting.

Q6. On Page 163 of the proposal documents under Section 3.04 Testing (D) 3 – the specification is asking for tensile testing. Tensile testing normally only applies in CIPP pressure pipe applications. Would the City omit the tensile testing spec?

A6. Tensile testing will be required, however, the frequency listed under paragraph 3.04.C will be reduced to one random test on each Work Order issued. The City will determine from which liner this sample will be taken.

Q7. In section 2.02, letter D. (Page 154), the proposal document states, "In no case shall the finished thickness of a cured liner be less than 4.5 millimeters." But 6" CIPP liners (in most cases) will have a nominal 4.5 mm thickness, which will result in LESS than 4.5 finished thickness. Can the owner make an exception for 6" diameter (4.5 mm) finished thickness?

A7. See DELETIONS/ ADDITIONS D.1. above.

Q8. On Page 7: Item 8. MINIMUM QUALIFICATIONS, letter K. states, "The Contractor is always required to have at least one (1) qualified Superintendent on site during all construction activities." Will the City be willing to revise that statement to, "The Contractor, and/or Subcontractor, is always required to have at least one qualified Superintendent on site during all construction activities?"

A8. Yes. The City will revise this Qualification to include "Contractor and/or Subcontractor", provided the Subcontractor's superintendent representing the Contractor onsite has a minimum of five (5) years' experience with the work that they perform, possesses all required safety training certifications, and if applicable, a temporary traffic control certification.

Q9. On Page 161, B. 3. of the proposal documents, specifications state that the Contractor shall submit post CCTV inspection within five (5) working days. If this is just for standard PACP video, five (5) days is achievable. But, if an electronic database is to be provided, can the City extend the time frame to fifteen (15) days?

A9. The City is changing five (5) to fifteen (15) days in the referenced paragraph.

Q10. Per the CIPP specifications (02771) on Page 147, 1.05 Pre-Treatment of Regulated Chemicals to Discharge into Sewer: "Can the treatment of cure water requirements of specification Section 02771 be removed so as to avoid excessive costs on the project?"

A10. In brief, yes. The requirement in Section 02771 Paragraph 1.05.A, to limit the amount of Styrene discharged will remain. The requirement in Section 02771 Paragraph 1.05.C will be changed to require testing of the post-treatment cure water on the first segment lined in each Work Order. Paragraphs 1.05.C.4 and C.6 will be removed. Paragraph 1.05.B will be removed. In Section 02771 paragraph 1.03.A.2, add submittals of the wet-out procedure, cure medium and method.

Q11. LL3b & LL3c - should both be written the same, I suggest LL3c (except use the 4" x 4mm).

A11. See DELETIONS/ ADDITIONS C.6. above.

ATTACHMENTS:

1. REVISED UNIT COST SCHEDULE (SECOND REVISION 02/27/2020)

All other terms and conditions of the original Request for Proposal documents remain the same.

Jill C. Collins
Procurement Specialist

*** * * END OF THIS SECTION * * ***

City of St. Augustine, Florida

ADDENDUM NO. 3

RFP NO. PW2020-06 SANITARY SEWER CLEANING,
INSPECTION AND RENEWAL

Date: March 9, 2020

To: All Prospective Respondents and Others Concerned

Subject: Addendum No. 3 to Proposal Documents

This addendum is hereby incorporated into the Proposal documents of the project referenced above. The following items are clarifications, corrections, additions, deletions and/or revisions to and shall take precedence over the original documents. Additions are indicated by underlining, deletions are indicated by ~~striketrough~~.

The Respondent shall acknowledge receipt of this addendum by completion of the acknowledgement form in the solicitation document. Acknowledgement must be completed and included with the Submittal Package.

The Proposal documents for the subject project are hereby amended as follows:

RESPONSES TO PROPOSER'S QUESTIONS:

Q1. Has any of the proposed budget for 2020 been spent? If so, how much has been spent as of 03-02-2020?

A1. Yes. Part of the budget has been spent. Expenditures as of 03-02-2020, including invoices in process, total \$340,325.00 with another \$63,000.00 encumbered on the City's I & I budget for fiscal year 2019 - 2020.

All other terms and conditions of the original Request for Proposal documents remain the same.

Jill C. Collins
Procurement Specialist

*** * * END OF THIS SECTION * * ***

#PW2020-06

CERTIFICATE AS TO CORPORATION**(This form must be completed and included in proposal submittal under TAB 1
or the Proposal will be determined to be Non-Responsive)**

The below Corporation is organized under the laws of the State of Delaware; is
authorized by law to respond to this Request for Proposals and perform all work and furnish materials
and equipment required under the Agreement, and is authorized to do business in the State of Florida.

Corporation name: Insituform Technologies, LLCAddress: 17988 Edison Avenue, Chesterfield, MO 63005Registration No.: Florida Registration No. M12000000304Registered Agent: Corporation Service Company 1201 Hays St. Tallahassee FL 32301By: Janet HassContracting & Attesting Officer

(Official title)

(Affix corporate seal)

Attest: Ursula J. Young(Secretary)
Contracting & Attesting Officer

The full names and business or residence addresses of persons or firms interested in the foregoing
Proposal as principals or officers of Respondent are as follows (specifically include the President,
Secretary, and Treasurer and state the corporate office held of all other individuals listed):

Ralph E. Western, President 17988 Edison Ave, Chesterfield, MO 63005David F. Morris, Exec. Vice President 17988 Edison Ave, Chesterfield, MO 63005Mark A. Menghini, Sr. Vice Pres and Sec'y 17988 Edison Ave, Chesterfield, MO 63005Kenneth L. Young, Sr. Vice Pres, Treasury & Tax 17988 Edison Ave, Chesterfield, MO 63005

See attached Board of Managers and Officers for other corporate offices held.

Identify any parent, subsidiary, or sister corporations involving the same or substantially the same
officers and directors that will or may be involved in performance of the Project, and provide the
same information requested above on a photocopy of this form.

Not Applicable

If applicable, attach a copy of a certificate to do business in the State of Florida, or a copy of the
application that has been accepted by the State of Florida to do business in the State of Florida, for
the Respondent and/or all out-of-state corporations that are listed pursuant to this form.

**AFFIDAVIT AS TO NON-COLLUSION AND CERTIFICATION OF
MATERIAL CONFORMANCE WITH SPECIFICATIONS**

**(This form must be completed and included in proposal submittal under TAB 1
or the Proposal will be determined to be Non-Responsive)**

STATE OF MISSOURI
COUNTY OF ST. LOUIS

I, the undersigned, Janet Hass, being first duly sworn, depose and say that:

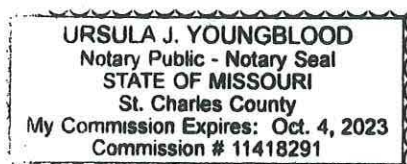
1. I am the owner or duly authorized officer, representative, or agent of:
Insituform Technologies, LLC,
the Respondent that has submitted the attached Proposal.
2. The attached Proposal is genuine. It is not a collusive or sham Proposal.
3. I am fully informed respecting the preparation and contents of, and knowledgeable of all pertinent circumstances respecting the attached Proposal.
4. Neither Respondent nor any of its officers, partners, owners, agents, representatives, employees, or parties in interest, including this affiant, has in any way colluded, conspired, connived, or agreed, directly or indirectly, with any other Respondent, firm, or person to submit a collusive or sham Proposal in connection with the Agreement for which the attached Proposal has been submitted, or to refrain from bidding in connection with such Agreement, or has in any manner, directly or indirectly, sought by agreement, collusion, communication, or conference with any other Respondent, firm, or person to fix the price or prices in the attached Proposal of any other Respondent, or to fix any overhead, profit, or cost element of the Proposal prices or the Proposal price of any other Respondent, or to secure through collusion, conspiracy, connivance, or unlawful agreement any advantage against the City or any other person interested in the proposed Agreement.
5. The price(s) quoted in the attached Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Respondent or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.
6. No official or other officer or employee of the City, whose salary or compensation is payable in whole or in part by the City, is directly or indirectly interested in this Proposal, or in the supplies, materials, equipment, work, or labor to which it relates, or in any of the profits therefrom.
7. Any materials and equipment proposed to be supplied in fulfillment of the Agreement to be awarded conform in all respects to the specifications thereof. Further, the proposed materials and equipment will perform the intended function in a manner acceptable and suitable for the intended purposes of the City.

Signature: *Janet Hass*
Title: Contracting & Attesting Officer

Ursula J. Youngblood

Subscribed and sworn to before me this 2 day of March, 20 20.

Notary Public, State of Missouri at Large
My commission expires:
(SEAL)



PERFORMANCE AND PAYMENT BOND

Surety Number _____
City of St. Augustine Contract Number _____

BY THIS BOND, we, _____, whose address is _____
_____, (“Principal”), and _____
whose address is _____, a corporation organized
under the laws of the state of _____ and licensed to do business in the state of Florida (“Surety”), bind
ourselves and our heirs, personal representatives, successors, and assigns, jointly and severally, unto the City of St.
Augustine (“City”), whose mailing address is P. O. Box 210, St. Augustine, Florida 32084-0210, for the use and
benefit of claimants, as defined in Section 255.05(1), F.S, in the amount equal to one hundred twenty-five percent
(125%) of Total Proposal Cost, for the payment of which sum will and truly be made.

THE CONDITION OF THIS BOND is that if Principal:

- 1. Performs the work described in these contract documents, which are incorporated into this bond by
reference, at the times and in the manner prescribed in the contract; and
- 2. Promptly makes payment to all claimants supplying Principal with labor, materials, or supplies, used
directly or indirectly by Principal in the prosecution of the Work described in the contract, and
- 3. Pays the City all losses and damages, expenses, costs, and attorney’s fees, including appellate
proceedings, that the City sustains because of a default by Principal under the contract; and
- 4. Performs the guarantee of all work and materials furnished under the contract for the time specified in
the contract, then this bond is void; otherwise it remains in full force.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and
time limitation provisions in Section 255.05(2), F.S.

Any changes in or under the contract documents (which include the plans and specifications) and
compliance or noncompliance with any formalities connected with the contract documents or the changes do not
affect Surety’s obligation under this bond, and Surety hereby waives notice of any such changes. Further, Principal
and Surety acknowledge that the Penal Sum of this bond shall increase or decrease in accordance with approved
changes or other modifications to the contract documents.

IN WITNESS WHEREOF, Principal and Surety have executed this instrument under their several seals on
this _____ day of _____, 20____, the name and corporate seal of each corporate party being hereto
affixed and this Bond fully signed by each party’s undersigned representative, pursuant to authority of its governing
body.

Signed, sealed and delivered in the presence of:

Principal	By: _____
_____	_____
(Official title)	(Typed name) (SEAL)
Surety	By: _____
_____	_____
(Official title)	(Typed name) (SEAL)

(Countersignature by Florida Registered Agent)

NOTE: If Principal and Surety are corporations, the respective corporate seals should be affixed and attached.
Attach a certified copy of power of attorney appointing individual attorney-in-fact for execution of Payment Bond
on behalf of Surety

#PW2020-06

QUALIFICATIONS - GENERAL

**(This form must be completed and included in proposal submittal under TAB 1
or the Proposal will be determined to be Non-Responsive)**

As part of the Proposal, Respondent shall complete the following so that the City can determine Respondent's ability, experience, and facilities for performing the Work.

Name of Respondent: Insituform Technologies, LLC

Respondent's tax identification No.: 13-3032158

Year company was organized/formed: January 12, 2012

Number of years Respondent has been engaged in business under the present firm or trade name:
8

Total number of years Respondent has experience in similar work described in Item 8 of the Instructions to Respondents: 39

Has Respondent previously been engaged in the same or similar business under another firm or trade name? If so, please describe each such instance.

Insituform Technologies, Inc. 12/9/1992 - 12/31/2011

Insituform of North America, Inc. 3/27/1980 - 12/9/1992

Has Respondent ever been adjudicated bankrupt, initiated bankruptcy, or been the subject of bankruptcy proceedings on behalf of the current entity submitting this Proposal or a prior entity that Respondent substantially operated or controlled? If yes, please describe the nature and result of those proceedings and the entity involved.

No

Describe the background/experience of the person or persons who will be primarily responsible for directing the Work that will be performed pursuant to this Proposal. This inquiry is intended to encompass the project manager and/or superintendent who will be engaged on a daily basis in directing performance of the Work.

Brandt Curvel will be the project manager for any work being performed for the City
of St. Augustine under RFP PW2020-06. Mr. Curvel has been with ITL for over 10
years and has extensive experience with trenchless rehab technologies. Kevin Morrell
will be the superintendent and has been lining pipes with ITL for over 20 years.

BACKGROUND AND QUALIFICATIONS



Insituform Technologies, LLC is pleased to deliver to the City of St. Augustine our qualifications submittal for the Sanitary Sewer Cleaning, Inspection and Renewal Request for Proposal No. PW2020-06. As the city implements this next phase of rehabilitation work, you need a partner that has the highest level of expertise and experience, and one can overcome the inevitable unknowns that will arise, without compromising schedule, budget or quality that the city has come to know and expect from Insituform. In response, we have assembled a submittal to meet/exceed the criteria for the city's RFP.

Our team consists of seasoned experts and construction professionals that have the experience, dedication and reputation to deliver successful projects from start to finish. Collectively, we are dedicated to executing projects that not only maximize value for the city, but also minimizes disruption to its residents.

Not only is Insituform the creator and industry leader in the field of cured-in-place pipe (CIPP), our experience is second to none regarding pipeline rehabilitation, I/I reduction, and meeting the needs of our valued municipal clients. To date, Insituform crews have successfully installed well over 25,000 miles of CIPP (over one hundred million linear feet).

As you evaluate the submittals, we ask that you keep the following key advantages of the Insituform team in mind:

45+ Years of Innovation – Insituform invented the cured-in-place pipe (CIPP) process nearly 50 years ago and continues to innovate the trenchless sewer rehabilitation industry. We're not only the worldwide leader in CIPP pipelining, but also the only ISO certified installer and manufacturer of CIPP in North America. Insituform is also the only CIPP manufacturer to obtain OSHA's Voluntary Protection Program Star status.

Unparalleled Experience – Insituform has used CIPP to rehabilitate over 25,000 miles of underground pipelines with little to no disruption. Insituform is backed by the financial stability of parent company Aegion Corporation, a publicly traded company whose subsidiaries specialize in the rehabilitation and protection of pipelines and other infrastructure worldwide.

We are Accountable – As a vertically integrated company, Insituform controls every step in the pipe protection and rehabilitation chain from product development to engineering to manufacturing and installation. We take complete responsibility for our solutions and our ISO:9001 certification covers everything from the manufacturing of CIPP liner to all aspects of installation, design development, corporate functions and preparation of CIPP. Our professionals take great care to follow strict standards and boast some of the highest safety ratings in the industry. Our corporate safety policy is to provide an accident-free work environment and we work diligently to adhere to this policy on a daily basis. Our "Big Five" policy, which covers confined space and underground pipeline safety procedures, forms the basis of our safety program and accident-free safety culture.

Insituform and our subcontracting partners are committed to providing the strongest level of rehabilitation services, constructed with the highest standards expected by the City of St. Augustine and its constituents – consistent with our past performance with the City. Regardless of our global experience, our local knowledge of the Florida environment and needs of the municipalities in the area is a top priority. We've been fortunate enough call many of the area's municipal entities our clients and enjoy a long-standing history of success in rehabilitating the area infrastructure.

BACKGROUND AND QUALIFICATIONS



In the State of Florida, Insituform holds approximately 15 term contracts annually, including local term contracts with the City of Palm Coast, Jacksonville Electric Authority, City of Jacksonville, City of Daytona Beach, and St. John's County. Our experience bidding, managing, and successfully executing annual contract work is unmatched.

Insituform has a thorough understanding of the needs, goals, and objectives of performing on annual contracts, based not only on our global industry leading resources, personnel, technology and experience, but locally from the project experience we've gained from area projects dating back to the 1990's.

Rest assured, our industry leading approaches will incorporate our core values:

1. Zero Incidents are Possible
2. Do What's Right
3. We Solve Problems
4. Results Matter
5. Be Better



The enclosed **Background and Qualifications** section and supporting documents aim to not only fulfill the minimum requirements of the RFP, but also serve to document and quantify our industry leading experience, corporate values, including our commitment to safety, financial resources, and qualifications and are organized by Evaluation Criteria, supplemented by the required RFP forms and additional experience data:

Main/Lateral Rehab & Inspection Experience

Insituform is approaching the 50th anniversary of coming to market with the Cured-in-Place technology, primarily used in main line lining and has since installed over 25,000 miles of CIPP. We currently install approximately 120,000 linear feet per week across North America and inspect/install nearly 1 million linear feet annually in the state of Florida alone. Along the way, we also developed and came to market with the CIPP technology for lateral lining. Our industry experience in the manufacturing and installation of both main line and lateral CIPP liners is unparalleled. In addition, we've partnered with BLD Services, the global leader in lateral liner installations, who acquired Insituform's lateral lining division in 2009. Since then, BLD has inspected/installed over 100,000 lateral liners. Insituform and BLD have hands down the most experience of any contractor in the industry and have successfully partnered together on over 250 projects over the past five years.

For this contract, Insituform will lean on two trusted subcontractors for the pipeline cleaning and inspection portion. Proline Vactor Services (Proline) and Underground Pipeline Rehab (UPR) are both long-time trusted subcontractors that we have worked with extensively for over a decade throughout Florida and Georgia. To date, we've completed over 220 projects with UPR and over 240 projects with Proline.

Needless to say, with over 200 projects completed with each of our lateral rehab and inspection partners our team is well versed in making rehabilitation projects run smoothly together.

BACKGROUND AND QUALIFICATIONS



A small sample of our collective regional experience is contained below.

Past Performance

Insituform has been pleased to serve the rehabilitation needs of the City of St. Augustine for nearly a decade. In that timespan, Insituform has successfully completed 20+ projects in both sanitary and stormwater systems, including some unique applications and a few special projects with The Florida School for the Deaf and Blind. Our commitment to continuing the successes of past projects will continue on all future projects with the city, in continuation with the high caliber of performance that St. Augustine has come to know us for.

Approach to Safety

From the corporate office to the field crews, safety is a cornerstone of the Insituform/Aegion business plan. We dedicate substantial time and resources into the training that is necessary to complete projects without incident. Safety is not just a priority to the Insituform team – it is embedded in our culture, manifested at all levels from manufacturing to wet out and installation, and infused into all members of our project teams. Our manufacturing and installation processes have been developed to not only achieve peak product performance but to also ensure safety. This promotes a foundation for safety that is at the root of the Insituform/Aegion culture. It is not just a priority—it is our number one priority.

We currently employ a wide range of safety training programs and protocols, applicable to both long term employees and new hires. The basis of our safety program, known as “The Big Five,” is a comprehensive approach to working in a confined, underground space. Our new hire orientation process includes hands on training in confined space entry (CSE), air monitoring using our specific 4-gas monitor, CSE ventilation, non-entry CSE rescue as well as HAZCOM review and understanding. DOT New Driver Orientation, Decision Driving, Work Zone Traffic Control, as well as the nationally recognized behavioral program Safe Start are all part of the training new employees receive. We are committed to ensuring our employees are safely and properly trained from Day 1.

In addition to our required on-the-job training, our crews receive regularly scheduled safety training. We have a required six-days of annual training conducted on a quarterly basis for every employee. This training involves both classroom and hands-on training conducted by outside professional trainers and by our in-house senior management who pass on their experience and knowledge to the crews. We also continue with behavior-based programs and have added training for soft-tissue fatigue prevention. Our crewmembers are trained in First Aid/ CPR. Safety managers are OSHA 500 /501 qualified and maintain continuing education from several sources including the ASSE and NASP. During project planning, jobsite surveys are conducted by our Field Engineers and Supervisors prior to crews coming to the site. A plan (AHA/JSA) to address the jobsite setup (job footprint) is developed addressing potential hazards i.e. traffic conditions, pedestrian movement, utilities conflicts, etc. This plan is initiated and adjusted during the project as conditions dictate.

Insituform also maintains a Drug-Free Workplace. All of our current employees have undergone a

BACKGROUND AND QUALIFICATIONS



series of screenings to determine their ability to meet our employee standards. Pre-employment drug testing and MVR screening as well as other criteria were part of this selection and employment process. Our program includes pre-employment testing, post incident testing and random screening.

At various levels of management on our projects, managers and supervisors are required to implement and maintain an Injury and Illness Prevention Program (IIPP). The purpose of this program is to ensure the following safety criteria and responsibilities are met.

All subcontractors of Insituform and their personnel are subject to the same safety policies and procedures while working on Insituform projects. We are committed to partnering with our

subcontractors and other team members to ensure that our policies and procedures are communicated clearly, effectively, and are adhered to on a daily basis.

Confined space entry poses one of the most significant risks associated with sewer projects, especially with projects involving manned entry into manholes, or medium/large diameter pipelines. As such, our mandatory “Big Five” Confined Space Entry program/protocol is implemented each and every time there is a confined space entry.

“The Big Five” includes the following regulations:

1. All entrants must wear a harness and fall protection (SRL) device when being lowered into or raised from a confined space.
2. All entrants must be hooked to a lifeline/retrieval system.
3. A confined Space Entry Permit must be prepared and approved prior to entry.
4. Mechanical ventilation must be operating 100% of the duration of the entry.
5. An approved and functioning gas meter for testing or monitoring the confined space must be utilized for 100% of the duration of entry

To further our commitment to maintaining and improving safety, our Near-Miss Program receives input from field crews to generate Safety Alerts that are broadcast via our company intranet to all employees reinforcing our Safety Awareness Program. We also employ a program we call Safety Culture Day. Our managers conduct monthly field visits with our crews to discuss safety topics and safety issues relating to our projects. This program has been successful in bridging the lines of communication and will continue to be implemented on this project. We invite and encourage all subcontractors and City of St. Augustine personnel to attend all safety meetings and Safety Culture Day programs.

Although all our crew members are trained in First Aid/CPR procedures, non-emergency response is directed and maintained through our contracted health and injury care provider Health Bridge. They will triage and direct the injured party to the most immediate and appropriate care within the area. Prior to beginning any construction activities and as a part of developing our site-specific safety plan, we will meet with the emergency services in the area to confirm the location of the closest emergency

BACKGROUND AND QUALIFICATIONS



services and the location of the closest fire department containing a high angle/technical rescue team. We will review the scope of this project to ensure they understand all aspects including, but not limited to, Maintenance of Traffic, ingress/egress points and working hours.

However, in the event of an emergency, cases will be directed through local EMS. Site supervisors will be provided the confirmed locations of local medical facilities. Contact numbers of supervisors will be also distributed to all employees working in each particular work segment on each day.

Experience with Event Coordination

We have extensive experience in the planning and execution of projects around event coordination and fully understand the importance of preserving the success of those events. Historically, this has been achieved by a

multitude of approaches including altering and compressing schedules, 3rd shift/night work, utilizing sound attenuated equipment, odor masks, adding additional crew resources to expedite completion, and public outreach programs.

Specifically, we've coordinated rehabilitation projects with special events such as Daytona Bike Week, The Daytona 500 race week, events at Jacksonville's Landing downtown, and a multitude of projects at Walt Disney World – perhaps one of the toughest clients to schedule and coordinate projects with due to access, operations, and event coordination both inside the parks and behind the scenes.

Experience with Narrow Streets and Restricted Access

A few examples of experience with projects having narrow streets or restricted or challenging access are:

- **City of St. Augustine** – we have completed over 20 projects for the City of St. Augustine, many of which took place in the crowded and narrow streets
- **Town of Palm Beach** – for this project, located along a narrow bike path and adjacent to a seawall on the intercoastal waterway we created a specialty equipment package that would fit in the tight space and allowed for minimal disruption, and avoided having to remove expensive landscaping
- **City of Savannah** – we have completed several projects for the City of Savannah, who like St. Augustine, is a historical city with narrow streets and challenging access areas and our project experience there had very similar conditions to those found in St. Augustine
- **West Palm Beach Force Main** – this was a large force main project that started in a condo complex and spanned several fairways of a high-end country club. Tournaments and full golf access needed to be maintained throughout the project, which also included seven excavations and three sets of 24" HDPE bypass lines.
- **Magic Kingdom** – This project took place in the vacuum lines that convey trash from the “onstage” or public side to the “offstage” or behind the scenes side. Careful coordination was required, as well as specific timing of the installation. Access was challenging due to the small working space on the onstage end, as well as tight access behind the scenes.

BACKGROUND AND QUALIFICATIONS



- Disney Animal Kingdom – This project lasted approximately three years and was spent rehabilitating storm lines throughout the park – on both the “offstage” and “onstage” areas. Careful coordination was needed, as much of the “offstage” work took place when the public was around. Special odor masks were utilized to eliminate the presence of a heavy lining operation.
- Blizzard Beach – this was a water main project that took place with one end of the install on the “offstage” side, and the other on the “onstage” side. Access was very restricted and there was minimal room to work on the “onstage” side. Operations needed to commence after the park closed, and needed to finish prior to re-opening, so operations need to be efficient and staged over a few days.

Ability to Attend to Safety or Environmental Emergencies

Insituform understands that no matter how much planning and careful execution goes into construction work, there are issues that arise on occasion. Because of our vast experience and close proximity to the City of St. Augustine, we have the ability to respond to safety or environmental emergencies quickly and efficiently. We’re experienced working closely with municipalities on their protocols, follow all OSHA standards, and effectively formulate plans in advance so that issues can be remediated properly and immediately. To assist in this process, we’ve outlined a “Who Do You Call” list that has all of our relevant field and office contacts, emergency response contacts, as well as city official contacts – these documents are attached below.

Equipment and Availability

As the largest provider of Cured-in-Place Pipe (CIPP) rehabilitation services in the world, one of our biggest strengths lies in our resources and crew capacity. Insituform utilizes some of the newest and well-maintained equipment in the industry. In the State of Florida alone, Insituform employs six to seven experienced crews, two and often three of which are based out of the Jacksonville office. Additional Insituform crews are located in Tampa, and Miami, FL, throughout the Southeast United States, and around the country. Should the need for additional crews arise, we have the ability to rotate crews in and out, and shift resources to areas and projects that need them the most. Insituform’s equipment fleet, crew count, material manufacturing, and wetout resources are hands down the most robust in the industry.

As a vertically integrated company, we employ the finest in-house resources for engineering/design, manufacturing, wetout, and installation and control every step of the process. So, if a project needs to be expedited, we can speed liner manufacturing and wetout processes to ensure timely installation and project completion. When competitors have needs or issues, there are a variety of manufacturers, suppliers, wetout locations and installers involved to navigate through, which can be messy and involve a lot of finger pointing. If there is a need to problem solve with Insituform, you have one point of contact, and a single source working in concert to solve problems and meet client needs.

Operations for all CIPP/rehabilitation projects in North Florida are handled out of our offices in Jacksonville, which provide adequate resources for our current and estimated future workloads. We are fully committed and capable of handling 100% of the work on the City of St. Augustine’s annual rehabilitation contract both short and long-term. Our crews are also some of the most efficient in the industry, all while maintaining industry leading quality standards, maintained by our ISO:9001 manufacturing, wetout, and installation processes – a

rare combined offering in our industry.

BACKGROUND AND QUALIFICATIONS



Maintenance of Traffic and Bypass Experience

Because of Insituform's vast experience with both lateral lining as well as manhole-to-manhole lining, spanning almost 50 years, we have a significant amount of experience handling the Maintenance of Traffic (MOT) and bypass needs on our projects. Depending on the severity of the scope, these functions can either be handled in-house by our trained and certified crew members, or it can be subcontracted out to one of our many traffic control or flow management subcontractors. Our experience has taught us what we're comfortable handling in-house, and when it's best to employ the services of a specialty subcontractor.

A variety of our staff and crew members carry traffic control certifications. Ensuring proper MOT standards are followed is paramount for the safety of our crews, and the general public – and is an extremely high priority. Our company is a steward of proper traffic control plans, the use of flaggers where necessary, and following all permitting procedures for ensuring a safe and comprehensive traffic control plan is designed, constructed, and removed in a timely manner. On more complex traffic control setups, we often subcontract that portion to our traffic control subs, who specialize in the design and implementation of these systems. The result is a well prepared, properly executed traffic plan no matter the size.

Our crews carry ample pumps and bypass hose, including redundant equipment to ensure the safe conveyance of flow for lining operations. We also spend a significant amount of time planning and prepping each project, each work order, and each installation to ensure we know the needs of each particular line segment to be bypassed. This emphasis on preparatory work ensures we have a comprehensive understanding of the variables involved – such as whether there are force mains involved, flow level variances, service count, commercial impact on flows, etc. Our communication with owners and engineers also ensures we're on the same page as far as the systems needs, and to guarantee our flow management systems succeed.

Supporting Background and Qualifications documentation and forms are attached.

CIPP Lining Experience



Insituform Technologies Installation Experience 8" through 24"; Florida; 2017-2019	
Project Name	Sum of Actual Linear Feet
NAPLES,FL PO1700725-00	8,615
NAPLES,FL PO1800439-00	8,173
JACKSONVILLE FL,PO307753:15	2,392
JACKSONVILLE FL,PO307753:16	2,018
JACKSONVILLE FL,PO307753:17	1,145
JACKSONVILLE FL,PO307753:18	399
JACKSONVILLE FL,PO307753:20	1,888
JACKSONVILLE FL,PO307753:21	1,364
JACKSONVILLE FL,PO307753:22	1,425
JACKSONVILLE FL,PO307753:23	2,385
SARASOTA COFL,W14,16,17,18,20	3,580
SARASOTA COFL,WA22,OXFORD PT	6,951
SARASOTA COFL,WA23,TROPICAL C	3,421
SARASOTA COFL,WA24,STICKNEYPT	6,683
SARASOTA COFL,WA25,SANDERLING	4,814
SARASOTA COFL,WA26,DOLPHIN BA	2,524
SARASOTA COFL,WA27,COLLINS	4,264
SARASOTA COFL,WA28,BROOKHAVEN	1,815
SARASOTA COFL,WA29,SOMERVILLE	1,300
SARASOTA COFL,WA30,COUNTRY PL	3,567
SARASOTA COFL,WA31,SE PLAZA	1,711
SARASOTA COFL,WA32,SHADOWLAWN	2,354
SARASOTA COFL,WA33, PLANT	2,302
SARASOTA COFL,WA34,OYSTERCOVE	10,167
SARASOTA COFL,WA35,AVENIDADEL	12,449
SARASOTA COFL,WA36,CANAL ROAD	3,863
SARASOTA COFL,WA39,CANAL ROAD	4,481
PUNTA GORDA FL,REQUISIT59934	534
PINELLAS COFL,VARI LOCATIONS	3,667
CLAY COTSK ORD29,MEADOWBROOK	24,448
CLAY COTSK ORD30,PRJ01018RR	7,544
CLAY COTSK ORD31,GREENWOOD	14,184
MIAMI-DADE COS-866 ISSUANCE03	30
MIAMI-DADE COS-866 ISSUANCE05	48
MIAMI-DADE COS-866 ISSUANCE06	1,176
MIAMI-DADE COS-866 ISSUANCE09	477
MIAMI-DADE COS-866 ISSUANCE10	265
MIAMI-DADE COS-866 ISSUANCE12	2,469
MIAMI-DADE COS-866 ISSUANCE13	7,468
MIAMI-DADE COS-866 ISSUANCE14	12,846
MIAMI-DADE COS-866 ISSUANCE15	25,414
MIAMI-DADE COS-866 ISSUANCE16	12,769

CIPP Lining Experience



MIAMI-DADE COS-866 ISSUANCE17	32,106
MIAMI-DADE COS-866 ISSUANCE18	23,615
MIAMI-DADE COS-866 ISSUANCE19	13,133
MIAMI-DADE COS-866 ISSUANCE20	39,316
MIAMI-DADE COS-866 ISSUANCE21	25,645
MIAMI-DADE COS-866 ISSUANCE22	21,618
MIAMI-DADE COISSUANCE 2425	29,999
RIC-MAN INTERNL MIAMI BEACH	1,457
WEST PALM BEACH FL,PARKER AVE	612
WEST PALM BEACH FL,PARKER AVE	836
WEST PALM BEACH FL,CLEARWATER	2,118
LARGO FL,SANIT STORM	8,565
LARGO FL,PO68989,SANITSTORM	23,134
JOHNSON-DAVIS,PALM BEACH CO FL	3,209
CORAL GABLES FL,IFB20151007	13,186
CORAL GABLES FL,LEUCADENDRA 2	1,685
JEA, RELEASE1,VAR LOC	3,867
JEA,REL2, VARIOUS LOC	2,929
JEA,REL3,BUCKMANN EMERG	204
JEA,REL4,BUFFALO,WOODSONG	2,220
JEA,OLIVE ST,PO177612	330
JEA,CARLOTTA RDW VARI LOC	955
JEA,ARLINGTON E,PO180964	281
JEA,FY19 BUSH DR,PO181382	623
JEA,FY19 5TH ST,PO182511	742
JEA,FY19,CLUDELEWIS,PO183111	480
JEA,FY19,ORTEGAFOREST,PO183115	1,228
JEA,FY19,COPELAND ST,PO183116	829
JEA,FY19,PO182290,91,92	298
JEA,BEAVER STLINING,PO183678	2,895
JEA - FL - UNIVERSITY BLVD	984
SKANSKA-GRANITE-LANE JOINT VEN	2,108
NORTH BAY VILLAGE FL,LINING	6,279
ST AUGUSTINE FL,CHARLOTTE ST	1,250
UTILITIES INC OF FL ,PARENT	3,771
UTILITIES INC OF FLORIDA,REL1	3,057
POMPANO BEACH FL, REL1	15,611
POMPANO BEACH FL, REL2	530
POMPANO BEACH FL, REL3	3,277
POMPANO BEACH FL,REL1,FY 2018	10,977
POMPANO BEACH FL,STORM,FY 2018	1,424
POMPANO BEACH FL,VARILOCATION	8,846
POMPANO BEACH FL,TO2,PO191308	425
POMPANO BEACH FL,T13,PO191344	655
SARASOTA FL,HARBOR ACRES	12,549
SARASOTA FL,BAY POINT PARK	9,430
SARASOTA FL,FRUITVILLE RD	9,719
SARASOTA FL,BAYSHORE ALAMEDA	10,706

CIPP Lining Experience



SARASOTA FL,FLOYD STBID1649CM	4,441
SARASOTA FL,YR3,WA1BID1649CM	15,437
SARASOTA FL,YR3,WA2 BID1649 CM	18,043
RIPA ASSOC,TARPON SPRING FL	418
ST PETE BEACH FL,RELEASE 2	16,671
ST PETE BEACH FL,RELEASE 3	6,054
ST PETE BEACH FL,R4,22ND58T	666
ST PETE BEACH FL,R6,LINING	2,787
ST PETERSBURG FL,FY17-PHASE 1	35,949
ST PETERSBURG FL,PO197179	80,916
MIAMI-DADE CO,RPQP0193,REL1	27,001
MIAMI-DADE CO,RPQP0193,REL2	27,865
MIAMI-DADE CO,RPQP0193,REL3	18,386
MIAMI-DADE CO,RPQP0193,REL4	9,443
PINELLAS COFLINTERCEPTOR,SS	4,641
RAM-TECH CONSTR CORAL GABLES	361
TAMPA FL,PO117214640	175
ST JOHNS COUNTY,MISC17-58	406
ST AUGUSTINE, WO 11	1,178
G H UNDERGROUND,JAX BEACH FL	150
AMELIA ISLAND PLANTATION COMM	69
ST AUGUSTINE,WO 12, BASIN 51	9,666
CAPE CORAL FL, PO53941	12,393
CAPE CORAL FL, PO55001	29,697
JD WEBER CONST, DAYTONA, FL	101
JD WEBER CONST, NEW SMYRNA	5,553
HODGES BLVD DEVELOPMENT GROUP	326
BOYNTON BEACH FL,PHASE 51	2,708
BOYNTON BEACH FL,PHASE 52	12,590
BOYNTON BEACH FL,LEISUREVILLE	563
HYDRA ENGINEERING CONST,LLC	18,023
FLORIDA DOT, COLUMBIA CO FL	2,563
FT LAUDERDALE FL,RIO VISTA	7,496
NASSAU CO BOARD OF CO COMM	1,205
ABBA CONSTRUCTION,MACDILL AFB	385
DEERFIELD BEACH FL, 2017 REHAB	20,188
DEERFIELD BEACH FL,2017/2018	4,764
DEERFIELD BEACH, FL - WO2	2,509
ST JOHNS COUNTY,MISC17-111	3,819
HIALEAH FL, FY2017 PROJECT	6,697
JACKSONVILLE BEACH FL,PO037164	1,707
PRINCE CONTRACTING - US 17	306
POOLE KENT CONTRACTORS,WPB	945
MACCLENNY FL,EMERGENCY REPAIR	204
ORANGE PARK COUNTRY CLUB OA	357
JOHNSON-DAVIS, - KISSIMMEE, FL	830
ORANGE PARK, FL 2 LOCATIONS	664
ORANGE PARK FL,POPO08609	380

CIPP Lining Experience



LAKEWOOD RANCH IDA, POPO-1851	235
HUBBARD CONST, ORANGE COUNTY FL	175
TOHOPEKALIGA WATER AUTH, V LOC	89,266
WRIGHT CONSTRUCTION GROUP	940
HIALEAH FL, WO1, BASINS 008/106	8,815
HIALEAH, FL - WO2, BASIN 150	13,224
HIALEAH FL, WO3, LS 127	3,611
NEW SMYRNA BEACH, RIVERSIDE DR	568
RTD CONSTRUCTION, CLEARWATER FL	50
LAUDERHILL, FL 2018-002 WO1	3,164
LAUDERHILL, FL 2018-002 WO2	3,736
LAUDERHILL, FL 2018-002 WO3	2,751
GH UNDERGROUND CONBARACOA CT	220
CATHCART CONSTRUCTION, LONGWOOD	2,780
NASSAU CO BRD OF CC, NASSAU CO	498
MASCI GENERAL CONTRFDOT T5506	2,471
AJ JOHNS, JACKSONVILLE FL	117
CORAL GABLES FL, LEUCADENDRA12	7,634
CORAL GABLES FL, BELLA VISTA 2	24,868
REEDY CREEK IMPRVMT LIFT STA	1,286
NORTH PORT FL, WORK ASSIGN5	19,189
INFRAMARK, PORT ST LUCIE FL	4,771
SEMINOLE CO BCC, LINDEN RD	1,239
HOMETOWN AMERICA, ORLANDO FL	6,495
FLUOR FEDERAL SOLUTIONS NAS	390
TOHO WATER AUTH, BB B15	260
WATSON CONSTRUCTION, GAINESVILL	150
ORANGE PARK FL, POPO09868	302
MAER CONSTRUCT, ORANGE PARK FL	758
NEW SMYRNA BEACH, 8TH STREET	471
PETTICOAT-SCHMITT CIVIL CONTR	322
MIAMI-DADE CO FL, RPQP0217	53,086
DELAND FL, PO23468	528
WINTER HAVEN FL, 2018 PROJECT	2,187
PALM BEACH COFL, P1, PJ15-098A	48,229
UTILITIES INC OF FLOR, LONGWOOD	6,853
FLORIDA SCHOOL OF DEAF BLIND	2,395
MARGATE FL, LS27, FY19-PO190226	7,567
DB CIVIL CONSTRUCTION, ORLANDO	356
NEW SMYRNA BEACH FL, BEACON ST	985
JACKSONVILLE, FL WO1	2,099
JACKSONVILLE FL, P3, SITES 1-10	3,506
VK JENSEN ENTERPR, KISSIMMEE F	365
PRIME CONSTRUCCGRP, OSCEOLA CO	1,238
DB CIVIL CONSTRUCTION, BUNNELL	4,515
MCKINNEY COMMERCIAL CONSTRUCT	255
PINELLAS COFL102ND AVEBRYAN	6,058
PW NORFLEET, GAINESVILLE FL	173

CIPP Lining Experience



NEPTUNE BEACH FL, PO9040	1,650
KIMMINS CONTRACTING, JOB51803	391
WINTER HAVEN FL, 2019 PROJECT	9,244
DB CIVIL CONSTRUCTION, BUNNELL	5,459
COCOA FL, FY2019, PO74636	6,464
SECORD CONTRACTING CORP	290
MACCLENNY FL, S3RDEFLORIDA	351
VE WHITEHURST SONS, NW 43RD	300
TOHO WATER AUTH, EMERG LINING	592
INFRAMARK, NHUTCHINSON ISLAND	5,194
VOGEL BROS BUILDING, TAMPA FL	203
MCKENZIE CONTRA, STPETERSBURG	252
MORLIC ENGINEERING, CORAL GABLE	448
ARCADIS US, TEMPLE TERRACE FL	2,132
MIAMI-DADE COFL, CTS-946, IS1	21,629
HOMETOWN AMERICA-FAIRWAYS SPE	450
MELBOURNE AIRPORT AUTHORITY	85
AMELIA ISLAND PLANTATION COMM	90
WINTER HAVEN, FL-2019 EMERGENCY	332
ALACHUA COUNTY BCC, NW 43RD ST	350
Total LF Installed	1,393,855



Statement of Qualification

BLD Services, LLC (BLD) is a Licensed General Contractor in over twenty-four states including the State of Florida. The BLD Cured-in-Place Pipe (CIPP) Lateral Lining Division is very well positioned to perform work for City of St. Augustine as we have thirty-five installation crews across the Eastern portion of the United States, with five crews in Florida. With our various locations strategically positioned, our focus and goal is to safely and successfully respond to our clients' needs quickly and promptly.

BLD's CIPP Lateral Lining Division has tremendous interest in the potential work that the City of St. Augustine has to offer. BLD's use of both cutting edge and proven technologies, in conjunction with our vast array of experience and more than 800 years of CIPP experience uniquely positions BLD to offer our clients cost-effective and practical solutions to any infrastructure problems they may encounter with its service lateral system. This Lateral Lining Process has been installed in various locations throughout the U.S. over the past ten years as a General Contractor with great success.

BLD purchased the Lateral Lining Division of Insituform Technologies, Inc. in January of 2009. Since this acquisition, BLD has grown to thirty-five rehabilitation crews making us the largest Lateral Lining Contractor in the World. These installation crews service the Eastern half of the United States and have successfully installed over 100,000 laterals in the last 10 years.

Known today as the BLD "Service Connection Seal + Lateral" (SCS+L) this Cured-in-Place Pipe (CIPP) Lateral Lining System is a one-piece lateral lining process that creates a watertight tight seal at the mainline connection along with a structural repair to the lateral line. This process is performed entirely from the mainline and typically without the need for the installation of a cleanout for installation up to 80 feet plus.

The employees performing the work for the City of St. Augustine will be employees of BLD Services, LLC and will not be a licensed installer of a system manufacturer. BLD Services, LLC will install a Manufactured System that has a minimum of a ten (10) year history of satisfactory performance with a minimum of 100,000 CIPP lateral installations.

In addition, BLD Services on-site Superintendent has installed a minimum of 10,000 CIPP laterals of like condition as the City of Sarasota and has a minimum five (5) years of CIPP industry experience.

Sincerely,
BLD Services, LLC



FLORIDA COMPLETED CIPP PROJECTS

Project Name	Owner	General Contractor	City	State	Owner			Long Laterals	Short Laterals	Spot Repairs	CIPP Lateral Footage	Final Contract Amount	Completion Date	BLD Superintendent
					Address	Contact Name	Phone Number							
2008 Annual Contract	City of Ft Lauderdale, FL	Insituform Technologies, LLC	Fort Lauderdale	FL	100 N. Andrews Avenue Ft. Lauderdale, FL 33301	Jean Examond	954-492-2852		568		2840	\$ 227,520.00	04/30/09	McMillion
Delray Beach, FL Term Contract	City of Delray Beach, FL	Insituform Technologies, LLC	Delray Beach	FL	434 S. Swinton Avenue Delray Beach, FL 33444	Scott Solomon	561-243-7309		9		270	\$ 16,269.00	04/30/09	McMillion
Orange County CIPP Term Contract	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	31			754	\$ 77,877.00	05/30/09	Reid
Pinellas Park Rehab Project	Pinellas Park	Insituform Technologies, LLC	Pinellas Park	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	813-299-6319		4		120	\$ 8,400.00	05/30/09	Reid
Insituform Top Hat Demo	City of Jacksonville, FL	Insituform Technologies, LLC	Jacksonville	FL	2434 North Pearl Street Jacksonville, FL 32206	Bill Clendening	904-665-4723		1		2	\$ 1,100.00	06/29/09	McMillion
Colonial Cove 3, 5 & 6 - Term Contract	Manatee County, FL	Insituform Technologies, LLC	Manatee County	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	813-299-6319	113		4	3390	\$ 310,150.00	06/30/09	McMillion
Ft. Myers Annual Contract	City of Fort Myers, FL	Insituform Technologies, LLC	Fort Myers	FL	2200 Second St. Fort Myers, FL 33901	John Jacobs	904-509-1584	9			270	\$ 19,266.00	07/02/09	McMillion
CIPP Lateral Lining Project	City of Lakeland, FL	Insituform Technologies, LLC	Lakeland	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	813-299-6319	2	4		180	\$ 13,650.00	08/05/09	Ladner
Plantation, FL - Piggyback Term Contract	City of Plantation, FL	Insituform Technologies, LLC	Plantation	FL	400 Northwest 73rd Avenue Plantation, FL 33317	Dan Pollio	954-797-2159	150	15		7425	\$ 394,250.00	10/01/09	McMillion
Naples, FL - Piggyback Term Contract	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera	239-213-4721		11		330	\$ 21,725.00	10/01/09	McMillion
Sarasota, FL - Annual Term Contract	Sarasota County, FL	Insituform Technologies, LLC	Sarasota	FL	1001 Sarasota Center Blvd. Sarasota, FL 34240	Rodney Jones	941-861-0506		3	1	90	\$ 7,050.00	10/01/09	McMillion
Orange County Bay Hill	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	13	7		73	\$ 38,859.00	10/05/09	Ladner
Longboat Key, FL - Annual Term Contract	Town of Longboat Key, FL	Insituform Technologies, LLC	Longboat Key	FL	600 General Harris Street Longboat Key, FL 34228	Annie Ross	941-316-1958	3	231		7488	\$ 442,200.00	03/15/10	McMillion
Clay County, FL - CIPP Rehab	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121	14	5		475	\$ 59,067.00	04/15/10	McMillion
Hallandale, FL CIPP Piggyback Contract	City of Hallandale, FL	Insituform Technologies, LLC	Hallandale	FL	400 S. Federal Hwy. Hallandale, FL 33009	Louis Granda	954-458-3251	5			15	\$ 13,500.00	05/05/10	Dalmau
Pompano, FL - CIPP Lining Term Contract	City of Pompano Beach, FL	Insituform Technologies, LLC	Pompano	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamy	954-786-4600	2			60	\$ 6,036.00	05/05/10	Dalmau
Tampa, FL - Sligh Ave & 53rd	City of Tampa, FL	SAK Construction, LLC	Tampa	FL	3522 US 41 North Palmetto, FL 34221	Casey Pieczonka	941-723-2080	1			23	\$ 9,900.00	05/28/10	McMillion
City of Lakeland, FL	City of Lakeland, FL	SAK Construction, LLC	Lakeland	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	813-299-6319	2			21	\$ 7,400.00	05/28/10	McMillion
Naples, FL - Piggyback Term Contract	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera	239-213-4721		9		13	\$ 17,775.00	10/10/10	Dalmau
95th Street Lateral Lining	City of Hialeah Gardens, FL	BLD Services, LLC	Hialeah	FL	7729 N.W. 146th St. Miami Lakes, FL 33016	George Murgade	305-558-4114	2			75	\$ 5,850.00	12/31/10	Dalmau
Casa Blanca Villas- Sarasota FL	Casa Blanca Association	BLD Services, LLC	Sarasota	FL	6154 Midnight Pass Road Sarasota, FL 34242	Lee Piver	941-349-5101	4			26	\$ 10,000.00	12/31/10	Dalmau
Clay County Utility, FL	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121	30			862	\$ 93,113.20	03/31/11	Dalmau
Plantation, FL	City of Plantation, FL	BLD Services, LLC	Plantation	FL	400 Northwest 73rd Avenue Plantation, FL 33317	Dan Pollio	954-797-2159			1	64	\$ 4,885.00	04/18/11	Dalmau
City of Pompano Beach, FL - North Pompano Beach Blvd	City of Pompano Beach, FL	Insituform Technologies, LLC	Pompano	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamy	954-786-4600	16			332	\$ 47,897.00	05/18/11	Dalmau
Goldenrod Road F.M., Orange County FL	Orange County, FL	T B Landmark, Inc.	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	11			413	\$ 44,138.00	06/30/11	Dalmau
Longboat Key, FL - CIPP Lateral Lining	Town of Longboat Key, FL	Insituform Technologies, LLC	Longboat Key	FL	600 General Harris Street Longboat Key, FL 34228	Annie Ross	941-316-1958	1	69		216.5	\$ 143,575.00	06/30/11	Johnson
Ft Lauderdale, FL	City of Ft Lauderdale, FL	Metro Equipment Services, Inc.	Fort Lauderdale	FL	100 N. Andrews Avenue Ft. Lauderdale, FL 33301	Jean Examond	954-492-2852	42	753		1590	\$ 1,368,067.00	07/31/11	Dalmau / Johnson
Tamarac, FL - Laterals	City of Tamarac, FL	SAK Construction, LLC	Tamarac	FL	10101 State Street Tamarac, FL 33321-6428	Scott London	954-597-3753	50	72		1106	\$ 226,920.00	09/17/11	Johnson
Orange County, FL - CIPP Lateral Lining	Orange County, FL	Reynolds Inliner, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	2			37	\$ 6,110.00	09/30/11	Johnson
Lakeland, FL - CIPP Lateral Lining	City of Lakeland, FL	SAK Construction, LLC	Lakeland	FL	228 S. Massachusetts Ave Lakeland, FL 33801	Rick	863-838-6074		7		11	\$ 13,790.00	09/30/11	Johnson
West Palm Beach, FL - Work Order No. 3	City of West Palm Beach, FL	Insituform Technologies, LLC	West Palm Beach	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	305-685-7898		6		116	\$ 16,695.00	11/30/11	Johnson
Town of Medley, FL	Town of Medley, FL	JCC Enterprises, Inc.	Medley	FL	10776 N.W. South River Drive Medley, FL 33178	Walter Wernke	305-889-1915		4		8	\$ 7,100.00	01/31/12	Johnson
Naples, FL - Emergency Liner Repair	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera	239-213-4721		4		12	\$ 6,700.00	01/31/12	Johnson
Pompano Beach-SS Pipe Rehab N Pompano Beach & NE 3rd St	City of Pompano Beach, FL	Insituform Technologies, LLC	Pompano	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamy	954-786-4600	10			194.5	\$ 29,590.00	04/30/12	Johnson
CVS Store # 2747 - Plantation , FL	CVS Store	Oak Construction Co., Inc.	Plantation	FL	4000 S.W. 30th Avenue Lauderdale, FL 33312	David Rolland	954-583-9625	1			15	\$ 3,000.00	04/30/12	Johnson
Naples, FL - CIPP Lateral Lining	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera	239-213-4721		109		327	\$ 186,825.00	05/31/12	Johnson
Tamarac, FL - Lateral Lining Task 2	City of Tamarac, FL	SAK Construction, LLC	Tamarac	FL	10101 State Street Tamarac, FL 33321-6428	Scott London	954-597-3753	77			1255	\$ 209,825.00	05/31/12	Johnson
City of Lakeland, FL - Lateral Lining	City of Lakeland, FL	Reynolds Inliner, LLC	Lakeland	FL	2531 Jewett Lane Sanford, FL 32771	Tommy Robertson	407-472-0014		6		6	\$ 12,000.00	05/31/12	Johnson
Orange County, FL Lateral Lining - Darden Ave & N Hudson St	Orange County, FL	Reynolds Inliner, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	8			215	\$ 22,028.00	05/31/12	Johnson
Orange County, FL - Lake Lawne Sanitary Sewer	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	123			3754	\$ 334,750.00	07/30/12	Figueroa/Johnson
Florida Dept of Transportation - Vernon, FL	Florida Dept of Transportation	Insituform Technologies, LLC	Vernon	FL	3061 Dublin Circle Bessemer, AL 35022	Tad Powell	205-425-2272	5		1	68	\$ 24,125.00	07/31/12	Nichols
Orange County, FL - Southwood	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	75			1555	\$ 198,750.00	09/30/12	Figueroa / Johnson
Lakeland, FL - Lateral Lining	City of Lakeland, FL	Reynolds Inliner, LLC	Lakeland	FL	2531 Jewett Lane Sanford, FL 32771	Tommy Robertson	407-472-0014		8		8	\$ 15,500.00	09/30/12	Figueroa
Pembroke Pines - PO # 20120827	City of Pembroke Pines, FL	BLD Services, LLC	Pembroke Pines	FL	10100 Pines Blvd Pembroke Pines, FL 33026	Dena Manning	954-435-6511		12		36	\$ 24,000.00	09/30/12	Figueroa



FLORIDA COMPLETED CIPP PROJECTS

Project Name	Owner	General Contractor	City	State	Owner		Long Laterals	Short Laterals	Spot Repairs	CIPP Lateral Footage	Final Contract Amount	Completion Date	BLD Superintendent
					Address	Contact Name Phone Number							
Longboat Key - Pipeline/MH/Lateral Rehab	Town of Longboat Key, FL	Insituform Technologies, LLC	Longboat Key	FL	600 General Harris Street Longboat Key, FL 34228	Annie Ross 941-316-1958	7	3		165	\$ 32,231.00	10/31/12	Figueroa
Naples, FL - CIPP Lateral Lining	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera 239-213-4721		69		207	\$ 127,315.00	12/31/12	Figueroa
Clay County Utility Authority, FL Task Order #23	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge 904-219-4121		1		3	\$ 5,255.00	12/31/12	Figueroa
Ft Lauderdale, FL - TV Inspection & Install CIPP (PO # PP132225)	City of Ft Lauderdale, FL	BLD Services, LLC	Fort Lauderdale	FL	100 N. Andrews Avenue Ft. Lauderdale, FL 33301	Jean Examond 954-492-2852	2			100	\$ 11,000.00	03/28/13	Figueroa
Homestead, FL - Infiltration & Inflow Reduction Project	City of Homestead, FL	Insituform Technologies, LLC	Homestead	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix 305-685-7898	33			594	\$ 98,925.00	05/29/13	Rivero / Torres
Tamarac, FL - Lateral Lining	City of Tamarac, FL	SAK Construction, LLC	Tamarac	FL	10101 State Street FL 33321-6428	Scott London 954-597-3753	206			4120	\$ 542,600.00	05/31/13	Figueroa / Torres
Orange County, FL - East Southwood Subdivision Gravity Sewer Rehab Project	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara 407-836-6802	61			1895	\$ 161,650.00	05/31/13	Figueroa
Tallahassee, FL-Talcom Group-W Tenn St Water/Sewer Const	City of Tallahassee, FL	Insituform Technologies, LLC	Tallahassee	FL	3016 N US Hwy 301, Suite 350 Tampa, FL 33619	Brandon Gerber 813-627-0007	10	3	32	410	\$ 107,150.00	07/31/13	Figueroa
Naples, FL - CIPP Lateral Lining	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera 239-213-4721		14		42	\$ 23,450.00	07/31/13	Figueroa
Gainesville Regional Utilities, FL	Gainesville Regional Utilities	Insituform Technologies, LLC	Gainesville	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel 904-292-3147	5	16		148	\$ 36,510.00	09/30/13	Torres
Orange County, FL - Lateral Lining	Orange County, FL	Layne Inliner, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara 407-836-6802	2			52	\$ 5,851.71	09/30/13	Torres
Tallahassee, FL - CIPP Lateral Lining	City of Tallahassee, FL	Insituform Technologies, LLC	Tallahassee	FL	3016 N US Hwy 301, Suite 350 Tampa, FL 33619	Brandon Gerber 813-627-0007		20		33.5	\$ 36,400.00	10/31/13	Torres
ECUA - PO #140225	Emerald Coast Utilities Authority	BLD Services, LLC	Pensacola	FL	Post Office Box 15311 Pensacola, FL 15311	Stacy Hayden 850-969-3350	4		1	114	\$ 13,300.00	01/31/14	Boihem
Clay County, FL - CIPP Lateral Lining	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston Street Green Cove Springs, FL 32043	Steve Rencarge 904-219-4121	8	14		188.5	\$ 46,850.00	02/17/14	Figueroa
Marianna, FL Sewer Rehabilitation	City of Marianna, FL	Insituform Technologies, LLC	Marianna	FL	3061 Dublin Circle Bessemer, AL 35022	Tad Powell 205-425-2272		210		315	\$ 361,200.00	02/21/14	Figueroa / Nicolitz / Torres
Naples, FL - CIPP Lateral Lining	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera 239-213-4721		67		201	\$ 112,225.00	02/28/14	Torres
West Palm Beach, FL - 2013 Sanitary Sewer - Phase I - Specific Locations	City of West Palm Beach, FL	Insituform Technologies, LLC	West Palm Beach	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix 305-685-7898		26		69	\$ 55,975.00	03/31/14	Figueroa / Torres
Pompano Beach CRA - Downtown Pompano Beach Connectivity Plan	City of Pompano Beach, FL	DP Development of the Treasure Coast, LLC	Pompano Beach	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamyea 954-786-4600	5			71.5	\$ 16,000.00	04/04/14	Figueroa
Clearwater, FL - CIPP Lateral Liner / PO # ST110477	City of Clearwater, FL	BLD Services, LLC	Clearwater	FL	Post Office Box 4748 Clearwater, FL 33756-5520	Rose Lara 727-562-4747	10			183	\$ 31,850.00	05/29/14	Torres
Pompano Beach, FL CRA - Downtown Pompano Beach Connectivity Plan	City of Pompano Beach, FL	DP Development of the Treasure Coast, LLC	Pompano Beach	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamyea 954-786-4600	1	2		37	\$ 11,400.00	06/30/14	Figueroa
Lake Wales, FL - CIPP Lateral Lining	City of Lake Wales, FL	LMR Construction, LLC	Lake Wales	FL	201 W. Central Avenue Lake Wales, FL 33853	Ted Long 863- 678-4182, ext. 285	30	2		820	\$ 90,200.00	07/31/14	Torres
Oakland Park, FL - Task 1	City of Oakland Park, FL	Insituform Technologies, LLC	Oakland Park	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix 305-685-7898	37	1		572	\$ 106,220.16	08/31/14	Figueroa / Torres
Pinellas County, FL - Annual	Pinellas County, FL	Lanzo Companies	Clearwater	FL	125 SE 5th Court Deerfield Beach, FL 33441	James Tilli 954-979-0802	3			35	\$ 9,525.00	08/31/14	Torres
Largo, FL - WO # 62051.1	City of Largo, FL	BLD Services, LLC	Largo	FL	201 Highland Avenue, Build. 1 Largo, FL 33779	Tim Calvit 954-249-5017	11			287	\$ 33,930.00	09/23/14	Torres
City of Tallahassee, FL - Release 5, 6 & 7	City of Tallahassee, FL	Insituform Technologies, LLC	Tallahassee	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel 904-292-3147		26		390	\$ 73,700.00	10/29/14	Torres
City of Naples, FL - CIPP Lateral Lining	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera 239-213-4721		91		273	\$ 154,925.00	11/13/14	Figueroa / Torres
Gainesville, FL - Sectional Liners	City of Gainesville, FL	W. G. Johnson and Sons, Inc.	Gainesville	FL	301 SE 4th Ave, Gainesville, FL 32601	Dana Gauthier 352-393-1250			3	9	\$ 6,600.00	01/31/15	Torres
Gainesville, FL Regional Utilities - PO # 4510024433	City of Gainesville, FL	BLD Services, LLC	Gainesville	FL	301 SE 4th Ave, Gainesville, FL 32601	Dana Gauthier 352-393-1250	41			670	\$ 124,476.00	02/10/15	Torres
Manatee County, FL - Sewer Lateral Lines on Anna Maria Island	Manatee County, FL	BLD Services, LLC	Anna Maria Island	FL	1112 Manatee Ave W, Suite 803 Bradenton, FL 34205	Chris Daley 941-749-0314	73	9		1558	\$ 272,200.00	02/20/15	Figueroa / Torres
City of Plantation, FL	City of Plantation, FL	Insituform Technologies, LLC	Plantation	FL	400 Northwest 73rd Avenue Plantation, FL 33317	Dan Pollio 954-797-2159		9		45	\$ 27,825.00	03/19/15	Figueroa
City of Venice, FL - Lateral Lining	City of Venice, FL	Insituform Technologies, LLC	Venice	FL	3016 N US Hwy 301, Suite 350 Tampa, FL 33619	Brandon Gerber 813-627-0007	10			24.5	\$ 18,800.00	03/31/15	Figueroa
Dunnellon, FL - Lateral Liner Installation	City of Dunnellon, FL	Daly & Zilch	Dunnellon	FL	305 S. Salisbury Ter., Suite A Lecanto, FL 34461	Bud Daly 352-341-4860	9	1		150	\$ 28,900.00	04/30/15	Figueroa
Clay County Authority, FL - Task Order # 27	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge 904-219-4121	21	40		847	\$ 157,059.00	05/31/15	Torres
Miami Dade County-Countywide Cont. for Rehab of San Sewers by CIPP	Miami Dade County, FL	Insituform Technologies, LLC	Miami	FL	3071 SW 38 Ave, Suite 107-14, Miami, FL 33146	Dalia Abrahante 786-552-8233	19	2		366	\$ 64,723.50	07/30/15	Torres
Plant City, FL / 2014-07-09 Contract - Sanitary Sewer Lining Project	City of Plant City, FL	BLD Services, LLC	Plant City	FL	302 West Reynolds Street, 3rd Floor, Plant City, FL 33563	Tonya Grant 813-757-9288		248		557	\$ 1,487,740.63	08/21/15	Figueroa, J / Torres
Tamarac, FL - Lateral Lining Task 2	City of Tamarac, FL	SAK Construction, LLC	Tamarac	FL	10101 State Street FL 33321-6428	Scott London 954-597-3753	353	16		6860.5	\$ 932,780.00	08/24/15	Figueroa, J / Johnson / Molina / Torres
ECUA-Penn Haven & Cantonment Lateral Rehab	Escambia County Utility Authority	BLD Services, LLC	Pensacola	FL	PO Box 15311 Pensacola, FL 32514-0311	Stacy Hayden 850-969-6648	1093	48	20	27819	\$ 5,366,555.00	09/30/15	Bel / Boihem / Budde / Hampton / Nicolitz / Trapani
South Walton Utility Company, Inc. - 2014 Sanitary Sewer Rehabilitation Phase I	South Walton Utility Company, Inc.	J & P Construction Co., Inc.	Tuscaloosa	FL	P. O. Drawer 3147 Tuscaloosa, AL 35403	Tommy Jamison 205-345-6165		34	15	250.5	\$ 197,042.50	09/30/15	Trapani, JT
ToHo Water Auth-Gravity Sewer Rehab Replacement Phase I & II/ Orlando, FL	ToHo Water Authority	Prime Construction Group, Inc.	Orlando	FL	1000 Jetstream Drive Orlando, FL 32824	Roy Smith 407-856-8180	26			532.5	\$ 114,150.00	10/15/15	Figueroa, J
Oakland Park, FL - 2015 Release #1	City of Oakland Park, FL	Insituform Technologies, LLC	Oakland Park	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix 813-299-6319	36			785.5	\$ 99,565.92	10/31/15	Figueroa, H / Molina
Clearwater, FL - CIPP Lateral Liner / PO # ST110477	City of Clearwater, FL	BLD Services, LLC	Clearwater	FL	Post Office Box 4748 Clearwater, FL 33756-5520	Rose Lara 727-562-4747	13			289	\$ 9,225.00	10/31/15	Figueroa, J / Torres
Naples, FL - 14/15 TopHat/Full Wrap Installation	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera 239-213-4721	10	42		426	\$ 94,660.00	11/30/15	Molina
Alys Beach, FL - Block I Sewer Rehabilitation and Repair	EBSCO Gulf Coast Development, Inc.	BLD Services, LLC	Alys Beach	FL	Post Office Box 61-5500 Alys Beach, FL 32461	Luke McGlone 850-596-8024		5		5	\$ 16,750.00	11/30/15	Boihem



FLORIDA COMPLETED CIPP PROJECTS

Project Name	Owner	General Contractor	City	State	Address	Owner Contact Name	Phone Number	Long Laterals	Short Laterals	Spot Repairs	CIPP Lateral Footage	Final Contract Amount	Completion Date	BLD Superintendent
Cocoa Beach, FL - FY2014 Sanitary Sewer Rehab Program	City of Cocoa Beach, FL	Insituform Technologies, LLC	Cocoa Beach	FL	2 South Orlando Avenue Cocoa Beach, FL 32932	Darby Blanchard	321-863-9390	21	55		795	\$ 173,400.00	01/31/16	Figueroa, H
Orange County, FL - Lateral Repairs	Orange County, FL	Vac Vision Environmental, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802		2		4	\$ 5,600.00	01/31/16	Figueroa, H
West Palm Beach, FL - Essex Lane Lateral Rehab	City of West Palm Beach, FL	Hinterland Group, Inc.	West Palm Beach	FL	5401 Haverhill Rd North, Suite 114 West Palm Beach, FL 33407	Brett Knochak	954-648-7758	2	5		21	\$ 17,000.00	02/29/16	Figueroa, J
Casselberry & Winter Park, FL - Sectional & Lateral Repairs	City of Casselberry, FL & City of Winter Park, FL	Layne Inliner, LLC	Casselberry & Winter Park	FL	2531 Jewett Lane Sanford, FL 32771	Tommy Robertson	407-472-0014		2	4	21	\$ 26,700.00	03/30/16	Figueroa, J
Orange County, FL - Lateral Repairs	Orange County, FL	Vac Vision Environmental, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802		4		8	\$ 10,000.00	03/30/16	Figueroa, J
Leesburg, FL / ITB # 150461	City of Leesburg, FL	Vac Vision Environmental, LLC	Leesburg	FL	201 E. North Street, Suite 214 Greenville, SC 29601	Mikah Williams	864-236-7478	5	2		60.5	\$ 26,200.00	03/30/16	Figueroa, J
Manatee County, FL-Anna Maria Island System #15 Lateral Lining & Ancillary Svcs	Manatee County, FL	J.T.V., Incorporated	Anna Maria Island	FL	1112 Manatee Ave W, Suite 803 Bradenton, FL 34205	Chris Daley	941-749-0314	59	3		625	\$ 120,679.10	04/25/16	Figueroa, J
Orange County, FL - Pospiech Contracting / Chickasaw	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802		5		5	\$ 11,000.00	04/28/16	Figueroa, J
Okaloosa County Board CC, FL - 2011	Okaloosa County Board	Insituform Technologies, LLC	Shalimar	FL	18378 Tom Drive Hammond, LA 70403	Calvin Foreman	985-345-4474			21	130	\$ 53,765.46	05/10/16	S&P
South Walton Utility Company - Miramar Beach, FL / CIPP Point Repairs	South Walton Utility Company, Inc.	BLD Services, LLC	Tuscaloosa	FL	369 Miramar Beach Drive Miramar Beach, FL 32550	Alicia Keeter	850-837-2988			4	21	\$ 17,000.00	05/10/16	S&P
Miami Dade County, FL - P0145 1 Year County Wide Rehab CIPP	Miami Dade County, FL	Insituform Technologies, LLC	Miami	FL	3071 SW 38 Ave, Suite 107-14, Miami, FL 33146	Dalia Abrahante	786-552-8233	73	10		1420.5	\$ 277,015.00	05/17/16	Figueroa, H / Figueroa, J / Molina
Lantana-Delray, FL / Lateral Rehab	Town of Lantana, FL & City of Delray Beach, FL	Hinterland Group, Inc.	Lantana & Delray Beach	FL	5401 Haverhill Rd North, Suite 114 West Palm Beach, FL 33407	Brett Knochak	954-648-7758	3			44	\$ 10,300.00	05/31/16	Figueroa, H
Orange County, FL - Metro Equipment Service / Shenandoah Park	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802	61			1746	\$ 191,450.00	06/08/16	Figueroa, J
Miami-Dade County, FL - AECOM Issuance P0168-4 Lateral Lining	Miami Dade County, FL	Insituform Technologies, LLC	Miami	FL	3071 SW 38 Ave, Suite 107-14, Miami, FL 33146	Dalia Abrahante	786-552-8233	21	1		408	\$ 69,645.00	07/31/16	Figueroa, H / Figueroa, J
Clay County, FL - Task Order # 28	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121		4		190	\$ 13,897.00	08/30/16	Trapani, JT
North Bay Village, FL - Sanitary Sewer Rehabilitation Program	City of North Bay Village, FL	Insituform Technologies, LLC	North Bay Village	FL	9001 NW 97th Terrace, Suite F Medley, FL 33178	Frank Kendrix	813-299-6319	1			59	\$ 7,500.00	08/30/16	McIntosh
Miami Dade County, FL - S-866 2 Year County Wide Rehab CIPP	Miami Dade County, FL	Insituform Technologies, LLC	Miami	FL	3071 SW 38 Ave, Suite 107-14, Miami, FL 33146	Dalia Abrahante	786-552-8233	60	6		788.5	\$ 207,608.00	08/31/16	Figueroa, H / Figueroa, J
Tamarac, FL / Lateral Lining Task 1 - 2016	City of Tamarac, FL	SAK Construction, LLC	Tamarac	FL	10101 State Street Tamarac, FL 33321-6428	Scott London	954-597-3753	593	6		11229	\$ 1,523,280.00	08/31/16	Figueroa, H / Figueroa, J / Molina/Shumake/Trueba
Orange County, FL - CIPP Lateral Lining	Orange County, FL	Miller Pipeline, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802		5		5	\$ 13,500.00	08/31/16	Figueroa, J
Clay County, FL - Lateral Repair	Clay County Utility Authority	Burnham Construction, Inc.	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121		1		2	\$ 5,750.00	08/31/16	Figueroa, J
Orange County, FL - Chickasaw Lateral Repairs	Orange County, FL	Insituform Technologies, LLC	Orange County	FL	8100 Presidents Drive Suite A Orange County, FL 32809	David McNamara	407-836-6802		1		1.5	\$ 3,000.00	08/31/16	Figueroa, J
Ft Walton Beach/Okaloosa, FL Sanitary Sewer Rehab Project	City of Fort Walton Beach, FL	Insituform Technologies, LLC	Ft Walton Beach	FL	3061 Dublin Circle Bessemer, AL 35022	Todd Hester	205-425-2272	1	3		16	\$ 17,385.00	09/29/16	Boihem
Pasco County, FL - Sewer Lateral Lining Services	Pasco County, FL	Vac-Vision Environmental	Pasco County	FL	107 S. Warwick Road Greenville, SC 29617	Wesley Kingery	813-626-0700	2			39.5	\$ 10,900.00	09/30/16	Figueroa, J
Niceville, FL - Sewer Rehab 2016	City of Niceville, FL	Insituform Technologies, LLC	Niceville	FL	18378 Tom Drive Hammond, LA 70403	Calvin Foreman	985-345-4474		1		14	\$ 25,885.00	09/30/16	Boihem
Tallahassee, FL - Van Buren St / 21" Sanitary Lateral Rehab	City of Tallahassee, FL	Vac Vision Environmental, LLC	Tallahassee	FL	107 S. Warwick Road Greenville, SC 29617	Wesley Kingery	813-626-0700		1		1	\$ 11,400.00	09/30/16	Figueroa, J
Miami Beach, FL / Ric-Man International, Inc St Petersburg, FL - CIPP Lateral Lining Piggyback	City of Miami Beach, FL	Insituform Technologies, LLC	Miami Beach	FL	1700 Convention Center Drive, Miami Beach, FL 33139	Frank Kendrix	305-887-5007	111	5		1926.5	\$ 344,800.00	10/31/16	Figueroa, H / Trueba
Orlando, FL - Sanitary Sewer Lining IFB16-0007	City of St Petersburg, FL	BLD Services, LLC	St Petersburg	FL	One 4th Street North, 5th Floor St. Petersburg, FL 33701	Matt Wilson	727-415-0192	124	206		3478	\$ 1,026,260.00	11/30/16	Figueroa, H / Figueroa, J / Trapani
Lake Worth, FL - Tropical Dr & Barton Rd Infrastructure Improvements	City of Lake Worth, FL	Miller Pipeline, LLC	Orlando	FL	Post Office Box 34141 Indianapolis, IN 46234	Butch Lanaville	863-937-1219	37			793	\$ 49,373.00	02/07/17	Walls, D / Vazquez
North Miami, FL - Sanitary Sewer Lining & Rehabilitation	City of Lake Worth, FL	B&B Underground Construction, Inc.	Lake Worth	FL	4050 Westgate Avenue, Suite 110 West Palm Beach, FL 33409	John Adkins	561-249-0341	104	6	1	2775.5	\$ 386,500.00	02/28/17	Trueba
Polk County, FL - Heritage Place Wastewater / Bartlow	City of North Miami, FL	Insituform Technologies, LLC	North Miami	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	305-685-7898	10	9		162	\$ 53,550.00	02/28/17	Figueroa, H / Figueroa, J
Oakland Park, FL - CIPP Lateral Lining	Polk County	Miller Pipeline, LLC	Polk County	FL	Post Office Box 34141 Indianapolis, IN 46234	Jeff Newman	863-937-1219	4	2		6	\$ 27,180.00	03/31/17	Vazquez
Sarasota, FL - Lateral Liner at 635 Orange Ave Tallahassee, FL - Glendale Area Sanitary Sewer	City of Oakland Park, FL	Insituform Technologies, LLC	Oakland Park	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	305-685-7898	58	1		1102	\$ 167,139.44	04/27/17	Figueroa, H
Manatee County, FL - P1601289	City of Sarasota, FL	Spectrum Underground, Inc.	Sarasota	FL	1876 B Barber Road, Suite 200 Sarasota, FL 34240	Bill Chapman	941-342-6708	1			25	\$ 5,210.00	06/21/17	Trueba
Plant City, FL - Sanitary Sewer Lining Project 2016	City of Tallahassee, FL	Insituform Technologies, LLC	Tallahassee	FL	1112 Manatee Ave W, Suite 803 Bradenton, FL 34205	Michael Fiechtl	404-213-9047		12		23	\$ 37,460.36	06/30/17	Figueroa, H
Naples, FL - CIPP Lateral Lining	Manatee County, FL	BLD Services, LLC	Bradenton	FL	302 West Reynolds Street, 3rd Floor, Plant City, FL 33563	Ed Ference	941-749-0314	35	2		581	\$ 461,500.00	07/25/17	Trueba
Clay County, FL - Task Order # 22 / Meadowbrook Lateral Insp & Lining	City of Plant City, FL	BLD Services, LLC	Plant City	FL	380 Riverside Circle Naples, FL 34102	Tonya Grant	813-757-9288	177	72		1375.5	\$ 1,943,711.00	08/18/17	Figueroa, H / Figueroa, J / Ladner / Vazquez / Walls, D
Largo, FL - Trenchless Sanitary & Storm Rehabilitation	City of Naples, FL	Insituform Technologies	Naples	FL	477 Houston St., Green Cove Springs, FL 32043	Adam Rivera	239-213-4721	3	106		396.5	\$ 186,355.00	08/18/17	Figueroa, H / Figueroa, J / Trueba
Titusville, FL - CIPP Sectional Repairs	Clay County Utility Authority	Insituform Technologies, LLC	Clay County	FL	201 Highland Avenue, Build. 1 Largo, FL 33779	Steve Rencarge	904-219-4121	8	81		351	\$ 198,000.00	08/24/17	Figueroa, J / Trueba
Apopka, FL - Emergency Lateral Lining/Sheeler	City of Largo, FL	BLD Services, LLC	Largo	FL	2531 Jewett Lane Sanford, FL 32771	Tim Calvit	954-249-5017	8			169	\$ 33,850.00	09/30/17	Butler, K
Gainesville, FL - Weschester Phase 4B	City of Trusville, FL	Layne Inliner, LLC	Titusville	FL	120 East Main Street Apopka, FL 32703	Tommy Robertson	407-472-0014			6		\$ 33,400.00	10/25/17	S & P
Castleberry, FL - Lateral Liners	City of Apopka, FL	BLD Services, LLC	Apopka	FL	301 SE 4th Ave, Gainesville, FL 32601	Jorge Garcia	407-703-1700	1			20	\$ 4,500.00	11/27/17	Morales
	Gainesville Regional Utilities	W G Johnson and Son, Inc.	Gainesville	FL	2531 Jewett Lane Sanford, FL 32771	Peter Simms, P.E.	352.393.1643		1		2	\$ 5,000.00	01/31/18	Morales
	City of Castleberry, FL	Layne Inliner, LLC	Castleberry	FL		Tommy Robertson	407-472-0014	2			24	\$ 13,100.00	01/31/18	Morales



FLORIDA COMPLETED CIPP PROJECTS

Project Name	Owner	General Contractor	City	State	Owner			Long Laterals	Short Laterals	Spot Repairs	CIPP Lateral Footage	Final Contract Amount	Completion Date	BLD Superintendent
					Address	Contact Name	Phone Number							
Naples, FL - FY 17-18 TopHat/Full Wrap Installation	City of Naples, FL	Insituform Technologies, LLC	Naples	FL	380 Riverside Circle Naples, FL 34102	Adam Rivera	239-213-4721	105			2885	\$ 297,675.00	03/31/18	Figueroa, J
Oxford Estates East, FL - Lateral Repair	Oxford Estates East	Burnham Construction, Inc.	Jacksonville	FL	11413 Enterprise East Blvd Macclenny, FL 32063	David Ashley	904-259-5360		1		5	\$ 8,500.00	04/30/18	Morales
Brevard County, FL - CIPP Lateral Lining	Brevard County, FL	Insituform Technologies, LLC	Viera	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel	904-886-3737	1			21	\$ 18,000.00	05/31/18	Morales
Pinellas Park, FL - CIPP Sectional Repair	Pinellas Park	BLD Services, LLC	Pinellas Park	FL	6051 78th Avenue Pinellas Park, FL 33781	Dana Say	727-240-5152			1		\$ 4,500.00	05/31/18	Morales
Martin County Utilities, FL - Stuart, SE Fischer Street	Martin County Utilities	Layne Inliner, LLC	Stuart	FL	2531 Jewett Lane Sanford, FL 32771	John Rinehart	407-472-0014	1			18	\$ 5,000.00	06/30/18	Trueba
Lake Worth, FL - Neighborhood Road Program Year 1 / District 2	City of Lake Worth, FL	Southern Underground Industries, Inc.	Lake Worth	FL	5979 NW 151 Street, Suite 102-1 Miami Lakes, FL 33014	Juan Barreneche	954-650-4699	21	4		324	\$ 77,350.00	07/26/18	Trueba
Clay County Utilities Authority - Task Order # 30	Clay County Utility Authority	Insituform Technologies, LLC	Middleburg	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121	1	34		110	\$ 79,675.00	07/31/18	Fraley
Hernando County, FL - Lateral Liners	Hernando County, FL	VacVision Environmental, LLC	Hernando County	FL	29 Rushmore Drive Greenville, SC 29615	Mikah Williams	864-236-7478	21			409	\$ 73,900.00	08/29/18	Moran
Clay County Utilities Authority, FL - PVC Lateral Repair	Clay County Utility Authority	Vallencourt Construction Company, Inc.	Clay County	FL	449 Center Street Green Cove Springs, FL 32043	Jason Gambrell	904-291-9330		2		2	\$ 8,000.00	08/30/18	Fraley
Gainesville, FL - NE 9th Street CIPP Lateral Lining	Gainesville Regional Utilities	BLD Services, LLC	Gainesville	FL	301 SE 4th Ave, Gainesville, FL 32601	Peter Simms, P.E.	352.393.1643	57	1	11	1402	\$ 521,760.13	08/31/18	Morales
Manhole and Lift Station Wet Well Rehabilitation Services	Town of Longboat Key, FL	BLD Services, LLC	Longboat Key	FL	600 General Harris Street Longboat Key, FL 34228	Annie Ross	941-316-1958	1			25	\$ 33,509.50	09/12/18	Figueroa, H / Torres
Pompano Beach, FL - CIPP Rehab Annual Contract / Bid L-24-16	City of Pompano Beach, FL	Insituform Technologies, LLC	Pompano Beach	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamyea	954-786-4600	31			699	\$ 91,985.00	09/25/18	McSwain
Sarasota County, FL - WA #32 Shadowlawn SS	Sarasota County, FL	Insituform Technologies, LLC	Sarasota County	FL	3016 US HWY 301 NORTH STE 900 Tampa FL 33619	Brandon Gerber	813-627-0007		1		1	\$ 1,800.00	09/26/18	Figueroa, J
St Petersburg, FL - Repair 3 PVC Laterals	City of St Petersburg, FL	Granite Inliner, LLC	St Petersburg	FL	One 4th Street North, 5th Floor St. Petersburg, FL 33701	Matt Wilson	727-415-0192		3		3	\$ 11,500.00	09/26/18	Figueroa, J
FDOT - T5506 John Young Pkwy	Florida Dept of Transportation	Insituform Technologies, LLC	Delnad	FL	3016 US Highway 301, Suite 350 Tampa, FL 33610	Brandon Gerber	813-627-0007	5	1		167	\$ 32,412.50	10/15/18	Fraley / Morales
Loxahatchee, FL - Full Wrap Service Connection Seal + Lateral Liner	Loxahatchee River Environmental Control District	BLD Services, LLC	Loxahatchee	FL	2500 Jupiter Park Drive Jupiter, FL 33458	Kris Dean	561-747-5700	19	19		560	\$ 134,751.73	10/31/18	Fraley
Clay County, FL - PVC Lateral Repair	Clay County Utility Authority	Jr. Davis Construction Company	Clay County	FL	477 Houston St., Green Cove Springs, FL 32043	Steve Rencarge	904-219-4121		33		33	\$ 88,500.00	10/31/18	Fraley
FIU - Biscayne Campus / Sewer System Repairs 2018 Cycle Phase III (Granite)	Florida International University	Granite Inliner, LLC	Miami	FL	14413 62nd Street North Clearwater, FL 33760	John Rinehart	727-530-7577	3			117	\$ 15,370.00	01/15/19	Figueroa, J
West Palm Beach, FL / 18-0004-00 L544 Laterals	City of West Palm Beach, FL	Hinterland Group, Inc.	West Palm Beach	FL	2501 W. Blue Heron Blvd Rivera Beach, FL 33404	Curt Marling	561-640-3503		2		6	\$ 7,395.00	01/15/19	Figueroa, J
Boynton Beach, FL - Phase 5.2 Clean & CCTV Inspection of Lateral	City of Boynton Beach, FL	Insituform Technologies	Boynton	FL	9001 NW 97th Terrace Medley, FL 33178	Frank Kendrix	813-299-6319	35			627	\$ 119,364.00	01/31/19	Calderon / Figueroa, H
Pasco County, FL - Lateral Lining 8115 Saybrook Dr, Port Richey	Pasco County, FL	Vacvision Environmental, LLC	Pasco County	FL	10200 US Hwy 92 E Tampa, FL 33610	Ben Roesse	866-954-9888	2			45	\$ 25,250.00	01/31/19	Calderon
Oakland Park, FL - CIPP Lining & Lateral Lining	City of Oakland Park, FL	EnviroWaste Services Group	Oakland Park	FL	4450 SW 59th Avenue Davie, FL 33314	Mike Gaeta	813-326-8712	46			737	\$ 145,547.50	02/28/19	Figueroa, H
Largo, FL - Tophat at 3872 Harbor Hills Dr	City of Largo, FL	Granite Inliner, LLC	Largo	FL	201 Highland Avenue, Build. 1 Largo, FL 33779	Tim Calvit	954-249-5017	1			2	\$ 6,000.00	02/28/19	Calderon
Delray Beach, FL - Reclaimed WM / PO # 53020	City of Delray Beach, FL	Lanzo Construction Co., FL	Delray Beach	FL	125 S. W. 5th Court Deerfield Beach, FL 33441	Mark Garrett	954-719-5953	11			59	\$ 7,750.00	03/15/19	Figueroa, J
Coral Gables - Giralda Plaza Drainage Improvements T Liner	City of Coral Gables	BLD Services, LLC	Coral Gables	FL	405 Biltmore Way Gables, FL 33134	Coral Jose Saucedo	305-460-5102	1			25	\$ 7,000.00	03/27/19	Figueroa, H
Manatee County - 2018 Lateral Release	Manatee County, FL	BLD Services, LLC	Bradenton	FL	1112 Manatee Ave W, Suite 803 Bradenton, FL 34205	Ed Ference	941-749-0314	52	21	2	1061	\$ 287,425.00	03/31/19	Morales
West Palm Beach, FL - Lateral Rehab (CIPP) Henrietta Ave	City of West Palm Beach, FL	Hinterland Group, Inc.	West Palm Beach	FL	2501 W. Blue Heron Blvd Rivera Beach, FL 33404	Curt Marling	561-640-3503	33	1		1048	\$ 113,537.50	03/31/19	Morales
Port Orange, FL - Lift Station Areas # 5, 7, 102 Lateral Lining as Identified	City of Port Orange, FL	Insituform Technologies, LLC	Port Orange	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel	904-292-3147	54	64		1003	\$ 203,475.00	03/31/19	Calderon / Morales
Pompano Beach, FL - DPD 17-074 Old Pompano Streetscapes	City of Pompano Beach, FL	DP Development of the Treasure Coast, LLC	Pompano Beach	FL	100 W. Atlantic Blvd., Pompano Beach, FL 33060	Steve Lamyea	954-786-4600	18			330	\$ 62,445.00	04/16/19	Morales
St Petersburg, FL - Phase I Citywide SS CIPP Lining FY17	City of St Petersburg, FL	Insituform Technologies, LLC	St Petersburg	FL	One 4th Street North, 5th Floor St. Petersburg, FL 33701	Matt Wilson	727-415-0192	335			6220	\$ 1,160,847.00	04/24/19	Butler, K / Figueroa, H / Morales / Moran / Trueba / Vazquez
St Petersburg, FL - CIPP Lateral Lining Piggyback 2017	City of St Petersburg, FL	BLD Services, LLC	St Petersburg	FL	One 4th Street North, 5th Floor St. Petersburg, FL 33701	Matt Wilson	727-415-0192	360	112		9409	\$ 1,236,934.28	04/24/19	Moran / Morales
Tamarac, FL / 17-118 - I I Work for Laterals	City of Tamarac, FL	BLD Services, LLC	Tamarac	FL	10101 State Street FL 33321-6428	Tamarac, Jerry Robinson	954-597-3753	2422	156	7	40046	\$ 7,698,162.42	04/30/19	Calderon / Figueroa, H / Figueroa, J / Fraley / McSwain / Morales / Trueba
Brevard County, FL - Pipeline Rehab. FY 2019, CCTV and Lateral Lining	Brevard County, FL	Insituform Technologies, LLC	Viera	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel	904-292-3147	1			79	\$ 13,500.00	04/30/19	Morales
Margate - CIPP Lateral Rehabilitation (Largo Piggyback)	City of Margate, FL	BLD Services, LLC	Margate	FL	901 NW 66th Avenue Margate, FL 33063	Michael Bush	954-979-6213	5			148	\$ 19,158.25	05/20/19	Figueroa, H
Pahokee Housing Authority - Fremd Village & Padgett Island Sewer Lining	Pahokee Housing Authority	American Infrastructure Technologies	Pahokee	FL	8799 Highway 31 Hanceville, AL 35077	Tim Bixler	256-739-4747	41			2222	\$ 150,520.00	06/30/19	Trueba
Hernando County, FL - Lateral Liners	Hernando County, FL	Vacvision Environmental, LLC	Brooksville	FL	10200 US Hwy 92 E Tampa, FL 33610	Patrick LeClair	832-374-1800	4			74	\$ 17,500.00	07/18/19	Calderon / Morales
Orange Park, FL - CY 19 CIPP Lining, Lateral Lining Repair	Town of Orange Park, FL	Insituform Technologies, LLC	Orange Park	FL	6966 Business Park Blvd. Jacksonville, FL 32256	Brandt Curvel	904-292-3147		1		4	\$ 6,500.00	07/31/19	Figueroa, J
								23785	55674	3559	651687.21	\$ 206,239,560.62		

BLD – LATERAL LINING PROJECT REFERENCES



City of St. Petersburg, FL – 913-81
Sanitary Sewer Lateral Lining FY2015
Started June 2016, \$450,000.00 = 150
Laterals up to 25 LF
Renewed June 2017, \$900,000.00 =
300+ Laterals up to 25 LF
Contact: Matthew Wilson (727) 415-
0192
Email: Matthew.Wilson@stpete.org

City of Tamarac, FL – 17-11B – I & I
Work for Laterals (2-year project)
Started April 2017 (BLD was low
bidder) \$7,743,035.00
2,752 laterals up to 25 LF
Contact: Jerry Robinson (954) 597-
3753
Email: jerry.robinson@tamarac.org

**City of Naples, FL FY-18 Top Hat/Full
Wrap Installation** (sub to Insituform)
Started September 2017
175 Laterals from 5 LF up to 30 LF
Contact: Adam Rivera (239) 213-4721
Email: arivera@naplesgov.com

**Emerald Coast Utilities Authority
(ECUA) – Pensacola, FL – Sanitary
Sewer Lateral Lining & Excavated
Repair Annual Contract**
Started June 2014 renewed in 2018
2,200+ laterals up to 25 LF
Contact: Stacy Hayden, P.E. (850) 969-
6648
Email: stacy.hayden@ecua.fl.gov

**City of Largo, FL, Engineering
Project Number 2016-1, Bid # 16-B-
534**
Started June 2016 renewed to present
300+Laterals up to 25 LF
Contact: Brian Highnote (727) 512-
3461
Email: bhighnot@largo.com



Proline Vactor Services ,Inc.

St Augustine Annual Sewer Rehab Bid 2020

Re: Prior Experience / Qualifications for Sewer Cleaning, Televising, Root/Grease Cutting, Tuberculation Cutting/Removal, Protruding Tap/Lateral Removal, Chemical Grouting

Years in Business: 08/01/1998- Present

To Whom it may Concern,

The following list provided below is a list of work completed by Proline Vactor Services for Insituform Technologies Exclusively in the Following Fields, PACP Sanitary/Storm Televising 8"-96"+, Sanitary/Storm Cleaning 8"-96"+, The following types of Cutting ,Root,Grease,Tuberculation and Protruding Tap Cutting and or Removal, Chemical Grouting of Laterals. Note this is only a outline of work performed ,we have been performing this type of work since January of 1999. We have on average 4 TV Trucks, 4 TV Grout Trucks, 4 Jettter Trucks and 6 Vac trucks in our Fleet.

This is a combined list of Experience with the Operators and Superintendants provided in Proline's Resume. All of Proline's TV Operators are PACP Certified and have been with the company at a Minimum of 7+Years, All Proline Employees are Confined Space Trained and Certified.

See Attached List:

Sincerely,

Owner/President

3/5/2020

Insituform Project #	Project Name	Linear Ft	Root/Grease Cut LF	Tuberc. Cut LF	Taps Cut	Taps/Joints Grouted
14187203	Miami Dade	450,000	15,000	3,000	30	5,000
14168402	Pompano Beach	75,000	10,000	2,500	25	1,500
14173005	North Miami	60,000	5,000	250	10	750
14168501	Hialeah	60,000	3,750	350	15	1,500
141787	Margate	75,000	10,000	500	20	2,000
141820	Plantation	45,000	3,000	250	15	750
1419146	Ft Lauderdale	225,000	20,000	1,500	35	5,000
141759	Oakland Park	300,000	15,000	2,500	20	0
14135812	Naples	100,000	12,000	2,500	25	2,500
141856	Cape Coral	300,000	10,000	5,000	50	5,000
14182809	Sarasota County	450,000	35,000	3,500	50	5,500
14182803	City of Sarasota	200,000	12,500	2,500	20	2,500
142030	St Petersburg	200,000	7,500	2,500	25	3,000
141928	Hillsborough County	200,000	8,500	3,450	28	1,750
142087	TOHO Water Authority	100,000	5,000	4,000	35	0
14152842	Gainesville GRU	285,000	10,000	4,500	30	3,000
142036	Orange Park	50,000	2,500	1,000	10	0
14162122	Melbourne	325,000	7,500	5,000	45	2,500
142015	West Melbourne	50,000	5,000	1,000	10	500
141931	Brevard County	500,000	30,000	5,000	55	5,000
141227619	Cocoa Beach	100,000	8,500	7,500	30	2,500
141809	City of Cocoa	125,000	4,500	1,500	10	0
141687	Deerfield	150,000	7,500	1250	25	2,500
14193601	Miramar	300,000	8,500	1,500	20	5,000
141753	Palm Beach County	100,000	7,500	2000	15	750
141450	Boynton Beach	250,000	12,500	2500	35	0
14148102	West Palm Beach	75,000	4,500	1000	10	400
14128902	Collier County	150,000	10,000	1,500	15	500
14183801	Hallandale Beach	300,000	20,000	2,500	25	2,500
1414980	Tamarac	50,000	3,500	1,500	10	350
1417183	Hollywood	250,000	15,000	2,500	25	2,500
141753	Town of Palm Beach	50,000	3500	1,500	15	500
141745	Dania	25,000	2,500	750	5	75
141772	Crystal River	35,000	3,500	1,500	6	200
141766	Homestead	35,000	2,500	750	0	100
141851	St Augustine	25,000	1,500	500	2	0
141943	Wellington	25,000	2,500	750	5	400
14180002	Daytona Beach	45,000	4,500	1,500	5	0
14199801	North Bay Village	7500	1,500	500	5	75
14196403	Miami Springs	10,000	1,000	500	0	0
142018	Dunedin	5000	750	350	0	0
142023	City of Atlantis	4500	750	200	2	0
142042	Flagler Beach	8,000	750	350	0	0
142060	Patrick AFB	10,000	4000	650	5	0
142094	Fernandina Beach	5000	500	200	3	45
14210301	St Johns County	3000	200	0	0	0
14209801	Lauderhill	7500	750	400	5	75
14212201	Palm Bay	6500	500	0	0	45
14213702	Port Orange	7500	750	0	0	0
		6,204,500	361200	86,450	831	66,265

2020 PROLINE VACTOR SERVICES VEHICLE LIST			
DESCRIPTION	VIN #	VIN #	TAG #
JETTER TRUCK/TRAILERS			
2001 JETTER Truck	2FZAASAK41AG13909		N5125T
2005 Peterbilt Jetter Truck	2NPLHD8X86M633669		ID03MJ
2012 Seca Jetter	1S9KU2124CC381497		723PLK
2018 Vactor Jetter Traller	1U9FS1626JA044029		Y08QZG
ARIES TV TRUCKS			
2013 ISUZU TV TRUCK	54DC4J1B4DS801060		CGR552
2015 Hino TV Truck	JHHWDM2H2FK002643		EDFD13
2015 TRAN 350 FORD VAN TV	1FTSF4XV3FKA16884		DJHB72
2018 Ford Translt TV Truck	1FDVU4XV0JKA41295		JGJS41
ARIES TV / GROUT TRUCKS			
2003 Freightliner TV/GROUT Truck	4UZAAPBW53CL99188		W914LW
2008 Hino TV/GROUT Truck	6PVNJ8JT682S52006		LJJV27
2017 Ford TV/GROUT TRUCK	1FDUF5FGT0HEC17085		
2020 GMC TV/GROUT TRUCK	54DK6S168KSG01037		319NZV
VACTOR TRUCKS			
2005 Sterling Vac Truck	2FZHAWDA25AV23315		N1257V
2014 Kenworth Vac Truck	1NKBLJ0X6EJ414824		N58535
2015 Kenworth Vac Truck	1NKBLJ0XXFJ430610		N9216X
2018 Kenworth Vac Truck	1NKZLJ0X6JJ181777		N7201Z
2018 Kenworth Vac Truck	1NKZLJ0X7JJ211921		N1503Y
2019 Kenworth Vac Truck	1NKZLJ0X0KJ259729		P3798B
PICK UP TRUCKS			
2001 Chevy PU	1GCEK14VX1E249082		724PQX
2012 Ford F250 PU	1FT7W2BTXCEB95032		V047RT
2015 Ford F250 4 wheel drive	1FT7W2BT4FEC31026		K975PT
2016 Ford F250	1FT7W2BT6GEA62967		DJHB27
2017 Ford F150 Pick/up	1FTFW1EG9HFA93890		HQR123
2019 Ford F550 Dump Truck	1FD0W5HT7KED02963		KZKS84
TRAILERS			
2015 LARK CARGO TRAILER	5RTBE2027FD043161		240QRL
2014 Utility Trailer	4YNBN1014DC072034		CVSV30
2007 Haulmark 24' Trailer	16HB24257G091999		003IMH
2006 HAULMARK 14'TRAILER	16HCB2166G077708		850PQX



DATE: 2/27/2020

TO: City of St. Augustine, FL
ATTN: To Whom It May Concern

RE: RFP No. PW2020-06 Sanitary Sewer Cleaning, Inspection
SUBJ: Hammer Tap/Tuberculation Removal Letter

Underground Pipeline Rehabilitation, Inc. (UPR) has been doing work for Insituform Technologies, Inc. (ITI) for over 20 years in the Southeastern United States. During this time period we have performed many services which include pipeline cleaning, cctv inspection, point repairs, open cut replacement, manhole replacement/installation, clean out installation and pipe bursting with HDPE. UPR has removed in excess of (800) hammer taps and cut/removed tuberculation in excess of 15,000 linear feet of DI/CI sewer main. Please feel free to contact me if you need any additional information.

Sincerely,

Rodney N. James
Underground Pipeline Rehabilitation, Inc. (UPR)
(912) 647-0942 (Office)
(912) 288-0392 (Cell)

VEHICLE/ EQUIPMENT LIST

(This form must be completed and included in proposal submittal under Tab 1 or the Proposal will be determined to be Non-Responsive)

In the space below, each Firm shall list all current vehicles and equipment as required in Minimum Qualifications (Item 8r. through v., Page 8).

Equipment	Quantity Owned	Quantity Leased	Comments
Jetter Truck - International, Sterling, Ford	7		
Pick up Trucks - F150 & F250	9		
Flatbed Trucks - International & Ford	4		
Boiler Trucks - International	4		
Tool Trailers - International & Brooks	9		
r. Pan & Tilt CCTV Camera	5		Aries PE2620
s. Push & Launch Type Lateral Camera	3		Owned by sub - BLD
t. Digital (MPEG) Video Capture System	4		Located on all TV Trucks
u. PACP Compliant Software	4		Pipe Tech(PACP6)
			IT Pipes (PACP7)
TV Trucks International	4		
Vacuum Truck	3		Owned by Sub - Proline

EQUIPMENT LIST



St	Aegion Unit	VIN	Make Name	VIN Model	Status	Short Descrip	Model
FL	PTK8522	1FTFW1EF6CFB90724	FORD	F150	Active	PICKUP	2012
FL	ESC7215	1FMCU93G49KA59841	FORD	ESCAPE	Active	SUV	2009
FL	FBK7738	1HTJSSKK1CJ383649	INTERNATIO	TERRASTAR	Active	FLATBED	2012
FL	FBK7742	1HTJSSKK3CJ383653	INTERNATIO	TERRASTAR	Active	FLATBED	2012
FL	FBK8869	1FD0W5GT2EEB53738	FORD	F550	Active	FLATBED	2014
FL	FBK8898	1FD0W5GT9EEB69158	FORD	F550	Active	FLATBED	2014
FL	JTK8962	1FDUF5GT7FEB13013	FORD	F550	New	TRUCK JETTER	2015
FL	JTK9143	2NKHMM7X1FM447713	KENWORTH	T270-T370	New	TRUCK JETTER	2015
FL	PTK7320	1FTSW2BR7AEA18157	FORD	F250	Active	PICKUP	2010
FL	PTK7323	1FTSW2BR7AEA18160	FORD	F250	Active	PICKUP	2010
FL	PTK7724	1FTFW1EV9AFC92443	FORD	F150	Active	PICKUP	2010
FL	PTK7725	1FTFW1EV0AFC92444	FORD	F150	Active	PICKUP	2010
FL	PTK7736	1FT7W2B62BEA86752	FORD	F250	Active	PICKUP	2011
FL	PTK8796	1FT7W2B67EEA61740	FORD	F250	Active	PICKUP	2014
FL	PTK8797	1FT7W2B69EEA61741	FORD	F250	Active	PICKUP	2014
DV	141414		MISCELLAN	KELLER TRIP	Active	DUMMY VEH	2003
FL	ACR7096	4FVCBBFA08U400392	EQUIPMENT	INGERSOL	Active	AIR COMPRESS	2008
FL	BTk5549	1HTWNAZT65J153467	INTERNATIO	7500	Active	TRUCK BOILER	2005
FL	BTk7227	1HTWNAZT8AJ224694	INTERNATIO	7500	Active	TRUCK BOILER	2010
FL	BTk7430	1HTWNAZT2BJ336912	INTERNATIO	WORKSTAR 7500	Active	TRUCK BOILER	2011
FL	CHR5170	1B9US16203M274037	TRAILER	SL-162-E BROOKS	Active	TRL CHIP	2003
FL	CHR5699	1B9US16235M274147	BROOKS BRO	CHP TRAILER	Active	TRL CHIP	2005
FL	CRN5879	2FZHATDC04AL06490	STERLING	L7500 SERIES	Active	TRUCK CRANE	2004
FL	FBR9151	16VGX2022E2048008	BIG TEX TR		Active	TRL FLATBED	2014
FL	ITK1502	1HTHCADROYH312098	INTERNATIO	F-8100	Active	TRUCK BOILER	2000
FL	JTK2501	2FZHRJAA7XAA73361	STERLING	L7501	Active	TRUCK JETTER	1999
FL	JTK5426	1HTWKAZR65J045993	INTERNATIO	7500	Active	TRUCK JETTER	2005
FL	JTK5650	1HTWKAZR35J157599	INTERNATIO	7500	Active	TRUCK JETTER	2005
FL	JTK7112	1HTMKAAN59H102309	INTERNATIO	4400	Active	TRUCK JETTER	2009
FL	JTK7114	1HTMKAAN39H102311	INTERNATIO	4400	Active	TRUCK JETTER	2009
FL	LDR10657	789884	EQUIPMENT	520 JCB LOADALL	Active	FORK LIFT	2000
FL	RFR7170	1B9UP13188M274128	BROOKS	BROS UTILITY	Active	TRL RFM	2008
FL	RFR7469	1B9UP1314AM274018	BROOKS	BROS UTILITY	Active	TRL RFM	2010
FL	TTK7225	1HTMMAAN05H121063	INTERNATIO	4300	Active	TRUCK TOOL	2005
FL	TTK7226	1HTMMAAN25H121064	INTERNATIO	4300	Active	TRUCK TOOL	2005
FL	TTR7182	4DYGS242X91028685	TRAILER	GNALRAN20	Active	TRL TOOL	2009
FL	TTR7183	4DYGS242X91028671	TRAILER	GNALRAN20	Active	TRL TOOL	2009
FL	TTR7184	4DYGS242891028670	TRAILER	GNALRAN20	Active	TRL TOOL	2009
FL	TVK5372	1HTMNAAL65H101623	INTERNATIO	4300 LP	Active	TRUCK TV	2005
FL	TVK7091	1HTMNAAL67H522793	INTERNATIO	4300 LP	Active	TRUCK TV	2007
FL	TVK7189	1HTMNAALX9H143900	INTERNATIO	4300 LP	Active	TRUCK TV	2009
FL	TVK7407	1HTMNAAL4BH319216	INTERNATIO	DURASTAR 4300	Active	TRUCK TV	2011
FL	UTR5796	4P7U816283F002800	LWOLF	LW16T	Active	TRL UTILITY	2003

Equipment listed meets all bid requirements and is utilized per Insituform's ISO 9001 certified quality assurance program



CCTV Inspection Truck

- Air compressor, single stage, ½ hp, 0.95 cfm delivery at 90 psi
- 19" LCD flat panel monitor, TV/PC viewing, mounted to control room desktop
- 19" LCD flat panel monitor, PC viewing, mounted to control room desktop
- 19" LCD flat panel monitor, TV viewing, mounted rear facing in equipment room
- Digital Video Recorder system
- Rack-mounted computer and video overlay system, including Pipetech Scan software and license
- Color TV power control unit, multi-conductor, modular control center mount, with:
 - Aries PE2720 "Illumi-Zoom" multi-conductor
 - pan and tilt radial view
 - LED-illuminated
 - zoom
 - color sewer TV cameras
- Desktop dual mode camera controller including:
 - joystick for axial rotation and pan and tilt angle
 - remote focus and zoom in/out
 - home, diagnostics, iris open/close, Starlite, preset buttons, and Camera recharge kit
- Aries TR2000 "Taurus" self-propelled tread drive camera transporter for 6" to 30" lines, components including:
 - Television cable reel with power level wind, electric motor drive, and multi-ratio manual transmission
 - 24-pin switchover and test cable system, SYS171 with cutter controller breakout to desktop





EQUIPMENT LIST

YEAR	MAKE	MODEL
ARIES TELEVISION GROUT TRUCKS:		
2018	Ford	Transit
2017	Ford	F550
2015	Ford	Transit
2014	Isuzu	NPR
2005	GMC	3500
2003	Freightliner	Columbia
COMBO SEWER TRUCKS:		
2018	Kenworth	Vactor
2017	Kenworth	Vactor
2015	Kenworth	Vactor
2014	Kenworth	Vactor
2005	Sterling	7501
SEWER JETTER TRAILERS:		
2005	Peterbuilt	335
2001	Sterling	7501

DRUG-FREE WORKPLACE FORM
(Submitted under TAB 1)

The Respondent, (business name) Insituform Technologies, LLC, in accordance with Section 287.087, F.S., hereby certifies that Respondent does the following:

1. Publishes a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Notifies employees, via the statement specified in paragraph 1, above, that, as a condition of working on the contractual services that are under Proposal, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or *nolo contendere* to, any violation of Chapter 893, F.S. or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five days after such conviction.
3. Gives each employee engaged in providing the contractual services that are under Proposal a copy of the statement specified in paragraph 1, above.
4. Informs employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations
4. Imposes a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.
5. Makes a good faith effort to continue to maintain a drug-free workplace through implementation of Section 287.087, F.S.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.

By:  Janet Hass

Title Contracting & Attesting Officer

Date: March 2, 2020

APPROACH TO SAFETY



Insituform Technologies, LLC Core Values

Our core values define who we are



ZERO INCIDENTS ARE POSSIBLE.

Every Aegion employee is expected to deliver best-in-class safety performance at all times.



DO WHAT'S RIGHT.

Honesty and integrity guide our decision-making, our actions and our relationships with customers, colleagues, stockholders and communities.



WE SOLVE PROBLEMS.

We support our customers' success by understanding better than anyone how to identify and solve problems.



RESULTS MATTER.

We own the consequences of our actions and realize we are ultimately accountable to our customers, stockholders and each other.

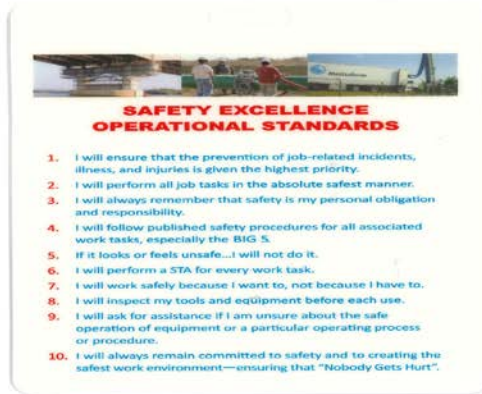


BE BETTER.

We never settle for the status quo and strive each day to do better and to be better.

Safety is a core value at Insituform. We believe in total company involvement and individual personal commitment to our safety culture. We believe that all occupational incidents and injuries are completely preventable. We wholeheartedly believe that zero incidents are possible.

All Insituform employees and subcontractors are empowered with "Stop Work Authority" and are expected to utilize it to correct and eliminate unsafe work conditions and unsafe acts.



APPROACH TO SAFETY



Insituform Safety Training Overview for Field/Crew Employees

All newly hired employees assigned to field work activities receive extensive safety training prior to performing field work, including:

- OSHA 10-hour construction
- Confined space entry

All field employees receive at least 4 days of safety training annually. All Insituform field employees receive first aid/CPR/AED training every 2 years.

In addition, all Insituform crew Superintendents attend 3 days of Superintendent Safety Qualification Training annually at the Chesterfield Training Campus.

Safety Awards

Kyle Reiser's crew based out of Jacksonville worked incident free in 2019.

Jason Burnell's crew based out of Central Florida have worked incident free for the past 4 years (2016 through 2019).

Florida based crew managed by Kevin Morrell earned the Southeast Safest Crew Award in 2018. Morrell's crew has worked for more than 3 years consecutively with zero incidents (no first aid cases or recordable injuries) and zero vehicle accidents.



Insituform Technologies, LLC
6966 Business Park Blvd.
Jacksonville, FL 32256
Tel: 904-886-3762
Fax: 904-886-3751
www.insituform.com

Memorandum

To: All Employees

From: Frank Noonan, Infrastructure Solutions Platform Safety Director

Re: Safety Vision

I want to share with each of you my safety vision for our company. I also want to thank the many dedicated, professional and caring people who have helped so much in fostering awareness and improvements to our safety process over the past several years. With invaluable input and insight from the field and with full support from senior management, we are on the verge of taking our company to the highest levels in the area of safety.

My vision has several, crucial components, but to be truly successful, we must all share the same vision. Every employee has an impact daily on whether we succeed or fail, so please be very aware of everything you do and say regarding our safety process.

The first component is Management Leadership and Commitment. I am very proud of our senior executive management for their personal commitment to safety as a core company value. These executives will be demonstrating their commitment by defining safety program goals, clearly communicating our safety and health policy, and holding line management accountable for safety implementation. The “tone at the top” is loud and clear – safety comes first.

The Communication element requires information to flow freely up and down in the company, as well as across business units and among departments. You will see opportunities for you to provide safety feedback via network “Smartsheet App’s” on the web such as safety suggestions, Hazard Recognition and Near Miss Reports, Job Observations, Safety Alerts, and more. We need all Near Miss incidents reported timely, so we can focus our efforts based on useful and reliable leading indicators.

Assessments and Audits are essential to make sure we understand and consistently follow the procedures that are put in place to keep all of us safe. If there are gaps in our compliance, we must respond appropriately, including renewed evaluations of our procedures or providing additional training to close the gaps. Audits give us the opportunity to observe how people work so we can adjust any at-risk behavior before an injury occurs.

Superior Pre-planning is another key element. Early identification of special or unusual risks in our work activities allows us to eliminate or minimize those risks, thus keeping our employees safer and making our jobs more efficient. For this aspect, we have developed a Safety Task Assignment (STA) procedure that aligns with the Site-Specific Safety Plan (SSSP). The STA will be used at the



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preplanning phase, will flow into project management, and then will properly remind employees daily of a Safety topic at their workplace.

Motivation and Involvement is also a very high priority element for success. Supervisors must encourage compliance by their employees, and management and supervisors must appropriately recognize superior safety effort. All employees must support the safety process, whether by participating in local or national safety committees, submitting suggestions, giving positive constructive feedback or intervening with a fellow worker seen about to commit an at-risk behavior to provide support to management.

Orientation and Training is an important element that will continuously evolve to reflect our progress toward our vision. By sharing information and incorporating new practices and lessons learned into our training programs, we can learn from each other and avoid re-inventing the wheel. One of our goals is for every new field employee to receive basic Safety orientation training on the first day of employment, followed by specific competency training as soon as practicable. The new Quarterly Safety Training Day is the central forum for competency training and reviewing recent relevant events. Effective training methods will vary appropriately based on the learning objectives. Knowledge checks will be used to verify understanding, and all training must be documented to verify consistency.

The last element is our formal, written Operational Safety Programs. Our company looks beyond basic regulatory compliance – we strive to manage our safety process in the best way, which often exceeds minimum legal requirements. We have been reviewing and updating our well-developed procedures including programs such as Confined Space Entry, Traffic Control, etc. We will have a refreshed ISP Safety Manual, which will be supplemented with Aegion Corporate Safety Manual. Each of these elements and the support of every employee is crucial for our company to provide a zero injury Safety culture. We want to succeed for the well-being of our fellow employees and because we know that safer operations are more efficient and profitable. Everyone is expected to join the effort to continuously improve the way we work as a part of our global vision for Aegion success.

If you have any safety questions or concerns, please feel free to talk with your supervisor, your Area Safety Manager, or me. I am at your disposal.

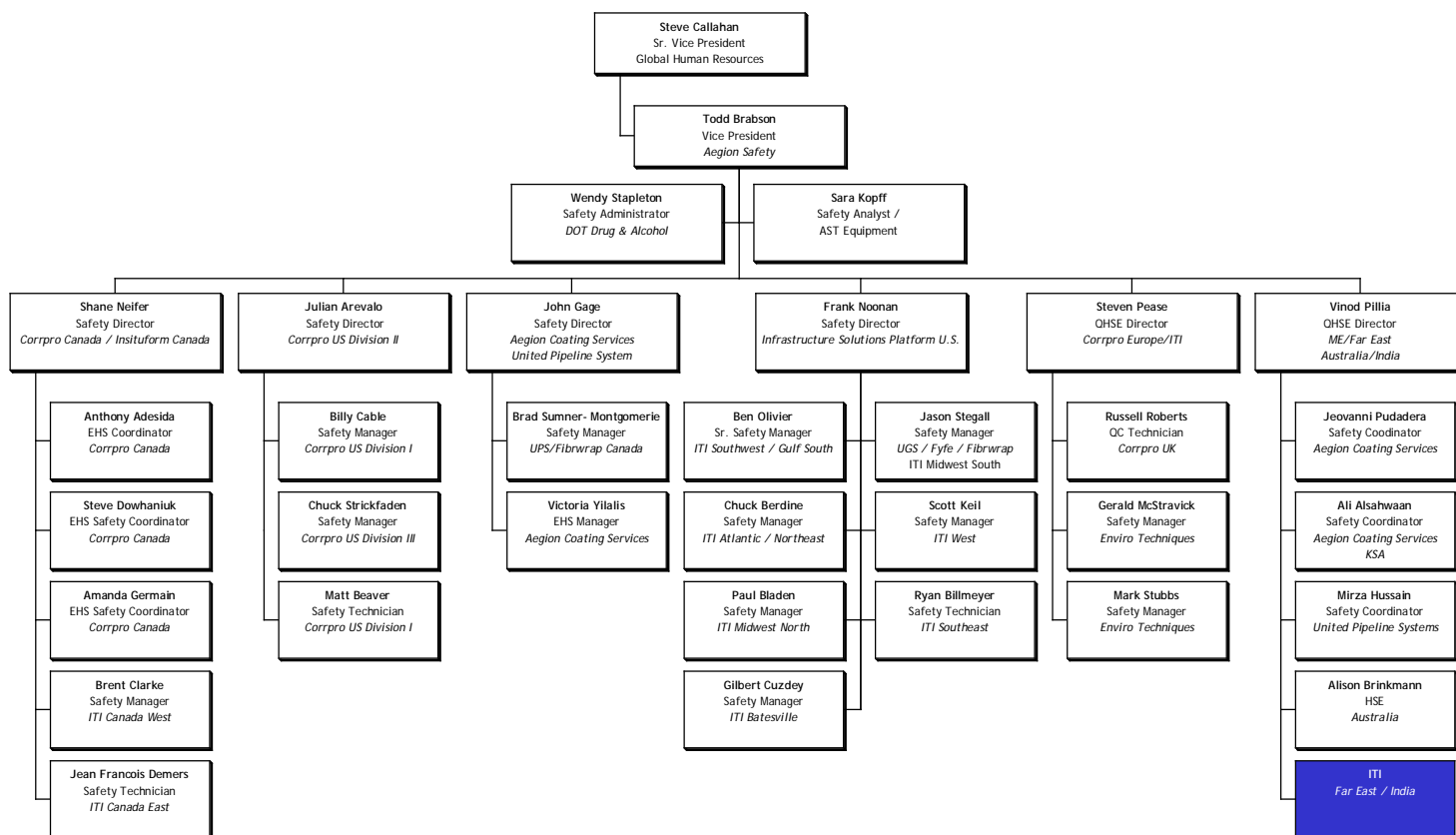
Have a safe day and safer one tomorrow!

A handwritten signature in black ink that reads 'Frank Noonan'.

Frank Noonan, REM, CHST, CESCO
Infrastructure Solutions Platform Safety Director



Aegion ISP and CPP Safety



CAROL HENZLER
SENIOR ACCOUNT MANAGER

September 9, 2019

To Whom It May Concern

RE: **Insituform Technologies, LLC**
(a subsidiary of Aegion Corporation)
Insituform Technologies USA, LLC
(a subsidiary of Insituform Technologies, LLC)

Following is our insured's "interstate" experience mod rating factors, based on worksheets received and promulgated by NCCI:

<u>Effective</u>	<u>Promulgated</u>	<u>Factor</u>
7/1/19*	9/4/19	.76
7/1/18*	9/4/19	.70
7/1/17*	2/27/19	.71
7/1/16*	12/5/16	.80
7/1/15*	6/9/15	.78

*Experience rating combined with Aegion Corporation subsidiaries.

Sincerely,

LOCKTON COMPANIES, LLC



Carol Henzler, CIC
Senior Account Manager

Phone #314-812-3284
Fax #314-812-6584



IN CASE OF EMERGENCY PLEASE CALL 911

WHO DO YOU CALL?

NEAR MISS

<https://app.smartsheet.com/b/form/ee4dc628bc2748c8999f9f925a387d80>

INJURY

In USA – Health Bridge (800) 633-4350

In Canada - Call Safety Manager

AUTO ACCIDENT

ARI 1-866-735-4648 (US)

ARI 1-800-363-7676 (Canada)

DRUG TESTS

In USA -DISA 1- 281-673-2400

In Canada - CannAmm 1-800-440-0023

Environmental

Dennis Pivin, VP Environmental & Health 314-258-2996 Kyle Rowland, Env. Manager 636-248-4790
Esmeralda Herrejon, Environmental Admin 636-445-0157

SAFETY SUGGESTIONS

Use the Aegion Link under Favorites on Internet Explorer OR use the following link

<https://app.smartsheet.com/b/publish?EQBCT=e01ef7ae996c4158961074bc9de35e02>

SAFETY SERVICES DEPARTMENT

Todd Brabson - VP - Safety

email tbrabson@aegion.com Work: 330-241-6699 Cell: 440-289-6244

Aegion

Wendy Stapleton - Safety Administrator, DOT Drug & Alcohol
wstapleton@aegion.com 330-410-5233

Sara Kopff - Safety Analyst
skopff@aegion.com Cell: 636-577-9005

Kerry Kaminski - OQ Manager
kkaminski@aegion.com Home: 440-427-1411

Jen Hudgens - DOT Manager/Transport Canada
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REGIONAL EQUIPMENT COORDINATORS / MANAGERS

Neil Straussner - Midwest
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Joe Kelso - Midwest
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Adrian Baty - Southwest
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Steve Smith - West
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Insituform Technologies - USA

Frank Noonan - ISP Safety Director
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Ben Olivier - Sr. Safety Manager for Southwest & Gulf South
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Chuck Berdine - Safety Manager for Atlantic
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Paul Bladen - Safety Manager for Upper Midwest
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Ryan Billmeyer - Safety Technician for Southeast
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Scott Keil - Safety Manager for West
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Jason Stegall - Safety Manager for Lower Midwest
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Gilbert Cuzdey - Safety Manager for Manufacturing
gcuzdey@aegion.com Cell: 662-654-5134

Insituform Canada West

Brent Clark - Safety Manager
brentclark@aegion.com Cell: 780-893-9573

Insituform Canada East

Paul Masotti - Safety
[Paul Masotti - Safety](mailto:PaulMasotti-Safety) Cell: 905-714-5206

Jean-Francois Demers - Safety
jdemers@aegion.com Cell: 514-216-8534



*Revised 11/22/19

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2019U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
<u>0</u>	<u>1</u>	<u>2</u>	<u>4</u>
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
<u>7</u>	<u>52</u>
(K)	(L)

Injury and Illness Types

Total number of... (M)			
(1) Injury	<u>7</u>	(4) Poisoning	<u>0</u>
(2) Skin Disorder	<u>0</u>	(5) Hearing Loss	<u>0</u>
(3) Respiratory Condition	<u>0</u>	(6) All Other Illnesses	<u>0</u>

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name Instituform Technologies LLCStreet 17988 Edison AvenueCity Chesterfield State MO Zip 63005

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

1 6 2 3
OR North American Industrial Classification (NAICS), if known (e.g., 336212)
2 3 7 1 1 0

Employment information

Annual average number of employees 562Total hours worked by all employees last year 1,531,795

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Todd Brabson
Company executive

Vice President, Safety
Title

330-241-6699
Phone

1/30/2020
Date

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 2018



U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an injury and illness incident report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name Insituform Technologies LLC
City Chesterfield State MO

Identify the person		Describe the case		Classify the case		Enter the number of days the injured or ill worker was:		Check the "injury" column or choose one type of illness:									
(A) Case No.	(B) Employee's Name	(C) Job Title (e.g., Welder)	(D) Date of injury or onset of illness (mo./day)	(E) Where the event occurred (e.g. Loading dock north end)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (e.g. Second degree burns on right forearm from acetylene torch)	CHECK ONLY ONE box for each case based on the most serious outcome for that case:		Away From Work (days)	On job transfer or restriction (days)	(M) Injury	Skin Disorder	Respiratory Condition	Poisoning	Hearing Loss	All other illnesses		
						Death	Days away from work	Remained at work									
								Job transfer or restriction	Other recordable cases	(K)	(L)	(1)	(2)	(3)	(4)	(5)	(6)
						(G)	(H)	(I)	(J)								
18004	Nathan Green	Superintendent	1/22/18	Jobsite	Burned back and shoulder from hot water		x			36	30	x					
18019	David Brown	Laborer	3/8/18	Jobsite	Sutures to right calf after material fell from fork lift and lacerated leg				x			x					
18036	Jesse Couillard	Superintendent	4/18/18	Jobsite	Cut thigh with knife while cutting material. He received stitches.				x			x					
18075	John Peek	Field Engineer	6/29/18	Jobsite	He lifted a water meter over the side of his truck and strained his right shoulder.				x			x					
18097	Roman Rodela	Laborer	8/21/18	Jobsite	Thumb was caught between bumper and hitch. Received stitches to right thumb.				x			x					
18110	Raukeen Foreman	Foreman	9/18/18	Equipment storage yard	Employee drained the boiler at the end of his shift at the yard. He had taken his boots off already. When he stepped down in socks and slippers, he slipped in the mud and when he tried to catch himself, he cut his left pinky finger and burned the top of his foot in the hot mud. Treated laceration with dermabond and burn with silvadene.				x			x					
18115	Sherard Berry	Install Technician	9/27/18	Jobsite	Particles flew into his right eye while he was attending a co-worker cutting a line in the manhole. He suffered abrasion of his right cornea and received prescription eye drops.				x			x					
18111	Jeffrey Chace	Install Technician	9/18/18	Jobsite	Employee rolled his ankle when he stepped out of a vehicle. He tore two ligaments. Treatment included isolation boot and physical therapy.		x			43	21	x					
18077	David Renk	Install Technician	7/6/18	Jobsite	Employee was working over a manhole when something flew out and hit him on the left ear, removing a chunk of it. He received antibiotics.				x			x					
18117	Isaac Akinsanya	Install Technician	9/27/18	Highway	Employee was in a motor vehicle accident and sustained a partial tear in his left shoulder. Attended physical therapy.			x			21	x					
18142	Dane Reid	Boiler Operator	12/3/18	Jobsite	Employee bent over to grab a hose and strained his back. He received prescriptions.		x			14		x					
18136	Keith Ford	Laborer	12/7/18	Jobsite	Employee was struck in the head by a pipe in a scaffold while working and sustained multiple complications with his shoulder and neck.		x			6		x					
18144	James Johnson	TV - Cutter Technician	12/14/18	Jobsite	Debris splashed into employee's right eye while installing an end seal in a manhole. Received antibiotic eye drops.				x			x					
Page totals						0	4	1	8	99	72	13	0	0	0	0	0

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Injury
Skin Disorder
Respiratory Condition
Poisoning
Hearing Loss
All other illnesses

(1) (2) (3) (4) (5) (6)

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2018

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

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Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	4	1	8
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
99	72
(K)	(L)

Injury and Illness Types

Total number of... (M)			
(1) Injury	13	(4) Poisoning	0
(2) Skin Disorder	0	(5) Hearing Loss	0
(3) Respiratory Condition	0	(6) All Other Illnesses	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave. NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name Insituform Technologies LLCStreet 17988 Edison AvenueCity Chesterfield State MO Zip 63005

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

1 6 2 3
2 3 7 1 1 0

Employment information

Annual average number of employees 579Total hours worked by all employees last year 1,428,352

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

Todd Blabson
Company executive

330-241-4699
Phone

VP Safety
Title
4/19/2019
Date

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 2017
 U.S. Department of Labor
 Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.36, in OSHA's Recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
<u>0</u>	<u>1</u>	<u>3</u>	<u>2</u>
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
<u>81</u>	<u>86</u>
(K)	(L)

Injury and Illness Types

Total number of... (M)			
(1) Injury	<u>6</u>	(4) Poisoning	<u>0</u>
(2) Skin Disorder	<u>0</u>	(5) Hearing Loss	<u>0</u>
(3) Respiratory Condition	<u>0</u>	(6) All Other Illnesses	<u>0</u>

Post this Summary page from February 1 to April 30 of the year following the year covered by the form

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instruction, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room N-3844, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment Information

Your establishment name Insituform Technologies LLC

Street 17988 Edison Avenue

City Chesterfield State MO Zip 63005

Industry description (e.g., Manufacture of motor truck trailers)

Standard Industrial Classification (SIC), if known (e.g., SIC 3715)

1 8 2 3

OR North American Industrial Classification (NAICS), if known (e.g., 336212)

2 3 7 1 1 0

Employment Information

Annual average number of employees 705

Total hours worked by all employees last year 1,783,243

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

[Signature]
Company executive

636-530-8000
Phone

V.P. SHAW
Title

1/29/18
Date

APPROACH TO SCOPE OF WORK



Insituform has a thorough understanding of the needs, goals, and objectives of the needs of the City of St. Augustine, based not only on our global industry leading resources, personnel, technology and experience, but locally from the project experience we've gained from city projects dating back to 1997.

Not only is Insituform the creator and industry leader in the field of cured-in-place pipe, our experience is second to none in regards to pipeline rehabilitation, I/I reduction, and meeting the needs of our valued municipal clients. To date, Insituform crews have installed well over 25,000 miles of CIPP (over one hundred million linear feet).

Regardless of our global experience, our local knowledge of the Florida environment and needs of the municipalities in the area is a top priority. We've been fortunate enough call many of the area's municipal entities our clients and enjoy a long-standing history of success in rehabilitating the area infrastructure.

This knowledge and history has allowed us the opportunity to perform sanitary and stormwater rehabilitation in the City of St. Augustine on past projects. Our familiarity with the city, its residents and staff, and rehabilitation needs as it pertains to your upcoming rehabilitation work is unmatched.

To continue with our highest level of rehabilitation services, we aim to employ much of the same successful processes, practices, and approaches that we used in the past. Working safely and expeditiously, our aim is to lessen the impact of the rehabilitation work on the residents of the city, as well as to deliver the highest quality of installation at a competitive price.

Operations for all projects in the St. Augustine area are handled out of our office in Jacksonville, which provides adequate resources for our current and estimated future workloads. Our crews are also some of the most efficient in the industry, all while maintaining industry leading quality standards, maintained by our ISO:9001 manufacturing, wetout, and installation processes.

As the largest provider of Cured-in-Place Pipe (CIPP) rehabilitation services in the world, one of our biggest strengths lies in our resources and crew capacity. In the State of Florida alone, Insituform employs six experienced crews, three of which are based out of the Jacksonville office. Additional Insituform crews are located throughout the Southeast United States, and around the country. Should the need for additional crews arise, we have the ability to rotate crews in and out, and shift resources to areas and projects that need them the most.

Insituform also offers an industry leading range of CIPP, CFRP and HDPE solutions for pressure pipe rehabilitation, servicing water mains and force mains ranging from 6" to 120" in diameter.

Rest assured, our industry leading approaches will incorporate our core values:

1. Zero Incidents are Possible
2. Do What's Right
3. We Solve Problems
4. Results Matter
5. Be Better





CORPORATE BACKGROUND

Insituform Technologies, LLC is a diversified, international corporation specializing in trenchless reconstruction of municipal and industrial pipelines of all types - sewer, storm drain, water, gas oil, chemical process, slurry and nuclear power pipelines. Application sizes range from under 6-inches to over 96-inches in diameter. Based on size, experience, technology, capability and resources, INSITUFORM is the worldwide leader in full-spectrum piping reconstruction contracting.

Insituform's expertise is based on over 40 years of experience spent in the reconstruction of more than 20,000 miles (over 100,000,000 ft.) of pipe. Currently, INSITUFORM offers a full spectrum of trenchless rehabilitation products including Insituform's flagship cured-in-place pipe (CIPP), iPlus Infusion®, iPlus® Composite, Tit Liner® HDPE systems for industrial pipelines and our Insituform Blue® product line for potable water renewal including the InsituMain® System and InsituGuard® HDPE rehabilitation system for transmission and distribution mains, robotic service reinstatement.

The corporate history that encompasses today's worldwide Insituform Technologies, LLC organization derives from a host of resources, people, technology and experience merged from former licensees and affiliates of the original Insituform® pipe reconstruction process.

INSITUFORM is a leader in quality management, becoming the first specialty piping corporation to receive ISO 9000 quality installation certification in 1995

Insituform Technologies is one of the largest trenchless technology companies in the world, with annual revenues exceeding \$914 million in 2010. As of 2011, Insituform is now a wholly owned subsidiary of Aegion Corporation. Aegion stock is publicly held on the NASDAQ exchange under the symbol "AGN".

PERSONNEL

Insituform Technologies, LLC's worldwide organization consists of over 3,000 employees. Every specialty and function associated with an international, technology-driven business is incorporated. Outside of manufacturing operations, the predominance of INSITUFORM personnel engage in project crew duties for pipeline reconstruction.

INSITUFORM maintains and staffs an extensive Research and Development facility engaged in new product and technical installation development. Experts are available to assist operations units in developing specialized solutions to particular client needs for underground piping system analysis and reconstruction.

INSITUFORM maintains a centralized design team at the world headquarters in St. Louis, Missouri with responsibility for ensuring that service conditions are met by products in each application. When necessary, special industrial design considerations and constraints such as corrosion, abrasion, unusual loading, pressure, temperature, etc. are fully included in specific application designs. INSITUFORM has assigned technical market managers to specific segments who have intimate knowledge of process and facility operations and are able to provide advice and field technical assistance in special applications as may be required to meet critical or unusual client needs.

By nature, field applications of pipeline service, assessment and reconstruction activities are highly regionalized. In the United States, INSITUFORM meets the needs of local municipal, industrial and military clients for responsive service by deploying personnel at strategic locations to minimize the cost and burden to clients of extensive mobilization. As an integrated company, sharing of expert personnel and specialized equipment between locations in response to client and project needs is part of normal operations.

QUALITY ASSURANCE

A strategy goal of Insituform Technology is operational excellence. This goal of quality assurance is being achieved on two fronts.

Best Practices Program: First, INSITUFORM has completed its long-term goal of merging all licensees throughout the United States and solidifying relationships with worldwide subsidiaries and affiliates. Achieving uniform high standards of quality across all operating units is essential to ensure long-term service to client needs. In doing so, INSITUFORM has developed comprehensive bench-marking studies to identify the “Best Practices” of the most efficient and best quality manufacturing and installation procedures for each product line, and can therefore share these best practices with INSITUFORM’s regional offices, subsidiaries, and licensees throughout the world. INSITUFORM believes that the only way to guarantee quality is to integrate product development, manufacturing and installation under a best practices program, coupled with ISO 9001 Quality Management Programs.

ISO 9001 Quality Assurance Program: INSITUFORM’s second long-term goal is to maintain ISO 9001 quality certification for its manufacturing facilities. This certification process was completed in 1995. ISO certification is not only consistent with the goal of achieving operational excellence for the municipal market, it is an essential requirement for the industrial market, where ISO certification has become an increasingly greater requirement for acceptance as a qualified supplier.

Quality Assurance Inspection Program and Training: A pilot program for the detection and recording of internal non-conformance was established. Persons were selected and trained for conducting internal auditing, probably the most important aspect of ISO because it provides ongoing self-evaluation of the effectiveness of the quality system. Every member of the organization is familiar with, and fully committed to the company’s “Quality Policy” and non-conformance identification program.

Internal Audit Findings: Predetermined elements of the quality system are audited each month, and at year’s end every ISO 9001 requirement will have been reviewed at least once. Findings are reported to the manager responsible for the appropriate department for resolution.

Management Review and Client Review: At least twice a year, managers meet to review and assess the quality system as a whole. Quality objectives are evaluated and amended or increased as appropriate. Resource needs are identified and action plans formulated. Once a project is completed, the client receives a Customer Survey form. This comprehensive form is INSITUFORM’s report card which identifies project success, as well as areas where improvement is suggested.

INSITUFORM

The rehabilitation processes offered by Insituform were developed to provide a means of reconstructing existing pipe, conduit or passageways without extensive excavation. Some typical applications include:

1. Halting settlement by stopping the infiltration of soil and bedding material which often accompanies groundwater infiltration and can cause soil voids and shifting ground in gravity pipelines.
2. Eliminating infiltration of groundwater through joints, breaks and missing sections of gravity pipeline.
3. Increasing the capacity of existing pipelines by smoothing the interior surface and providing smooth transitions over joints and protrusions.
4. Reducing maintenance and increasing capacity by reducing deposits and eliminating root intrusions into gravity pipelines.
5. Protecting the pipe from attack by corrosive chemical effluent and vapors.
6. Eliminating the exfiltration of pollutants and chemicals into surrounding groundwater aquifers through joints and cracks in pipelines.
7. Strengthening the existing pipe by the installation of a tight fitting Insituform® CIPP within the old, thereby bridging joints, cracks and disconnected pipes into a single continuous conduit.

Briefly, here are just a few of the benefits realized from the reconstruction of pipelines using the Insituform[®] cured-in-place pipe (CIPP) process:

Virtually eliminates excavation problems - Depending on the type of pipe or passageway to be reconstructed (sewers, drains, or conduits), excavation can virtually be eliminated. Existing access (sewer manholes) is usually sufficient. Side connections can generally be 'reinstated' by cutting out from within. Bends can be negotiated.

Restores full size capacity, reduces maintenance - These tight-fitting pipes are continuous over pipe joints, openings and faults, and the capacity is nearly always increased. The smoothness also reduces deposits because there are no places for deposits to form, thereby reducing maintenance.

Builds corrosion-resistant pipe, resists chemical attack - In the case of the Insituform process, various thermosetting resins can be selected to resist the corrosive effects of the effluent.

Builds a continuous pipe - (a new pipe within the old) - Insituform[®] CIPP bridges breaks and missing sections of pipe eliminating infiltration, exfiltration or loss of product in pressure pipes. Insituform fits tightly and bridges disconnected pipes into a single continuous pipe.

Reconstructs unusually shaped pipes without loss of capacity - Elliptical, egg-shaped, flat bottom horseshoe or rectangular conduits can be reinstated to their existing shape by the tight fitting Insituform process.

Accomplishes these things in sizes from 6- to 96-inches in diameter – Insituform[®] CIPP has been constructed in these sizes and may be applicable to those beyond.

Solves difficult jobs - In addition to negotiating bends, it is possible to reconstruct remote sections inaccessible to wheeled vehicles (e.g. inside building) with the Insituform process. In addition to being installed without excavation, Insituform[®] CIPP has been installed where access to only one end is feasible (vertical wells). Also, it is possible to reconstruct pipelines with reducers or only a portion of a pipeline.

Solves stringent time restraints - Preparation time is reduced by eliminating street openings and risk of damage to other utilities. Insituform[®] CIPP can generally be installed and completed in less on-the-job time than traditional open cut construction methods.

Offers more convenience to commerce and public - Little inconvenience is caused to the public, commercial business or existing utility operations because excavations are generally eliminated. Little work space is needed for installation. This alone means fewer restrictions on access to property and shops and greater assurance of safety.

Longevity - For normal applications, such as gravity sewers, the service life of Insituform[®] CIPP can be expected to approach fifty years. Service life of Insituform[®] CIPP is a function of the temperature, pressure, velocity, and chemical and abrasive properties of the materials being carried.

Custom-Engineered – Insituform[®] tubes are custom-engineered to optimize total life performance using time-proven formulas. These take into account requirements for diameter, length, condition of pipe, flow rates, temperature, pressure and corrosiveness of the materials being carried.

INSITUFORM, STANDARD INSTALLATION PROCESS

The standard Insituform[®] process has been used throughout the world for the rehabilitation of over 25,000 miles, of pipe ranging in size from 6" to 96". The process uses a resin-impregnated, flexible felt tube which is installed into and through an existing pipe using water or air pressure. While the liner is held tightly against the host pipe, hot water or steam is circulated through a heat exchanger to cure the thermostat resin.

The flexible resin tube can accommodate various pipe shapes – round, square, rectangular, oval or arched. The Insituform[®] tube can negotiate bends, elbows, missing sections, offset joints, misalignment and steep slopes. Standard applications include process and sanitary sewer, storm drains, process lines, slurry lines, force mains and siphons. Resin systems used include polyester, vinyl ester and epoxy, designed to meet service requirements. Installation lengths typically range from 250 feet to over 2,500 feet, depending on pipe size and condition. Service laterals are re-opened internally using robotic cutters.

Aegion companies operate across the world

The Aegion family of companies can be found where we are most needed, onshore and offshore, in big cities and remote locations throughout the world. With operations across the United States, Canada, South America, Europe, Australia, the Middle East and Asia-Pacific, we work in geographic markets where demand for our products and services is strong.

AEGION
World Headquarters
United States
Missouri – St. Louis
636.530.8000

FIBRWRAP

Headquarters
California – San Diego
858.642.0694

Area Headquarters
Fibrwrap Canada
Canada – Vancouver
(Coquitlam)
604.541.5429

Operations
United States
California – Rancho Cucamonga
California – Sacramento
Florida – Miami
Georgia – Atlanta (Valdosta)
Hawaii – Honolulu
Illinois – Chicago (Oswego)
International
Canada – Moncton, NB
Chile – Santiago
Colombia – Bogota
El Salvador
Guatemala
Malaysia – Kuala Lumpur
Mexico
Panamá
Peru – Lima

FYFE

Headquarters
United States
California – San Diego
858.642.0694

Area Headquarters
Fyfe Asia
Borneo – Bandar Seri Begawan
China – Hong Kong (Sha Tin)
Indonesia – Tangerang
Japan – Tokyo
Malaysia – Kuala Lumpur
Singapore
65.6898.5248
Fyfe Latin America
El Salvador – San Salvador (San Francisco)
503.2223.6098

INSITUFORM

Headquarters
United States
Missouri – St. Louis
636.530.8000

Area Headquarters
Insituform Asia-Pacific
Singapore
65.6898.5248
Insituform North America
Missouri – St. Louis
636.530.8000

Operations
United States
Alabama – Birmingham (Bessemer)
Arizona – Tempe
California – Los Angeles (Irvine)
California – Sacramento (Antelope)
Colorado – Denver (Littleton)
Florida – Jacksonville
Florida – Miami (Medley)
Florida – Tampa
Georgia – Atlanta (Cartersville)

Hawaii – Honolulu (Kapolei)
Illinois – Chicago (Orland Park)
Indiana – Indianapolis
Louisiana – Hammond
Maryland – Baltimore
Massachusetts – Boston (Charlton)
Michigan – Detroit (Howell)
Minnesota – Minneapolis (White Bear Lake)
Missouri – Bridgeton
Missouri – Kansas City (Belton)
Missouri – St. Louis (Chesterfield)
North Carolina – Charlotte (Monroe)
Ohio – Cincinnati (Lebanon)
Oregon – Portland (Tualatin)
Tennessee – Nashville (LaVergne)
Texas – Fort Worth
Texas – Houston
Texas – San Marcos
International
Australia – Brisbane (Clontarf)
Australia – Newcastle
Australia – Sydney (St. Marys)
Canada – Calgary
Canada – Edmonton
Canada – Hamilton
Canada – Montréal
China
Denmark – karlslunde
France – Tremuson
India – Delhi
UAE – Dubai
The Netherlands –

Zoetermeer
Spain – Madrid
United Kingdom – Wellingborough
Manufacturing
United States
Mississippi – Memphis (Batesville)
International
United Kingdom – Wellingborough

Wet Out Facilities
United States
Alabama – Birmingham (Bessemer)
Florida – Ocala
Hawaii – Honolulu (Kapolei)
Indiana – Indianapolis
Pennsylvania – Scranton (Olyphant)
Texas – Fort Worth (McGregor)
Utah – Cedar City
International
Australia – Brisbane (Clontarf)
Australia – Sydney (St. Marys)

Canada – Edmonton
Canada – Montreal
Croatia – Lokve
Denmark – karlslunde
France – Tremuson
Hong Kong
India – New Delhi
Norway – Rade
Spain – Madrid
The Netherlands – Zoetermeer
United Kingdom – Wellingborough

Licensees

[International](#)

Croatia – Rijeka

India

Japan – Tokyo

Kazakhstan

Norway – Rade

South Korea – Seoul

Venezuela – Caracas
(Charallave)

MTC

Headquarters

[United States](#)

Missouri – St. Louis
636.530.3330

Area Headquarters

[MTC Asia-Pacific](#)

Hong Kong
852.2659.0156

[MTC Latin America](#)

El Salvador – San
Salvador (San Francisco)
503.2264.9177

UNDERGROUND
SOLUTIONS

Headquarters

[United States](#)

California – San Diego
(Poway)
858.679.9551

Operations

[United States](#)

Pennsylvania – Pittsburg
(Warrendale)

AEGION COATING
SERVICES

Headquarters

[United States](#)

Texas – Conroe
936.539.3294

Operations

[United States](#)

California – Bakersfield
(Custom Coating)

Oklahoma – Tulsa

[International](#)

Saudi Arabia – Abqaiq

BAYOU

Headquarters

[United States](#)

Louisiana – New Iberia
337.369.3761

Operations

[United States](#)

Louisiana – New Iberia
(Custom Coating)

Louisiana – New Iberia
(Port of Iberia)

Texas – Houston
(Conroe)

Joint Ventures

[United States](#)

Louisiana – New Iberia

Sales

[United States](#)

Texas – Houston

[International](#)

Canada – Calgary

CORRPRO

Headquarters

[United States](#)

Texas – Houston
800.422.7878

Area Headquarters

[Corrpro Canada](#)

Canada – Edmonton
780.447.4565

[Corrpro Europe](#)

United Kingdom –
Stockton-on-Tees
44.1642.614.106

Operations

[United States](#)

California – Los Angeles
(Santa Fe Springs)

California – Oakland
(Hayward)

California – San Diego

Florida – Gainesville
(Chiefland)

Georgia – Atlanta
(Conyers)

Illinois – Chicago
(Streamwood)

Kansas – Hugoton

Louisiana – New Orleans
(Harvey)

Massachusetts – Boston
(Weymouth)

New Mexico – Farmington

Ohio – Medina

Oklahoma – Tulsa
(Sand Springs)

Pennsylvania – West
Chester

Texas – Dallas

Texas – Houston

[International](#)

Canada – Calgary

Canada – Moose Jaw

Canada – Fort St. John

Canada – Grande Prairie

Canada – Montreal

Canada – Regina

Canada – Toronto
(Mississauga)

China – Shanghai

Portugal – Almada

United Arab Emirates –
Dubai

United Kingdom –
London (Redhill)

Manufacturing

[United States](#)

Oklahoma – Tulsa
(Sand Springs)

Sales

[International](#)

United Kingdom – Durley

Joint Ventures

[International](#)

Malaysia – Kuala Lumpur

Saudi Arabia – Al Khobar

UNITED PIPELINE
SYSTEMS

Headquarters

[United States](#)

Colorado – Durango
970.259.0354

Area Headquarters

[United Pipeline Systems
Canada](#)

Canada – Edmonton
780.440.1188

[United Pipeline Systems
South America](#)

Chile – Santiago
56.2.207.4966

Operations

[United States](#)

Colorado – Durango

[International](#)

Argentina

Canada – Calgary

Chile – Antofagasta

Joint Ventures

[International](#)

Mexico – Queretaro

Oman – Muscat

ALLSAFE

Headquarters

[United States](#)

California – Los Angeles
(Irvine)
714.721.6144

BRINDERSON

Headquarters

[United States](#)

California – Los Angeles
(Irvine)
714.466.7100

Operations

[United States](#)

California – Bakersfield

California – Fresno
(Coalinga)

California – Los Angeles
(Carson)

California – San
Francisco (Benicia)

New Mexico – Hobbs

Texas – Midland

Washington – Bellingham

Fabrication

[United States](#)

California – Bakersfield
(Shafter)

California – Bakersfield
(Lost Hills)

SCHULTZ

Headquarters

[United States](#)

California – Los Angeles
(Signal Hill)
562.595.8596

Operations

[United States](#)

California – Bakersfield



Stronger. Safer. Infrastructure.®

Aegion Corporation
17988 Edison Avenue
St. Louis, MO 63005
636.530.8000

www.aegion.com

Aegion®, AllSafe™, Brinderson®, Bayou®, Corrpro®, Fibrwrap®, Fusible PVC®, Fyfe®, Tyfo®, Insituform®, MTC®, Schultz™, Underground Solutions®, United Pipeline Systems® and the associated logos are trademarks of Aegion Corporation and its affiliates in the USA and other countries.

AEG001 10/16
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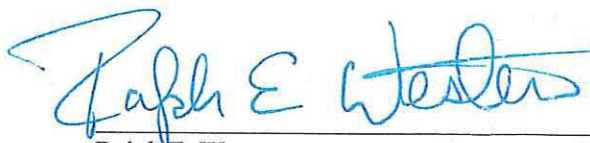
INSITUFORM TECHNOLOGIES, LLC

**PRESIDENT APPOINTMENT OF
CONTRACTING AND ATTESTING OFFICERS**

The undersigned, being the President of Insituform Technologies, LLC, a Delaware Limited Liability Company (the "Company"), and pursuant to the authority set forth in the Limited Liability Company Operating Agreement of the Company, hereby determines that:

1. Christlanda Adkins, Janet Hass, Jana Lause, Diane Partridge, Whitney Schulte, and Ursula Youngblood are appointed as Contracting and Attesting Officers of the Company, each with the authority, individually and in the absence of the others, subject to the control of the Board of Managers of the Company, to: (i) certify and attest to the signature of any officer of the Company; (ii) enter into and bind the Company to perform pipeline rehabilitation activities of the Company and all matters related thereto, including the maintenance of one or more offices and facilities of the Company; (iii) execute and to deliver documents on behalf of the Company; and (iv) take such other action as is or may be necessary and appropriate to carry out the project, activities and work of the Company.
2. Any person previously appointed or serving as a Contracting and Attesting Officer of the Company prior to the date hereof and who is not named above is hereby removed from any such appointment.

Dated: October 31, 2019



Ralph E. Western
President



Insituform Technologies, LLC is a subsidiary of Aegion Corporation

INSITUFORM TECHNOLOGIES, LLC
BOARD OF MANAGERS AND OFFICERS
 (Current as of February 1, 2020)

<u>BOARD OF MANAGERS</u>	
<i>Charles R. Gordon</i>	Member, Board of Managers
<i>David F. Morris</i>	Member, Board of Managers

<u>OFFICERS</u>	
<u>Name</u>	<u>Office</u>
Ralph E. Western	– President
David F. Morris	– Executive Vice President
Mark A. Menghini	– Senior Vice President and Secretary
Kenneth L. Young	– Senior Vice President, Treasury and Tax
John L. Heggemann	– Senior Vice President
Stephen Callahan	– Senior Vice President
Kent W. Bartholomew	– Vice President, Deputy General Counsel and Assistant Secretary
Dennis Pivin	– Vice President – Safety
Larry Mangels	– Vice President, Operational Controller

<u>CONTRACTING AND ATTESTING OFFICERS</u>
Christlanda Adkins
Gina Gurrieri
Janet Hass
Jana Lause
Diane Partridge
Whittney Schulte
Ursula Youngblood

Business Address for Officers and Board of Managers:
17988 Edison Avenue
Chesterfield, MO 63005



Florida Department of Transportation

RON DESANTIS
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

KEVIN J. THIBAUT, P.E.
SECRETARY

April 10, 2019

INSITUFORM TECHNOLOGIES LLC.
17988 EDISON AVENUE
CHESTERFIELD, MISSOURI 63005

RE: CERTIFICATE OF QUALIFICATION

Dear Sir/Madam:

The Department of Transportation has qualified your company for the type of work indicated below. Unless your company is notified otherwise, this Certificate of Qualification will expire 6/30/2020. However, the new application is due **4/30/2020**.

In accordance with S.337.14 (1) F.S. your next application must be filed within (4) months of the ending date of the applicant's audited annual financial statements.

If your company's maximum capacity has been revised, you can access it by logging into the Contractor Prequalification Application System via the following link:

<HTTPS://fdotwpl.dot.state.fl.us/ContractorPreQualification/>

Once logged in, select "View" for the most recently approved application, and then click the "Manage" and "Application Summary" tabs.

FDOT APPROVED WORK CLASSES:

CURED-IN-PLACE PIPE LINING AND REHABILITATION

You may apply for a Revised Certificate of Qualification at any time prior to the expiration date of this certificate according to Section 14-22.0041(3), Florida Administrative Code (F.A.C.), by accessing your most recently approved application as shown above and choosing "Update" instead of "View." If certification in additional classes of work is desired, documentation is needed to show that your company has done such work with your own forces and equipment or that experience was gained with another contractor and that you have the necessary equipment for each additional class of work requested.

All prequalified contractors are required by Section 14-22.006(3), F.A.C., to certify their work underway monthly in order to adjust maximum bidding capacity to available bidding capacity. You can find the link to this report at the website shown above.

Sincerely,

A handwritten signature in blue ink that reads "Alan Autry". The signature is fluid and cursive, with the first and last names being clearly legible.

Alan Autry, Manager
Contracts Administration Office

AA:cj



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

SPECIALTY TESTING SERVICES
5751 Rex Street
Leeds, AL 35094
Johnny Woods Phone: 205 281 2349

MECHANICAL

Valid To: February 29, 2020

Certificate Number: 2963.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests on plastics and plastic pipe:

Test Description

Test Method

Conditioning Plastics for Testing

ASTM D618

Tensile Properties of Plastics

ASTM D638

Flexural Properties of Plastics
(Flexural Strength and Modulus)

ASTM D790

Determining Dimensions of "Fiberglass" Pipe and Fittings

ASTM D3567



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This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 25th day of January 2018.

A blue ink signature of the Vice President of Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2963.01
Valid to February 29, 2020
Revised: January 30, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Mechanical Scope of Accreditation.



Insituform Technologies, LLC
17988 Edison Avenue
Chesterfield, MO 63005
Tel: 636.530.8000
Fax: 636.530.8744
www.insituform.com

February 6, 2020

RE: Installer Certification

To Whom It May Concern:

Please be advised that Insituform Technologies, LLC is vertically integrated pipeline Rehabilitation Company. As such, Insituform is not only the manufacturer of the cured-in-place pipeline rehabilitation system of the same name, but also offers the benefits of the full research and development department, engineers on staff for design of products to suit each individual situation, and regional contracting offices that perform all field services including installation.

This letter shall serve to certify that Insituform Technologies, LLC is authorized to install Insituform products supplied by Insituform Technologies, LLC.

Sincerely,

INSITUFORM TECHNOLOGIES, LLC

Eugene
Zaltsman

Digitally signed
by Eugene
Zaltsman
Date: 2020.02.06
07:53:26 -06'00'

Eugene Zaltsman
Sr. Applications Engineer



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CERTIFICATE OF COMPLIANCE

February 6, 2020

To Whom It May Concern:

This letter certifies that INSITUFORM tubes are manufactured in Batesville, Mississippi, USA, by Insituform Technologies, LLC and meet all relevant specifications for a cured-in-place pipe product: ASTM D 5813, ASTM F 1216, and ASTM F 1743. Insituform tubes have been manufactured in the USA since 1981.

The finished tube is manufactured using multiple layers of polyester felt, with one layer coated with Polypropylene plastic. The layers are cut/slit to the desired width, and sewn concentrically to form the final tube. The coated layer is also sealed at the seam, using an extrusion or taping process. The extrusion process is used on the standard (inverted) tubes. The standard (inverted) tubes are manufactured with the coated layer on the outside.

Felt production is achieved by a non-woven needle punch process using Polyester fiber. The finished product is tested for thickness under a specified load and for tensile strength in accordance with ASTM D 5813. The fabric tube has a minimum tensile strength of 750 psi (5 MPa) in both the longitudinal and the transverse direction. The seam strength of the tube is also tested on a regular basis and also meets or exceeds the minimum tensile strength of 750 psi (5 MPa) in both longitudinal and transverse direction. For Quality Assurance purposes, the material is also tested for weight and thickness.

All standard (inverted) tubes are run through a dye bath prior to shipment to ensure there are no leaks. Following the inspection process all tubes (except InsituMain, which are used in water lines) are printed with yard marks.

All tubes with tapers, transitions, or any change in tube diameter or thickness are produced under the same specifications, with the same materials, and meet the same material testing requirements as the standard tube.

The quality system used by Insituform Technologies, LLC is ISO 9001:2015 certified.

The end use of the Insituform tube is to rehabilitate sewer and drainage pipes to increase the life of the pipe and prevent a dig and replacement of a pipe.

Please contact us directly with any questions you may have.

Sincerely,

INSITUFORM TECHNOLOGIES, LLC

**Eugene
Zaltsman**
Digitally signed by
Eugene Zaltsman
Date: 2020.02.06
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Eugene Zaltsman
Sr. Applications Engineer



Designation: F1216 – 16

Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube^{1,2}

This standard is issued under the fixed designation F1216; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This practice describes the procedures for the reconstruction of pipelines and conduits (2 to 108-in. diameter) by the installation of a resin-impregnated, flexible tube which is inverted into the existing conduit by use of a hydrostatic head or air pressure. The resin is cured by circulating hot water or introducing controlled steam within the tube. When cured, the finished pipe will be continuous and tight-fitting. This reconstruction process can be used in a variety of gravity and pressure applications such as sanitary sewers, storm sewers, process piping, electrical conduits, and ventilation systems.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific precautionary statements, see 7.4.2.

2. Referenced Documents

2.1 ASTM Standards:³

D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents

D638 Test Method for Tensile Properties of Plastics

D790 Test Methods for Flexural Properties of Unreinforced

and Reinforced Plastics and Electrical Insulating Materials

D903 Test Method for Peel or Stripping Strength of Adhesive Bonds

D1600 Terminology for Abbreviated Terms Relating to Plastics

D3567 Practice for Determining Dimensions of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings

D3839 Guide for Underground Installation of “Fiberglass” (Glass-Fiber Reinforced Thermosetting-Resin) Pipe

D5813 Specification for Cured-In-Place Thermosetting Resin Sewer Piping Systems

E797/E797M Practice for Measuring Thickness by Manual Ultrasonic Pulse-Echo Contact Method

F412 Terminology Relating to Plastic Piping Systems

2.2 AWWA Standard:

Manual on Cleaning and Lining Water Mains, M 28⁴

2.3 NASSCO Standard:

Recommended Specifications for Sewer Collection System Rehabilitation⁵

3. Terminology

3.1 Definitions are in accordance with Terminology F412 and abbreviations are in accordance with Terminology D1600, unless otherwise specified.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cured-in-place pipe (CIPP)*—a hollow cylinder containing a nonwoven or a woven material, or a combination of nonwoven and woven material surrounded by a cured thermosetting resin. Plastic coatings may be included. This pipe is formed within an existing pipe. Therefore, it takes the shape of and fits tightly to the existing pipe.

3.2.2 *inversion*—the process of turning the resin-impregnated tube inside out by the use of water pressure or air pressure.

¹ This practice is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.67 on Trenchless Plastic Pipeline Technology.

Current edition approved Aug. 1, 2016. Published August 2016. Originally approved in 1989. Last previous edition approved 2009 as F1216–09. DOI: 10.1520/F1216-16.

² The following report has been published on one of the processes: Driver, F. T., and Olson, M. R., “*Demonstration of Sewer Relining by the Insituform Process, Northbrook, Illinois*,” EPA-600/2-83-064, Environmental Protection Agency, 1983. Interested parties can obtain copies from the Environmental Protection Agency or from a local technical library.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

⁴ Available from American Water Works Association (AWWA), 6666 W. Quincy Ave., Denver, CO 80235, http://www.awwa.org.

⁵ Available from the National Association of Sewer Service Companies, 2470 Longstone Lane, Suite M Marriottsville, MD 21104. http://www.nassco.org/

*A Summary of Changes section appears at the end of this standard

3.2.3 *lift*—a portion of the CIPP that has cured in a position such that it has pulled away from the existing pipe wall.

4. Significance and Use

4.1 This practice is for use by designers and specifiers, regulatory agencies, owners, and inspection organizations who are involved in the rehabilitation of conduits through the use of a resin-impregnated tube inverted through the existing conduit. As for any practice, modifications may be required for specific job conditions.

5. Materials

5.1 *Tube*—The tube should consist of one or more layers of flexible needled felt or an equivalent nonwoven or woven material, or a combination of nonwoven and woven materials, capable of carrying resin, withstanding installation pressures and curing temperatures. The tube should be compatible with the resin system used. The material should be able to stretch to fit irregular pipe sections and negotiate bends. The outside layer of the tube should be plastic coated with a material that is compatible with the resin system used. The tube should be fabricated to a size that, when installed, will tightly fit the internal circumference and the length of the original conduit. Allowance should be made for circumferential stretching during inversion.

5.2 *Resin*—A general purpose, unsaturated, styrene-based, thermoset resin and catalyst system or an epoxy resin and hardener that is compatible with the inversion process should be used. The resin must be able to cure in the presence of water and the initiation temperature for cure should be less than 180°F (82.2°C). The CIPP system can be expected to have as a minimum the initial structural properties given in Table 1. These physical strength properties should be determined in accordance with Section 8.

6. Design Considerations

6.1 *General Guidelines*—The design thickness of the CIPP is largely a function of the condition of the existing pipe. Design equations and details are given in Appendix X1.

7. Installation

7.1 *Cleaning and Inspection:*
7.1.1 Prior to entering access areas such as manholes, and performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen must be undertaken in accordance with local, state, or federal safety regulations.

7.1.2 *Cleaning of Pipeline*—All internal debris should be removed from the original pipeline. Gravity pipes should be cleaned with hydraulically powered equipment, high-velocity jet cleaners, or mechanically powered equipment (see NASSCO Recommended Specifications for Sewer Collection System Rehabilitation). Pressure pipelines should be cleaned with cable-attached devices or fluid-propelled devices as shown in AWWA Manual on Cleaning and Lining Water Mains, M 28.

7.1.3 *Inspection of Pipelines*—Inspection of pipelines should be performed by experienced personnel trained in locating breaks, obstacles, and service connections by closed-circuit television or man entry. The interior of the pipeline should be carefully inspected to determine the location of any conditions that may prevent proper installation of the impregnated tube, such as protruding service taps, collapsed or crushed pipe, and reductions in the cross-sectional area of more than 40 %. These conditions should be noted so that they can be corrected.

7.1.4 *Line Obstructions*—The original pipeline should be clear of obstructions such as solids, dropped joints, protruding service connections, crushed or collapsed pipe, and reductions in the cross-sectional area of more than 40 % that will prevent the insertion of the resin-impregnated tube. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction.

7.2 *Resin Impregnation*—The tube should be vacuum-impregnated with resin (wet-out) under controlled conditions. The volume of resin used should be sufficient to fill all voids in the tube material at nominal thickness and diameter. The volume should be adjusted by adding 5 to 10 % excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe.

7.3 *Bypassing*—If bypassing of the flow is required around the sections of pipe designated for reconstruction, the bypass should be made by plugging the line at a point upstream of the pipe to be reconstructed and pumping the flow to a downstream point or adjacent system. The pump and bypass lines should be of adequate capacity and size to handle the flow. Services within this reach will be temporarily out of service.

7.3.1 Public advisory services will be required to notify all parties whose service laterals will be out of commission and to advise against water usage until the mainline is back in service.

7.4 *Inversion:*

7.4.1 *Using Hydrostatic Head*—The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of a hydrostatic head sufficient to fully extend it to the next designated manhole or termination point. The tube should be inserted into the vertical inversion standpipe with the impermeable plastic membrane side out. At the lower end of the inversion standpipe, the tube should be turned inside out and attached to the standpipe so that a leakproof seal is created. The inversion head should be adjusted to be of sufficient height to

TABLE 1 CIPP Initial Structural Properties^A

Property	Test Method	Minimum Value	
		psi	(MPa)
Flexural strength	D790	4 500	(31)
Flexural modulus	D790	250 000	(1 724)
Tensile strength (for pressure pipes only)	D638	3 000	(21)

^AThe values in Table 1 are for field inspection. The purchaser should consult the manufacturer for the long-term structural properties.

cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections. Care should be taken during the inversion so as not to over-stress the felt fiber.

7.4.1.1 An alternative method of installation is a top inversion. In this case, the tube is attached to a top ring and is inverted to form a standpipe from the tube itself or another method accepted by the engineer.

NOTE 1—The tube manufacturer should provide information on the maximum allowable tensile stress for the tube.

7.4.2 *Using Air Pressure*—The wet-out tube should be inserted through an existing manhole or other approved access by means of an inversion process and the application of air pressure sufficient to fully extend it to the next designated manhole or termination point. The tube should be connected by an attachment at the upper end of the guide chute so that a leakproof seal is created and with the impermeable plastic membranes side out. As the tube enters the guide chute, the tube should be turned inside out. The inversion air pressure should be adjusted to be of sufficient pressure to cause the impregnated tube to invert from point of inversion to point of termination and hold the tube tight to the pipe wall, producing dimples at side connections. Care should be taken during the inversion so as not to overstress the woven and nonwoven materials. **Warning**—Suitable precautions should be taken to eliminate hazards to personnel in the proximity of the construction when pressurized air is being used.

7.4.3 *Required Pressures*—Before the inversion begins, the tube manufacturer shall provide the minimum pressure required to hold the tube tight against the existing conduit, and the maximum allowable pressure so as not to damage the tube. Once the inversion has started, the pressure shall be maintained between the minimum and maximum pressures until the inversion has been completed.

7.5 *Lubricant*—The use of a lubricant during inversion is recommended to reduce friction during inversion. This lubricant should be poured into the inversion water in the downtube or applied directly to the tube. The lubricant used should be a nontoxic, oil-based product that has no detrimental effects on the tube or boiler and pump system, will not support the growth of bacteria, and will not adversely affect the fluid to be transported.

7.6 *Curing:*

7.6.1 *Using Circulating Heated Water*—After inversion is completed, a suitable heat source and water recirculation equipment are required to circulate heated water throughout the pipe. The equipment should be capable of delivering hot water throughout the section to uniformly raise the water temperature above the temperature required to effect a cure of the resin. Water temperature in the line during the cure period should be as recommended by the resin manufacturer.

7.6.1.1 The heat source should be fitted with suitable monitors to gage the temperature of the incoming and outgoing water supply. Another such gage should be placed between the impregnated tube and the pipe invert at the termination to determine the temperatures during cure.

7.6.1.2 Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe

appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin. After initial cure is reached, the temperature should be raised to the post-cure temperature recommended by the resin manufacturer. The post-cure temperature should be held for a period as recommended by the resin manufacturer, during which time the recirculation of the water and cycling of the boiler to maintain the temperature continues. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).

7.6.2 *Using Steam*—After inversion is completed, suitable steam-generating equipment is required to distribute steam throughout the pipe. The equipment should be capable of delivering steam throughout the section to uniformly raise the temperature within the pipe above the temperature required to effect a cure of the resin. The temperature in the line during the cure period should be as recommended by the resin manufacturer.

7.6.2.1 The steam-generating equipment should be fitted with a suitable monitor to gage the temperature of the outgoing steam. The temperature of the resin being cured should be monitored by placing gages between the impregnated tube and the existing pipe at both ends to determine the temperature during cure.

7.6.2.2 Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin. After initial cure is reached, the temperature should be raised to post-cure temperatures recommended by the resin manufacturer. The post-cure temperature should be held for a period as recommended by the resin manufacturer, during which time the distribution and control of steam to maintain the temperature continues. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).

7.6.3 *Required Pressures*—As required by the purchase agreement, the estimated maximum and minimum pressure required to hold the flexible tube tight against the existing conduit during the curing process should be provided by the seller and shall be increased to include consideration of the external ground water, if present. Once the cure has started and dimpling for laterals is completed, the required pressures should be maintained until the cure has been completed. For water or steam, the pressure should be maintained within the estimated maximum and minimum pressure during the curing process. If the steam pressure or hydrostatic head drops below the recommended minimum during the cure, the CIPP should be inspected for lifts or delaminations and evaluated for its ability to fully meet the applicable requirements of 7.8 and Section 8.

7.7 *Cool-Down:*

7.7.1 *Using Cool Water After Heated Water Cure*—The new pipe should be cooled to a temperature below 100°F (38°C) before relieving the static head in the inversion standpipe. Cool-down may be accomplished by the introduction of cool

water into the inversion standpipe to replace water being drained from a small hole made in the downstream end. Care should be taken in the release of the static head so that a vacuum will not be developed that could damage the newly installed pipe.

7.7.2 Using Cool Water After Steam Cure—The new pipe should be cooled to a temperature below 113°F (45°C) before relieving the internal pressure within the section. Cool-down may be accomplished by the introduction of cool water into the section to replace the mixture of air and steam being drained from a small hole made in the downstream end. Care should be taken in the release of the air pressure so that a vacuum will not be developed that could damage the newly installed pipe.

7.8 Workmanship—The finished pipe should be continuous over the entire length of an inversion run and be free of dry spots, lifts, and delaminations. If these conditions are present, remove and replace the CIPP in these areas.

7.8.1 If the CIPP does not fit tightly against the original pipe at its termination point(s), the space between the pipes should be sealed by filling with a resin mixture compatible with the CIPP.

7.9 Service Connections—After the new pipe has been cured in place, the existing active service connections should be reconnected. This should generally be done without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a remote-control cutting device.

8. Inspection Practices

8.1 For each inversion length designated by the owner in the Contract documents or purchase order, the preparation of a CIPP sample is required, using one of the following two methods, depending on the size of the host pipe.

8.1.1 For pipe sizes of 18 in. or less, the sample should be cut from a section of cured CIPP at an intermediate manhole or at the termination point that has been inverted through a like diameter pipe which has been held in place by a suitable heat sink, such as sandbags.

8.1.2 In medium and large-diameter applications and areas with limited access, the sample should be fabricated from material taken from the tube and the resin/catalyst system used and cured in a clamped mold placed in the downtube when circulating heated water is used and in the silencer when steam is used. This method can also be used for sizes 18 in. or less, in situations where preparing samples in accordance with **8.1.1** can not be obtained due to physical constraints, if approved by the owner.

8.1.3 The samples for each of these cases should be large enough to provide a minimum of three specimens and a recommended five specimens for flexural testing and also for tensile testing, if applicable. The following test procedures should be followed after the sample is cured and removed.

8.1.3.1 Short-Term Flexural (Bending) Properties—The initial tangent flexural modulus of elasticity and flexural stress should be measured for gravity and pressure pipe applications in accordance with Test Methods **D790** and should meet the requirements of **Table 1**.

8.1.3.2 Tensile Properties—The tensile strength should be measured for pressure pipe applications in accordance with Test Method **D638** and must meet the requirements of **Table 1**.

8.2 Gravity Pipe Leakage Testing—If required by the owner in the contract documents or purchase order, gravity pipes should be tested using an exfiltration test method where the CIPP is plugged at both ends and filled with water. This test should take place after the CIPP has cooled down to ambient temperature. This test is limited to pipe lengths with no service laterals and diameters of 36 in. or less. The allowable water exfiltration for any length of pipe between termination points should not exceed 50 U.S. gallons per inch of internal pipe diameter per mile per day, providing that all air has been bled from the line. During exfiltration testing, the maximum internal pipe pressure at the lowest end should not exceed 10 ft (3.0 m) of water or 4.3 psi (29.7 kPa) and the water level inside of the inversion standpipe should be 2 ft (0.6 m) higher than the top of the pipe or 2 ft higher than the groundwater level, whichever is greater. The leakage quantity should be gaged by the water level in a temporary standpipe placed in the upstream plug. The test should be conducted for a minimum of one hour.

NOTE 2—It is impractical to test pipes above 36-in. diameter for leakage due to the technology available in the pipe rehabilitation industry. Post inspection of larger pipes will detect major leaks or blockages.

8.3 Pressure Pipe Testing—If required by the owner in the contract documents or purchase order, pressure pipes should be subjected to a hydrostatic pressure test. A recommended pressure and leakage test would be at twice the known working pressure or at the working pressure plus 50 psi, whichever is less. Hold this pressure for a period of two to three hours to allow for stabilization of the CIPP. After this period, the pressure test will begin for a minimum of one hour. The allowable leakage during the pressure test should be 20 U.S. gallons per inch of internal pipe diameter per mile per day, providing that all air has been evacuated from the line prior to testing and the CIPP has cooled down to ambient temperature.

NOTE 3—The allowable leakage for gravity and pressure pipe testing is a function of water loss at the end seals and trapped air in the pipe.

8.4 Delamination Test—If required by the owner in the contract documents or purchase order, a delamination test should be performed on each inversion length specified. The CIPP samples should be prepared in accordance with 8.1.2, except that a portion of the tube material in the sample should be dry and isolated from the resin in order to separate tube layers for testing. (Consult the tube manufacturer for further information.) Delamination testing shall be in accordance with Test Method **D903**, with the following exceptions:

8.4.1 The rate of travel of the power-actuated grip shall be 1 in. (25 mm)/min.

8.4.2 Five test specimens shall be tested for each inversion specified.

8.4.3 The thickness of the test specimen shall be minimized, but should be sufficient to adequately test delamination of nonhomogeneous CIPP layers.

8.5 The peel or stripping strength between any nonhomogeneous layers of the CIPP laminate should be a minimum of 10 lb/in. (178.60 g/mm) of width for typical CIPP applications.

NOTE 4—The purchaser may designate the dissimilar layers between which the delamination test will be conducted.

NOTE 5—For additional details on conducting the delamination test, contact the CIPP contractor.

8.6 CIPP Wall Thickness—The method of obtaining CIPP wall thickness measurements should be determined in a manner consistent with 8.1.2 of Specification **D5813**. Thickness measurements should be made in accordance with Practice **D3567** for samples prepared in accordance with **8.1**. Make a minimum of eight measurements at evenly spaced intervals around the circumference of the pipe to ensure that minimum and maximum thicknesses have been determined. Deduct from the measured values the thickness of any plastic coatings or CIPP layers not included in the structural design of the CIPP. The average thickness should be calculated using all measured values and shall meet or exceed minimum design thickness as agreed upon between purchaser and seller. The minimum wall thickness at any point shall not be less than 87.5% of the specified design thickness as agreed upon between purchase and seller.

8.6.1 Ultrasonic Testing of Wall Thickness—An alternative method to **8.6** for measuring the wall thickness may be performed within the installed CIPP at either end of the pipe by the ultrasonic pulse echo method as described in Practice **E797/E797M**. A minimum of eight (8) evenly spaced measure-

ments should be made around the internal circumference of the installed CIPP within the host pipe at a distance of 12 to 18 in. from the end of the pipe. For pipe diameters of fifteen (15) in. or greater, a minimum of sixteen (16) evenly spaced measurements shall be recorded. The ultrasonic method to be used is the flaw detector with A-scan display and direct thickness readout as defined in 6.1.2 of **E797/E797M**. A calibration block shall be manufactured from the identical materials used in the installed CIPP to calibrate sound velocity through the liner. Calibration of the transducer shall be performed daily in accordance with the equipment manufacturer's recommendations. The average thickness should be calculated using all measured values and shall meet or exceed minimum design thickness as agreed upon between purchaser and seller. The minimum wall thickness at any point shall not be less than 87.5 % of the specified design thickness as agreed upon between purchaser and seller.

8.7 Inspection and Acceptance—The installation may be inspected visually if appropriate, or by closed-circuit television if visual inspection cannot be accomplished. Variations from true line and grade may be inherent because of the conditions of the original piping. No infiltration of groundwater should be observed. All service entrances should be accounted for and be unobstructed.

APPENDIXES

(Nonmandatory Information)

X1. DESIGN CONSIDERATIONS

X1.1 Terminology:

X1.1.1 partially deteriorated pipe—the original pipe can support the soil and surcharge loads throughout the design life of the rehabilitated pipe. The soil adjacent to the existing pipe must provide adequate side support. The pipe may have longitudinal cracks and up to 10.0% distortion of the diameter. If the distortion of the diameter is greater than 10.0%, alternative design methods are required (see **Note 1**).

X1.1.2 fully deteriorated pipe—the original pipe is not structurally sound and cannot support soil and live loads or is expected to reach this condition over the design life of the rehabilitated pipe. This condition is evident when sections of the original pipe are missing, the pipe has lost its original shape, or the pipe has corroded due to the effects of the fluid, atmosphere, soil, or applied loads.

X1.2 Gravity Pipe:

X1.2.1 Partially Deteriorated Gravity Pipe Condition—The CIPP is designed to support the hydraulic loads due to groundwater, since the soil and surcharge loads can be supported by the original pipe. The groundwater level should be determined by the purchaser and the thickness of the CIPP should be sufficient to withstand this hydrostatic pressure without collapsing. The following equation may be used to determine the thickness required:

$$P = \frac{2KE_L}{(1 - \nu^2)} \cdot \frac{1}{(DR - 1)^3} \cdot \frac{C}{N} \quad (\text{X1.1})$$

where:

- P = groundwater load, psi (MPa), measured from the invert of the pipe
- K = enhancement factor of the soil and existing pipe adjacent to the new pipe (a minimum value of 7.0 is recommended where there is full support of the existing pipe),
- E_L = long-term (time corrected) modulus of elasticity for CIPP, psi (MPa) (see **Note X1.1**),
- ν = Poisson's ratio (0.3 average),
- DR = dimension ratio of CIPP,
- C = ovality reduction factor =

$$\left(\left[1 - \frac{\Delta}{100} \right] / \left[1 + \frac{\Delta}{100} \right] \right)^2 \cdot 3$$

Δ = percentage ovality of original pipe equals

$$100 \times \frac{(\text{Mean Inside Diameter} - \text{Minimum Inside Diameter})}{\text{Mean Inside Diameter}}$$

or

$$100 \times \frac{(\text{Maximum Inside Diameter} - \text{Mean Inside Diameter})}{\text{Mean Inside Diameter}}$$

and

N = factor of safety.

NOTE X1.1—The choice of value (from manufacturer’s literature) of E_L will depend on the estimated duration of the application of the load, P , in relation to the design life of the structure. For example, if the total duration of the load, P , is estimated to be 50 years, either continuously applied, or the sum of intermittent periods of loading, the appropriately conservative choice of value for E_L will be that given for 50 years of continuous loading at the maximum ground or fluid temperature expected to be reached over the life of the structure.

NOTE X1.2—If there is no groundwater above the pipe invert, the CIPP should typically have a maximum SDR of 100, dependent upon design conditions.

X1.2.1.1 If the original pipe is oval, the CIPP design from Eq X1.1 shall have a minimum thickness as calculated by the following formula:

$$1.5 \frac{\Delta}{100} \left(1 + \frac{\Delta}{100} \right) DR^2 - 0.5 \left(1 + \frac{\Delta}{100} \right) DR = \frac{\sigma_L}{PN} \tag{X1.2}$$

where:

σ_L = long-term (time corrected) flexural strength for CIPP, psi (MPa) (see Note X1.5).

X1.2.1.2 See Table X1.1 for typical design calculations.

X1.2.2 *Fully Deteriorated Gravity Pipe Condition*—The CIPP is designed to support hydraulic, soil, and live loads. The groundwater level, soil type and depth, and live load should be determined by the purchaser, and the following equation should be used to calculate the CIPP thickness required to withstand these loads without collapsing:

$$q_t = \frac{1}{N} \left[32 R_w B' E'_s \cdot C (E_L I / D^3) \right]^{1/2} \tag{X1.3}$$

TABLE X1.1 Maximum Groundwater Loads for Partially Deteriorated Gravity Pipe Condition				
Diameter, in. (Inside Diameter of Original Pipe)	Nominal CIPP Thickness, mm	CIPP Thickness, t , in.	Maximum Allowable Ground- water Load ^A (above invert)	
			ft	m
8	6	0.236	40.0	12.2
10	6	0.236	20.1	6.1
12	6	0.236	11.5	3.5
15	9	0.354	20.1	6.1
18	9	0.354	11.5	3.5
18	12	0.472	27.8	8.5
24	12	0.472	11.5	3.5
24	15	0.591	22.8	6.9
30	15	0.591	11.5	3.5
30	18	0.709	20.1	6.1

^AAssumes $K = 7.0$, $E = 125\,000$ psi (862 MPa) (50-year strength), $\nu = 0.30$, $C = 0.64$ (5 % ovality), and $N = 2.0$

where:

- q_t = total external pressure on pipe, psi (MPa),
= $0.433H_w + wHR_w/144 + W_s$, (English Units),
= $0.00981H_w + wHR_w/1000 + W_s$, (Metric Units)
- R_w = water buoyancy factor (0.67 min) = $1 - 0.33 (H_w/H)$,
- w = soil density, lb.ft³ (KN/m³),
- W_s = live load, psi (Mpa),
- H_w = height of water above top of pipe, ft (m)
- H = height of soil above top of pipe, ft (m),
- B' = coefficient of elastic support = $1/(1 + 4e^{-0.065H})$ inch-pound units, $(1/(1 + 4e^{-0.213H}))$ SI units
- I = moment of inertia of CIPP, in.⁴/in. (mm⁴/mm) = $t^3/12$,
- t = thickness of CIPP, in. (mm),
- C = ovality reduction factor (see X1.2.1),
- N = factor of safety,
- E'_s = modulus of soil reaction, psi (MPa) (see Note X1.4),
- E_L = long-term modulus of elasticity for CIPP, psi (MPa), and
- D = mean inside diameter of original pipe, in. (mm)

X1.2.2.1 The CIPP design from Eq X1.3 should have a minimum thickness as calculated by the following formula:

$$\frac{EI}{D^3} = \frac{E}{12(DR)^3} \geq 0.093 \text{ (inch - pound units)}, \tag{X1.4}$$

or

$$\frac{E}{12(DR)^3} \geq 0.00064 \text{ (SI units)}$$

where:

E = initial modulus of elasticity, psi (MPa)

NOTE X1.3—For pipelines at depth not subject to construction disturbance, or if the pipeline was originally installed using tunneling method, the soil load may be calculated using a tunnel load analysis. Finite element analysis is an alternative design method for noncircular pipes.

NOTE X1.4—For definition of modulus of soil reaction, see Practice D3839.

X1.2.2.2 The minimum CIPP design thickness for a fully deteriorated condition should also meet the requirements of Eq X1.1 and X1.2.

X1.3 *Pressure Pipe:*

X1.3.1 *Partially Deteriorated Pressure Condition*—A CIPP installed in an existing underground pipe is designed to support external hydrostatic loads due to groundwater as well as withstand the internal pressure in spanning across any holes in the original pipe wall. The results of Eq X1.1 are compared to those from Eq X1.6 or Eq X1.7, as directed by Eq X1.5, and the largest of the thicknesses is selected. In an above-ground design condition, the CIPP is designed to withstand the internal pressure only by using Eq X1.5-X1.7 as applicable.

X1.3.1.1 If the ratio of the hole in the original pipe wall to the pipe diameter does not exceed the quantity shown in **Eq X1.5**, then the CIPP is assumed to be a circular flat plate fixed at the edge and subjected to transverse pressure only. In this case, **Eq X1.6** is used for design. For holes larger than the d/D value in **Eq X1.5**, the liner cannot be considered in flat plate loading, but rather in ring tension or hoop stress, and **Eq X1.7** is used.

$$\frac{d}{D} \leq 1.83 \left(\frac{t}{D} \right)^{1/2} \quad (\text{X1.5})$$

where:

d = diameter of hole or opening in original pipe wall, in. (mm),
 D = mean inside diameter of original pipe, in. (mm), and
 t = thickness of CIPP, in. (mm).

$$P = \frac{5.33}{(DR - 1)^2} \left(\frac{D}{d} \right)^2 \frac{\sigma_L}{N} \quad (\text{X1.6})$$

where:

DR = dimension ratio of CIPP,
 D = mean inside diameter of original pipe, in. (mm),
 d = diameter of hole or opening in original pipe wall, in. (mm),
 σ_L = long-term (time corrected) flexural strength for CIPP, psi (MPa) (see **Note X1.5**), and
 N = factor of safety.

NOTE X1.5—The choice of value (from manufacturer's literature) of σ_L will depend on the estimated duration of the application of the load, P , in relation to the design life of the structure. For example, if the total duration of the load, P , is estimated to be 50 years, either continuously applied, or the sum of intermittent periods of loading, the appropriately conservative choice of value of σ_L will be that given for 50 years of continuous loading

at the maximum ground or fluid temperature expected to be reached over the life of the structure.

X1.3.2 *Fully Deteriorated Pressure Pipe Condition*—A CIPP to be installed in an underground condition is designed to withstand all external loads and the full internal pressure. The design thicknesses are calculated from **Eq X1.1**, **Eq X1.3**, **Eq X1.4**, and **Eq X1.7**, and the largest thickness is selected. If the pipe is above ground, the CIPP is designed to withstand internal pressure only by using **Eq X1.7**.

$$P = \frac{2\sigma_{TL}}{(DR - 2)N} \quad (\text{X1.7})$$

where:

P = internal pressure, psi (MPa),
 σ_{TL} = long-term (time corrected) tensile strength for CIPP, psi (MPa) (see **Note 12**),
 DR = dimension ratio of CIPP, and
 N = factor of safety.

NOTE X1.6—The choice of value (from manufacturer's literature) of σ_{TL} will depend on the estimated duration of the application of the load, P , in relation to the design life of the structure. For example, if the total duration of the load, P , is estimated to be 50 years, either continuously applied, or the sum of intermittent periods of loading, the appropriately conservative choice of value of σ_{TL} will be that given for 50 years of continuous loading at the maximum ground or fluid temperature expected to be reached over the life of the structure.

X1.4 *Negative Pressure*—Where the pipe is subject to a vacuum, the CIPP should be designed as a gravity pipe with the external hydrostatic pressure increased by an amount equal to the negative pressure.

NOTE X1.7—**Table X1.1** presents maximum groundwater loads for partially deteriorated pipes for selected typical nominal pipe sizes. CIPP is custom made to fit the original pipe and can be fabricated to a variety of sizes from 2 to 108-in. diameter which would be impractical to list here.

X2. CHEMICAL-RESISTANCE TESTS

X2.1 Scope:

X2.1.1 This appendix covers the test procedures for chemical-resistance properties of CIPP. Minimum standards are presented for standard domestic sewer applications.

X2.2 Procedure for Chemical-Resistance Testing:

X2.2.1 Chemical resistance tests should be completed in accordance with Practices **D543**. Exposure should be for a minimum of one month at 73.4°F (23°C). During this period, the CIPP test specimens should lose no more than 20 % of their initial flexural strength and flexural modulus when tested in accordance with Section 8 of this practice.

X2.2.2 **Table X2.1** presents a list of chemical solutions that serve as a recommended minimum requirement for the chemical-resistant properties of CIPP in standard domestic sanitary sewer applications.

X2.2.3 For applications other than standard domestic sewage, it is recommended that chemical-resistance tests be conducted with actual samples of the fluid flowing in the pipe. These tests can also be accomplished by depositing CIPP test specimens in the active pipe.



F1216 – 16

TABLE X2.1 Minimum Chemical Resistance Requirements for Domestic Sanitary Sewer Applications

Chemical Solution	Concentration, %
Tap water (pH 6–9)	100
Nitric acid	5
Phosphoric acid	10
Sulfuric acid	10
Gasoline	100
Vegetable oil	100
Detergent	0.1
Soap	0.1

SUMMARY OF CHANGES

Committee F17 has identified the location of selected changes to this standard since the last issue (F1217–09) that may impact the use of this standard.

(1) Revised **1.1** and **Note X1.7** to include pipe diameter sizes 2-in. to 108-in.

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a Marsh & McLennan Agency LLC company

January 22, 2020

Re: Insituform Technologies, LLC

**Insurance, Benefits
& Risk Management**

Suite 200
825 Maryville Centre Drive
St. Louis, MO 63017

314-594-2700

www.jwterrill.com

To Whom It May Concern:

Insituform Technologies, LLC is a valued Travelers Casualty and Surety Company of America surety customer. Travelers Casualty and Surety Company of America is one of the most financially sound insurance companies in the United States and enjoys a Best Rating of A++ with financial strength category of XV.

Due to Insituform Technologies, LLC's reputation, technical expertise, financial strength, quality equipment and experienced labor force, J.W. Terrill is prepared to consider performance and payment bonds for single jobs in the \$250,000,000 range with an aggregate work program of \$700,000,000.

Should a project be awarded to and accepted by Insituform Technologies, LLC, we are prepared to consider providing the required bonds on their behalf. Any bonds are subject to acceptable review of the contract terms and conditions, bond forms, confirmation of financing, and any other underwriting considerations at the time of the request. It should be understood that any arrangement for bonds is strictly a matter between Insituform Technologies, LLC and Travelers Casualty and Surety Company of America. We assume no liability to third parties or to you if for any reason we do not execute said bonds.

Please feel free to contact me if you have any specific questions regarding Insituform Technologies, LLC or their surety bond program.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew P. Thome".

Andrew P. Thome
President

State of Florida

Department of State

I certify from the records of this office that INSITUFORM TECHNOLOGIES, LLC is a Delaware limited liability company authorized to transact business in the State of Florida, qualified on January 18, 2012.

The document number of this limited liability company is M12000000304.

I further certify that said limited liability company has paid all fees due this office through December 31, 2019, that its most recent annual report was filed on March 26, 2019, and that its status is active.

I further certify that said limited liability company has not filed a Certificate of Withdrawal.

*Given under my hand and the
Great Seal of the State of Florida
at Tallahassee, the Capital, this
the Twenty-ninth day of April,
2019*



Randy B. Levine
Secretary of State

Tracking Number: 3957056520CU

To authenticate this certificate, visit the following site, enter this number, and then follow the instructions displayed.

<https://services.sunbiz.org/Filings/CertificateOfStatus/CertificateAuthentication>



FLORIDA DEPARTMENT OF STATE
Division of Corporations

January 18, 2012

BECKY PEIRCE
CSC
TALLAHASSEE, FL

Qualification documents for INSITUFORM TECHNOLOGIES, LLC were filed on January 18, 2012, and assigned document number M12000000304. Please refer to this number whenever corresponding with this office.

Your limited liability company is authorized to transact business in Florida as of the file date.

To maintain "active" status with the Division of Corporations, an annual report must be filed yearly between January 1st and May 1st beginning in the year following the file date or effective date indicated above. If the annual report is not filed by May 1st, a \$400 late fee will be added.

A Federal Employer Identification Number (FEI/EIN) will be required when this report is filed. Contact the IRS at 1-800-829-4933 for an SS-4 form or go to www.irs.gov.

Please notify this office if the limited liability company address changes.

Should you have any questions regarding this matter, please contact this office at the address given below.

Buck Kohr
Regulatory Specialist II
Registration/Qualification Section
Division of Corporations

Letter Number: 712A00001262

Account number: I20000000195

Amount charged: 125.00

www.sunbiz.org

Division of Corporations - P.O. BOX 6327 - Tallahassee, Florida 32314

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12 JAN 18 PM 3:50

APPLICATION BY FOREIGN LIMITED LIABILITY COMPANY FOR AUTHORIZATION TO
TRANSACTION BUSINESS IN FLORIDA

IN COMPLIANCE WITH SECTION 608.503, FLORIDA STATUTES, THE FOLLOWING IS SUBMITTED TO REGISTER A FOREIGN
LIMITED LIABILITY COMPANY TO TRANSACTION BUSINESS IN THE STATE OF FLORIDA:

1. INSTRUFORM TECHNOLOGIES, LLC
(Name of Foreign Limited Liability Company; must include "Limited Liability Company," "LLC," or "LLC.")

(If name unavailable, enter alternate name adopted for the purpose of transacting business in Florida and attach a copy of the written consent of the managers or managing members adopting the alternate name. The alternate name must include "Limited Liability Company," "LLC," "LLC.")

2. DE 3. _____
(Jurisdiction under the law of which foreign limited liability company is organized) (FBI number, if applicable)

4. 03/27/1980 5. Perpetual
(Date of Organization) (Duration: Year limited liability company will cease to exist or "perpetual")

6. Upon Filing
(Date first transacted business in Florida, if prior to registration.)
(See sections 608.501 & 608.502 F.S. to determine penalty liability)

7. 17988 Edison Ave. Chesterfield MO 63005
(Street Address of Principal Office)

8. If limited liability company is a manager-managed company, check here ☒

9. The name and usual business addresses of the managing members or managers are as follows:

Joe Burgess 17988 Edison Ave. Chesterfield MO 63005

David Martin 17988 Edison Ave. Chesterfield MO 63005

David F. Morris 17988 Edison Ave. Chesterfield MO 63005

10. Attached is an original certificate of existence, no more than 90 days old, duly authenticated by the official having custody of records in the jurisdiction under the law of which it is organized. (A photocopy is not acceptable. If the certificate is in a foreign language, a translation of the certificate under oath of the translator must be submitted)

11. Nature of business or purposes to be conducted or promoted in Florida: _____
Any lawful business, purpose or activity.

[Signature]
Signature of a member or an authorized representative of a member.

(In accordance with section 608.408(3), F.S., the execution of this document constitutes an affirmation under the penalties of perjury that the facts stated herein are true. I am aware that any false information submitted in a document to the Department of State constitutes a third degree felony as provided for in s.817.153, F.S.)

David F. Morris, Manager

Typed or printed name of signer

**CERTIFICATE OF DESIGNATION OF
REGISTERED AGENT/REGISTERED OFFICE**

PURSUANT TO THE PROVISIONS OF SECTION 608.415 or 608.507, FLORIDA STATUTES, THE
UNDERSIGNED LIMITED LIABILITY COMPANY SUBMITS THE FOLLOWING STATEMENT
TO DESIGNATE A REGISTERED OFFICE AND REGISTERED AGENT IN THE STATE OF
FLORIDA.

1. The name of the Limited Liability Company is:

Insitiform Technologies, LLC

If unavailable, the alternate to be used in the state of Florida is:

2. The name and the Florida street address of the registered agent and office are:

Corporation Service Company

(Name)

1201 Hays Street

Florida Street Address (P.O. Box NOT ACCEPTABLE)

Tallahassee

FL 32301

City/State/Zip

Having been named as registered agent and to accept service of process for the above stated limited liability company at the place designated in this certificate, I hereby accept the appointment as registered agent and agree to act in this capacity. I further agree to comply with the provisions of all statutes relating to the proper and complete performance of my duties, and I am familiar with and accept the obligations of my position as registered agent as provided for in Chapter 608, Florida Statutes.

Corporation Service Company

By: 

(Signature)

Dawn Frantz, Assistant Secretary

\$ 100.00 Filing Fee for Application
\$ 25.00 Designation of Registered Agent
\$ 30.00 Certified Copy (optional)
\$ 5.00 Certificate of Status (optional)

Delaware

PAGE 1

The First State

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "INSITUFORM TECHNOLOGIES, LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE SEVENTEENTH DAY OF JANUARY, A.D. 2012.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "INSITUFORM TECHNOLOGIES, LLC" WAS FORMED ON THE TWENTY-SEVENTH DAY OF MARCH, A.D. 1980.

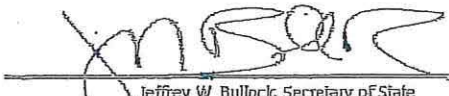
AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE BEEN PAID TO DATE.



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Jeffrey W. Bullock, Secretary of State
AUTHENTICATION: 9301204

DATE: 01-17-12

Independent Test Results

Product tested:

Cured-In-Place Pipe Insituform® Process

Test:

Design Life

Conducted by:

Trenchless Technology Center at Louisiana Tech University; funded by U.S. Army Corps of Engineers

Report Date:

August 1994

INNOVATIVE METHODS OF TESTING the long-term structural behavior of Cured-In-Place Pipe (CIPP) demonstrates that the Insituform product design life exceeds 50 years and that ASTM F-1216 design recommendations for physical properties are conservative for the Insituform product.

The research was conducted by the Trenchless Technology Center (TTC) at Louisiana Tech University and funded by the U.S. Army Corps of Engineers. The purpose was to provide, for the first time, an independent assessment of manufacturer's claims regarding long-term buckling behavior of their pipeline rehabilitation products.

Research conducted by the Trenchless Technology Center at Louisiana Tech University confirms Insituform's 50-year design life.

The expected design life and long-term behavior of trenchless pipeline rehabilitation products is important to owners and engineers in evaluating the various systems available in the marketplace, especially since none of these systems have been in actual service for the design lives claimed. This becomes even more critical considering the recent growth of the trenchless pipeline rehabilitation industry and that many products have less than five years of experience.

The research included both experimental and analytical studies related to the application of CIPP and Fold-and-Formed Pipe (FFP) technologies in partially deteriorated, gravity pipeline applications where bonding did not exist between the plastic pipe and the host pipe.

Five manufacturers participated in the test program. Seven different products, including six CIPP products and one FFP product, were evaluated in approximately 200 tests. Insituform products that were tested included Insituform® Standard, which is a widely used polyester resin Insitupipe® material, and Insituform® Enhanced, which contains an additive to the polyester resin to increase the flexural properties of the finished Insituform product.

The plastic pipes were encased in steel pipes, with hydrostatic pressure applied between the two pipes. To measure long-term performance, each test remained under constant pressures for up to 10,000 hours or until failure, whichever occurred first. The test results were plotted and extrapolated beyond the test period to estimate behavior up to 50 years.

Standardized material tests (flexure, tensile and pipe stiffness tests) were also conducted to characterize the fundamental properties of the product materials.

PUTTING CLAIMS TO THE TEST

Overview of Test System and Procedures

The installation of all products used in the test was performed by the manufacturers on the Louisiana Tech University campus under close monitoring by TTC personnel. Forty specimens each of Insituform

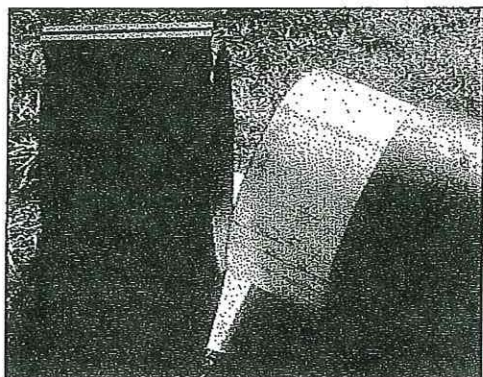


Figure 1

Standard and Insituform Enhanced were tested. Each test specimen was installed to fit snugly inside a 1.83 m (6 ft.) long, 305 mm (12 in.) internal diameter, schedule 40 steel casing pipe. Each casing pipe was fitted with short, bolted pipe segments (clamshells) at each end. (See Figure 1).

Preparing the specimens for testing involved trimming the ends flush with the clamshells, removing the clamshells, and cleaning the ends of the specimens. This resulted in the plastic pipe extending beyond the ends of the steel casing pipes. The specimens were then fitted with end seals applied externally, spanning the casing pipe and plastic pipe. (See Figure 2). The end seals contained the water at the prescribed pressure, which was

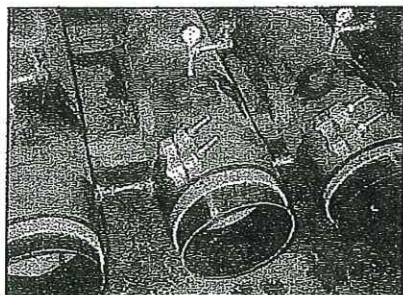


Figure 2

supplied between the plastic and casing pipes from a pressurized water distribution system.

At least three specimens of each product were used for short-term buckling tests to determine the upper pressure limit for the long-term tests. A regulator was used to raise the pressure on the specimen, and the rate of load application was kept constant until failure occurred.

For the long-term tests, each specimen was pressurized at a controlled rate of 10 psi/minute (69 kPa/minute) until a selected pressure was reached. A minimum of five pressure levels were selected for each product to cause the specimens to fail at various times over a 10,000-hour test period.

Specimens were monitored at least once a day for evidence of buckling. Failures that occurred during normal work hours were monitored manually. After normal work hours, failures were detected electronically.

Material Characterization Tests

Numerous tests, including flexural modulus, flexural strength and tensile strength, were conducted on each product according to ASTM standards. On each of these tests, the results found that both Insituform products far surpassed the design values.

(See Table 1).

Table 1

Material Characterization Tests (Short-term)

PHYSICAL PROPERTY	INSITUFORM PRODUCT	ASTM TEST METHOD	MANUFACTURER'S DESIGN VALUE psi (MPa)	TTC TEST RESULTS psi (MPa)
Flexural Modulus	Standard	D790	300,000 (2070)	448,630 (3090)
	Enhanced	D790	400,000 (2760)	538,620 (3710)
Flexural Strength	Standard	D790	4,500 (31)	9,310 (64)
	Enhanced	D790	4,000 (28)	8,400 (58)

From TTC Technical Report #302, Table 4-2

SHORT-TERM TEST RESULTS

Short-term buckling tests demonstrate that Insituform design is conservative in terms of both the enhancement factor, K, and the predicted buckling pressures using the following ASTM F-1216 design model:

$$P = \frac{2KE_L}{(1-\nu^2)} \cdot \frac{1}{(DR-1)^3} \cdot \frac{C}{N} \quad (1)$$

where, P = Buckling pressure, psi (MPa)

K = Enhancement factor

E_L = Long-term (time-corrected) modulus of elasticity, psi (MPa)

ν = Poisson's ratio

DR = Dimension ratio (outside diameter divided by thickness)

C = Ovality factor = 1 (for test program)

N = Safety factor = 1 (for analysis of test data)

The enhancement factor, K, is a measure of the restraining action of the host pipe that encases the Insituform product and greatly increases the allowable external buckling pressure. A conservative enhancement factor of 7 is typically recommended for design. The tests measured the average enhancement factor, K, of the Insituform Standard at 9.8 and the Insituform Enhanced product at 10.5.

CREEP FACTOR

Creep factor reflects the reduction in buckling resistance of a plastic pipe over time, typically 50 years. The creep factor, C_L , is the ratio of Experimental E_L to the measured flexural modulus reported in Table 1 and represents the retention of buckling resistance at 50 years (i.e., $E_L = C_L E$). A value of C_L greater than the manufacturer's recommended value is desirable. As shown in Table 2, the reported creep factor confirms the conservative nature of the 50% creep reduction factor applied to flexural modulus in the Insituform product design.

Table 2
Creep Factor

	TTC Creep Factor, C_L	Manufacturer's Recommended Design Value
Insituform Standard	0.58 (42% reduction)	0.50 (50% reduction)
Insituform Enhanced	0.73 (27% reduction)	0.50 (50% reduction)

From TTC Technical Report #302, Table 4-8

LONG-TERM TEST RESULTS

Regression analysis was used to extrapolate long-term buckling pressures beyond the 10,000-hour test period to 50 years. (See Figure 3, next page).

Flexural Modulus

Test results supported the flexural modulus reduced to account for long-term effects, E_L , used in the Insituform product design, by comparing it to the experimentally derived apparent long-term flexural modulus for a 50-year design life. The tested value greatly exceeded the conservative value used in the Insituform product design. (See Table 3).

Table 3
Flexural Modulus (Long-term)

	TTC Experimental E_L psi (MPa)	Manufacturer's Recommended Design E_L psi (MPa)
Insituform Standard	259,990 (1790)	150,000 (1030)
Insituform Enhanced	393,965 (2720)	200,000 (1380)

From TTC Technical Report #302, Table 4-8

LONG-TERM BUCKLING BEHAVIOR

It is important that the design procedures used for a rehabilitation product accurately predict the long-term structural behavior of the product. The TTC data analysis compared the long-term buckling test data to that predicted by Equation 1. This comparison indicated that Equation 1 conservatively predicts long-term hydrostatic buckling behavior of both Insituform products.

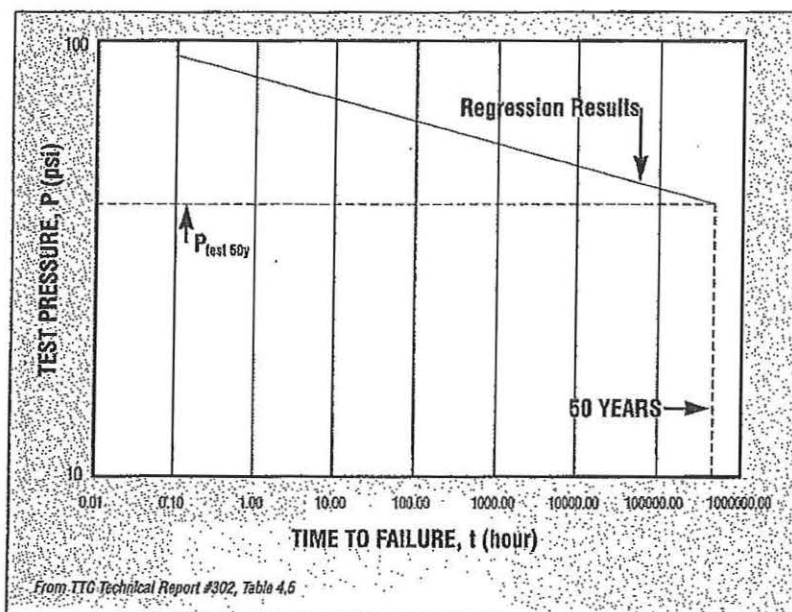


Figure 3. Long-term Test and Regression Results for Insituform Enhanced Product.

50 - PLUS YEARS DESIGN LIFE

One of the primary goals of the TTC test program was to evaluate the design lives of various rehabilitation products. This was accomplished by comparing the 50-year extrapolated test pressure to the design 50-year buckling pressure calculated using Equation 1 with manufacturer's recommended design values for E_L . An Insituform design life in excess of 50 years was confirmed.

WITHSTANDING THE TESTS OF TIME

The most rigorous, innovative and independent tests ever conducted on pipeline rehabilitation products clearly demonstrates that service life beyond 50 years can be expected with properly designed and installed Insituform products.

A copy of "Long-Term Structural Behavior of Pipeline Rehabilitation Systems" (TTC Technical Report #302) may be obtained by writing:

Trenchless Technology Center
Louisiana Tech University
P.O. Box 10348
Ruston, Louisiana 71272

or by calling (318) 257-4072.



**Insituform
Technologies, Inc.**

Worldwide Pipeline Rehabilitation

702 Spirit 40 Park Drive
Chesterfield, MO 63005
Toll Free: 800-234-2992
Phone: 636-530-8000
Fax: 636-519-8010

An Insituform® cured-in-place pipe (CIPP) continues to exceed industry performance standards after 30 years in service.

Independent Test Results

Product tested:

Insituform® Cured-In-Place Pipe (CIPP)

Test:

Flexural Properties

Conducted by:

Bodycote Materials Testing Ltd.

Report Date:

November 2001

SUMMARY OF RESULTS

- After 30 years of service in a London sewer carrying both domestic and industrial effluent, an Insituform® CIPP was found to have a flexural modulus exceeding the nearest contemporary UK Water Industry Specification by 50%, and the current US standard by more than 90%.
- The 30-year-old pipe's flexural modulus was an improvement over test data obtained after 20 years in service.
- There was no apparent deterioration in the overall performance of the Insituform® CIPP between its 20th and 30th year in service.

INTRODUCTION

In October 2001, tests were conducted by Bodycote Materials Testing Ltd. to determine the flexural properties of the samples taken from an Insituform® CIPP that had been in service for 30 years.

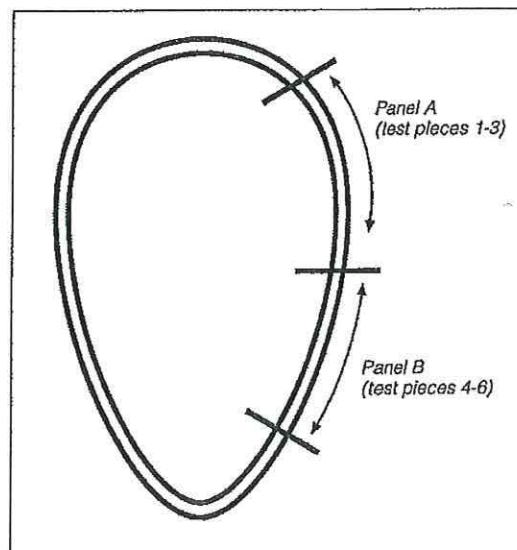
The pipe samples were taken from a 1,170 mm X 600 mm (46 in. X 24 in.) egg-shaped sewer at Riverside Close in Hackney, London. This is the same Insituform® CIPP that was sampled and tested in 1991; after 20 years in service, by Bodycote's predecessor MTS Pendar Ltd.

Supervising removal of the samples were representatives from both Bodycote and the sewer Owner, Thames Water Utilities Limited.

PROCEDURE

Two panels, approximately 300 mm (12 in.) square, were taken from a side wall of the sewer, approximately four meters downstream from a manhole. Three test pieces were cut from each panel as shown in the diagram below.

The flexural properties of each test piece were determined by the method of BS EN ISO 178, in accordance with current UK Water Industry Specification (WIS) 4-34-04.

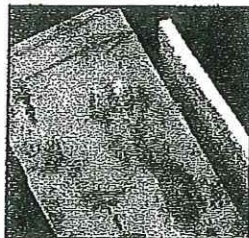


RESULTS AND CONCLUSIONS

After 30 years in service, the Insituform® CIPP continues to exceed industry performance

standards, and further, the pipe showed no significant deterioration in overall performance between its 20th and 30th years of service.

Table 1
30-Year Test Results



View of inside face of sample panel and a test piece cut from it.

Sample	Flexural Modulus	Flexural Strength
Panel A	3,100 MPa 450,000 psi	39 MPa 5,700 psi
Panel B	3,500 MPa 500,000 psi	47 MPa 6,800 psi
Mean	3,300 MPa 480,000 psi	43 MPa 6,200 psi

Table 2
Comparison of Mean Flexural Properties After 30 and 20 Years of Service

Flexural Property	Samples		Industry Standards	
	30-year	20-year	WIS 4-34-04	ASTM F 1216
Modulus				
MPa	3,300	2,900	2,200*	—
psi	480,000	420,000	—	250,000
Strength				
MPa	43	46	25	—
psi	6,200	6,700	—	4,500

* As specified in Issue 1 of the WIS. Issue 2 refers to declared values but does not specify a minimum flexural modulus.

REFERENCES:

1. WIS 4-34-04 April 1986: Issue 1, "Specification for Polyester Insituform Sewer Linings."
2. WIS 4-34-04 March 1995: Issue 2, "Specification for Renovation of Gravity Sewers by Lining with Cured-in-Place Pipes."
3. BS EN ISO 178: 1996, "Plastics-Determination of Flexural Properties."
4. ASTM F 1216, "Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube."
5. MTS Pendar Report 46204, September 19, 1991 (20-year test)
6. Bodycote Report B110254, November 15, 2001 (30-year test)



**Insituform
Technologies, Inc.**

Worldwide Pipeline Rehabilitation

702 Spirit 40 Park Drive
Chesterfield, MO 63005

Toll Free: 800-234-2992
Phone: 636-530-8000
Fax: 636-519-8010



AB1307
5/02

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Specialty Testing Services

Specialty Testing Services
3171 Green Valley Rd. #451
Birmingham, Al. 35243

Phone: 205-281-2349
Fax: 205-661-2992
Email: jwoodsiss@aol.com

Statement of Qualifications

Sewer Rehabilitation Material Testing

Company Information

Specialty Testing Services was created in 2000, originally under the company name of Industrial Specialty Services, to provide materials testing to an industrial client base. In 2005 the name was changed to reflect the specific nature that the company has taken. Having moved away from industrial testing and specializing in in-house laboratory testing of sewer rehabilitation materials, Specialty Testing has emerged as a leader in the industry. Located in Birmingham, Alabama the company is owned and operated by Johnny Woods.

Experience

The owner of Specialty Testing, Johnny Woods has over 15 years experience in the direct supervision of laboratory testing personnel and procedures. Since its inception Specialty Testing has performed testing on over 5000 samples of sewer rehabilitation material.

Projects

Specialty Testing Services currently provides on going materials testing for the following projects:

- Jefferson County, Alabama Sewer Rehabilitation
 - City of Atlanta, Georgia Sewer Rehabilitation- Insituform Technologies, Inc.
 - Knoxville Utilities Board Sewer Rehabilitation
 - Gwinnett County, Georgia - Reynolds Inliner, Inc.
-

Specialty Testing Services

Specialty Testing Services
3171 Green Valley Rd. #451
Birmingham, Al. 35243

Phone: 205-281-2349
Fax: 205-661-2992
Email: jcwoods1ss@aol.com

Sewer Rehabilitation Material Testing

Services

Specialty Testing Services routinely provides material testing for both the manhole rehabilitation and the cast-in-place (CIP) sewer rehabilitation industry. Tests normally performed include the following:

- Tensile Test – ASTM D638
- Flexural Test – ASTM D790

Testing can be performed for the end user as a quality assurance function or for the product installer as a quality control function.

Schedule

Material samples are normally prepared by the contracted installer. Samples are sent to Specialty Testing facility in Birmingham, Alabama at predetermined intervals. Specialty Testing usually requires 1-2 weeks for test completion. Emergency testing services can be negotiated with results transmitted in as little as 24 hours.

Reporting

Test reports are computer generated providing the data specified by the ASTM standard. Reports may be provided in hard copy format or in digital format for electronic transmission.

Specialty Testing Services

Specialty Testing Services
3171 Green Valley Rd. #451
Birmingham, Al. 35243

Phone: 205-281-2349
Fax: 205-661-2992
Email: jcwoodsiss@aol.com

Sewer Rehabilitation Material Testing

Major Project Details

- **Client:** Jefferson County Environmental Services
Project Manager: US Infrastructure, Inc.
Contact: Mr. John Willett **Phone:** 205-945-0098
Project Name: Valley Creek Water Shed Materials Testing
Project Description: Materials testing for CIPP sewer rehab and manhole rehab material.
Description of Work: Flexural and Tensile test on approximately 750 samples.
- **Client:** Jefferson County Environmental Services
Project Manager: US Infrastructure, Inc.
Contact: Mr. John Willett **Phone:** 205-945-0098
Project Name: Shades Creek Water Shed Materials Testing
Project Description: Materials testing for CIPP sewer rehab and manhole rehab material.
Description of Work: Flexural and Tensile test on approximately 300 samples
- **Client:** Insituform Technologies, Inc.
Contact: Mr. John Sloan **Phone:** 770-640-3337
Project Name: City Of Atlanta
Project Description: Third party testing services for CIPP installation
Description of Work: To date Specialty Testing has performed over 2500 flexural test of CIPP samples.
- **Client:** W.L. Hailey & Company
Contact: Mr. David Ward **Phone:** 865-938-7192
Project Name: Knoxville Utilities Board
Project Description: Third party testing services for CIPP installation
Description of Work: To Provide ongoing flexural testing of CIPP samples.



Insituform *Worldwide Pipeline
Rehabilitation*
Technologies, LLC

17988 Edison Avenue
Chesterfield, MO 63005
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Mark M. Favazza
Senior Counsel
Phone: 636-530-8794
Fax: 636-898-5158
E-mail: mfavazza@aegion.com

January 1, 2020

LETTER FOR RECORD

To Whom It May Concern:

Insituform Technologies, LLC ("IT") is a subsidiary of Aegion Corporation ("Aegion") a \$1 billion revenue, international, publicly traded (NASDAQ-listed) company.

Regulatory Matters

IT's activities are regulated by several federal, state and local agencies to varying degrees, such as the SEC, NASDAQ, DOT and state contractor licensing boards. Because of the size of IT, one or more regulatory agencies may be auditing or investigating aspects of IT's business at any given time, including OSHA and DOT. IT is not engaged in any pending state contractor licensing investigations or controversies.

Liabilities, Liens and Judgments

IT's liabilities are disclosed in its or Aegion's financial statements as required by GAAP and SEC regulations. IT may occasionally have valid bills paid later than normal credit terms and improper bills that are protested. There are no outstanding, unsatisfied liens (which are not being protested) or judgments against IT.

Lawsuits

At any given time, in the ordinary course of business, IT is involved in various civil claims and suits relating to vehicle accidents, other property damage or personal injury matters, commercial disputes (including subcontractor disputes and customer payment disputes), employee litigation and other matters. Aegion is required to report material litigation involving IT in its SEC filings.

Very truly yours,

INSITUFORM TECHNOLOGIES, LLC

By: Mark M. Favazza
Mark M. Favazza
Senior Counsel



FINANCIAL INFORMATION

Bonding Company:

Travelers Casualty & Surety Company of America
One Tower Square, 13CZ
Hartford, CT 06183
Richard W. DuPont, St. Louis Manager (314) 579-8315
AM Best Guide Rating A++ XV

Agent:

JW Terrill
825 Maryville Centre Drive, Suite 200
Chesterfield, MO 63017
Dana Johnessee (314) 594-2700
Bonding Capacity: \$500,000,000

Insurance Company:

XL Insurance Company of America/Greenwich Insurance Co.
200 Liberty St., One World Financial Center
New York, NY 10281
Nancy Rummel, (317) 374-0657

Agent:

Lockton Companies / St. Louis
#1 Cityplace Drive, Suite 160
St. Louis, MO 63141
Carol Henzler, (314) 432-0500 x3285

Banking:

Bank of America Merrill Lynch
Bank of America, N.A.
Merrill Lynch, Pierce, Fenner & Smith Incorporated
800 Market Street
St. Louis, MO 63101
Kevin M. Knopf, Sr. VP (314) 466-7726

Trade Reference:

AOC
950 HWY 57 E
Collierville, TN 38017
Bill Moore
Phone: (901) 592-9861

Auriga Polymers

1550 Dewberry Road
Spartanburg, SC 29307
Attn: Clarissa Schroeder Cell: (864) 238-9247
Phone: (864) 579-5047 / Fax: (864) 579-5779

United Initiators, Inc.

Rob Brecht, Commercial Sales Director
Cell: (816) 500-8217

Insituform Technologies, LLC

Balance Sheet

(in thousands)

	December 31, 2018
Assets	
Current assets	
Cash and cash equivalents	\$ 5,520
Receivables, net	32,570
Retainage	14,176
Contract assets	19,347
Inventories	15,171
Prepaid expenses and other	2,505
Total current assets	89,289
Property, plant and equipment, net	41,594
Non-current assets	
Goodwill	88,527
Intangibles	1,936
Deferred Income Taxes	4,040
Other long-term assets	4,080
Total non-current assets	98,583
Total assets	\$ 229,466
Liabilities and stockholders' equity	
Current liabilities	
Accounts payable	\$ 24,385
Accrued expenses	31,409
Contract liabilities	9,301
Current maturities of long-term debt	-
Total current liabilities	65,095
Non-current liabilities	
Long-term debt, less current maturities	-
Deferred income taxes	7,155
Other long-term liabilities	123
Total non-current liabilities	7,278
Stockholders' equity	
Common stock	-
Additional paid-in capital	130,102
Retained earnings	26,991
Accumulated other comprehensive loss	-
Non-controlling interest	-
Total stockholders' equity	157,093
Total liabilities and stockholders' equity	\$ 229,466



Report of Independent Auditors

To the Management of Insituform Technologies, LLC:

We have audited the accompanying balance sheet of Insituform Technologies, LLC as of December 31, 2018.

Management's Responsibility for the Balance Sheet

Management is responsible for the preparation and fair presentation of the balance sheet in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the balance sheet that is free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on the balance sheet based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the balance sheet is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the balance sheet. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the balance sheet, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the Company's preparation and fair presentation of the balance sheet in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the balance sheet. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the accompanying balance sheet presents fairly, in all material respects, the financial position of Insituform Technologies, LLC as of December 31, 2018 in accordance with accounting principles generally accepted in the United States of America.

PricewaterhouseCoopers LLP

Saint Louis, Missouri
March 8, 2019

TAB 2: PERSONNEL



Insituform[®]
an AEGION[™] company

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



Superintendent:

Kevin Morrell has been employed with Insituform since 2000 and has held a Superintendent's position since 2002. Kevin's experience far exceeds the 5-year minimum of CIPP lining requirement and 300,000 LF of 8" or greater CIPP install set forth by RFP No.PW2020-06. Below are project references to document just some of Kevin's experience in successful CIPP lining projects with Insituform.

State of Florida *Project References* *Kevin Morrell - Superintendent*

1) City of Melbourne

Project: CIPP Rehabilitation 2005 through 2020
Scope: CIPP Rehabilitation of 6" through 30" Diameter
Flow Type: Sanitary, Medium to Heavy
Project Manager: Brandt Curvel / Kendall Welsh
Job Completion: 2020
Installation: Air/Water
Contact: Mr. Matt Simon
2891 Harper Road
Melbourne, FL 32904
(321) 674-5726 F – (321) 608-5135
msimon@melbourneflorida.org

2) City of Fernandina Beach

Project: CIPP Rehabilitation 2005 through 2019
Scope: CIPP Rehabilitation of 60,000 - 8", 20,000 LF - 10", 10,000 LF - 15, 5,000 LF - 18", 1, LF - 24"
Flow Type: Sanitary – Medium to Heavy
Project Manager: Brandt Curvel / Kendall Welsh
Installation: Air/Water
Job Completion: 2019
Contact: John Mandrick
1007 S 5th Street
Fernandina Beach, FL 32034
(904) 753-1412
jmandrick@fbfl.org

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



3) City of Jacksonville

Project: CIPP Rehabilitation 2000 through 2019

Scope: CIPP Rehabilitation of 12" through 96" Diameter

Flow Type: Storm, Medium to Heavy

Project Manager: Brandt Curvel / Kendall Welsh

Job Completion: 2019

Contact: Mr. Robert Young
214 North Hogan Street
Jacksonville, FL 32202
(904) 237-5501
RYoung@coj.net

4) City of Port Orange

Project: CIPP Rehabilitation 2018 through 2020

Scope: CIPP Rehabilitation of 8" & 10" Diameter

Flow Type: Sanitary – Medium to Heavy

Project Manager: Brandt Curvel / Kendall Welsh

Job Completion: 2020

Contact: Mr. Dick Colby
1000 City Center Circle
Port Orange, FL
(386) 506-5500
rcolby@port-orange.org

REDACT STATEMENT

Insituform considers all references and project data information submitted in this bid as Confidential and/or trade secret, and requests this information is redacted when fulfilling all public requests.

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



Insituform Technologies Superintendent Installation Experience 8" through 24"; Florida; 2015-2019 - Kevin Morrell

Year Installed	Diameter	Project Name/Customer	Linear Feet
2015	8	JEA, LOMAX CLAY ST	456
2015	24	JEA, LOMAX CLAY ST	100
2015	48	JEA, MONTANA TO MANNING AVE	1,661
2015	12	JACKSONVILLE FL, SITES 1-9	63
2015	14	JACKSONVILLE FL, SITES 1-9	91
2015	15	JACKSONVILLE FL, SITES 1-9	363
2015	18	JACKSONVILLE FL, SITES 1-9	790
2015	20	JACKSONVILLE FL, SITES 1-9	280
2015	24	JACKSONVILLE FL, SITES 1-9	130
2015	30	JACKSONVILLE FL, SITES 1-9	985
2015	48	JACKSONVILLE FL, SITES 1-9	250
2015	15	JACKSONVILLE FL, SITES 1-4	867
2015	18	JACKSONVILLE FL, SITES 1-4	574
2015	24	JACKSONVILLE FL, SITES 1-4	363
2015	36	JACKSONVILLE FL, SITES 1-4	686
2015	42	JACKSONVILLE FL, SITES 1-4	491
2015	48	JACKSONVILLE FL, SITES 1-4	390
2015	18	JACKSONVILLE FL, SAN MARCO STRM	241
2015	24	DAYTONA BEACH, FL - WO1	842
2015	30	DAYTONA BEACH, FL - WO1	400
2015	36	DAYTONA BEACH, FL - WO1	450
2015	10	CLAY CO, P13/14-A10, TASK O27	334
2015	8	GRUHN-MAY, INC, NEPTUNE BEACH	1,217
2015	8	CONFIDENTIAL FL, FY 2014	10,260
2015	10	CONFIDENTIAL FL, FY 2014	821
2015	18	CONFIDENTIAL FL, FY 2014	140
2015	21	CONFIDENTIAL FL, FY 2014	1,858
2015	24	PRIME CONSGRP, DAYTONA BEACH	270
2015	18	GAINESVILLE FL, 2721 NW 37 TERR	90
2015	8	CONFIDENTIAL, FL - PO14-8994	3,552
2015	8	UTILITY SERVICE OF GAINESVILLE	661
2015	10	UTILITY SERVICE OF GAINESVILLE	287
2015	12	UTILITY SERVICE OF GAINESVILLE	371
2015	15	GH UNDERGROUND CONST JAX BEACH	72
2015	42	MASCI CORP, DAYTONA BCH AIRPRT	276
2015	24	FLORIDA DOT, COLUMBIA CO FL	227
2015	30	FLORIDA DOT, COLUMBIA CO FL	588
2015	36	FLORIDA DOT, COLUMBIA CO FL	1,001
2015	42	FLORIDA DOT, COLUMBIA CO FL	245
2015	48	FLORIDA DOT, COLUMBIA CO FL	484
2015	8	ST AUGUSTINE FL, PONCE DE LEON	3,210

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2015	15	MELBOURNE FL,STORM DRAINS	168
2015	18	MELBOURNE FL,STORM DRAINS	124
2015	30	MELBOURNE FL,STORM DRAINS	288
2015	41	MELBOURNE FL,STORM DRAINS	132
2015	15	PREFERRED MATERIAL,ALACHUA CO	93
2015	18	PREFERRED MATERIAL,ALACHUA CO	668
2015	24	PREFERRED MATERIAL,ALACHUA CO	216
2015	42	TALLAHASSEE FL,EMERGENCY 42	1,391
2015	8	ST AUGUSTINE FL,SC DEAFBLIND	547
2015	12	ST AUGUSTINE FL,SC DEAFBLIND	913
2015	48	BRUNSWICK GA, ATLANTA AVE	1,602
2015	8	HAHIRA GA, SR 122 BASIN III	2,758
2016	24	JEA, BUCKMAN WRF	111
2016	15	JACKSONVILLE FL,VARSITES 1-7	48
2016	18	JACKSONVILLE FL,VARSITES 1-7	458
2016	21	JACKSONVILLE FL,VARSITES 1-7	388
2016	24	JACKSONVILLE FL,VARSITES 1-7	352
2016	30	JACKSONVILLE FL,VARSITES 1-7	257
2016	12	JACKSONVILLE FL,PO307753:10	86
2016	15	JACKSONVILLE FL,PO307753:10	567
2016	18	JACKSONVILLE FL,PO307753:10	342
2016	21	JACKSONVILLE FL,PO307753:10	268
2016	24	JACKSONVILLE FL,PO307753:10	372
2016	30	JACKSONVILLE FL,PO307753:10	205
2016	36	JACKSONVILLE FL,PO307753:10	528
2016	12	JACKSONVILLE FL,PO307753:11	37
2016	15	JACKSONVILLE FL,PO307753:11	286
2016	18	JACKSONVILLE FL,PO307753:11	949
2016	24	JACKSONVILLE FL,PO307753:11	150
2016	30	JACKSONVILLE FL,PO307753:11	512
2016	36	JACKSONVILLE FL,PO307753:11	30
2016	42	JACKSONVILLE FL,PO307753:11	170
2016	48	JACKSONVILLE FL,PO307753:12	455
2016	54	JACKSONVILLE FL,PO307753:12	241
2016	15	JACKSONVILLE FL,PO307753:13	70
2016	18	JACKSONVILLE FL,PO307753:13	16
2016	24	JACKSONVILLE FL,PO307753:13	346
2016	36	JACKSONVILLE FL,PO307753:13	526
2016	15	JACKSONVILLE FL,PO307753:14	110
2016	18	JACKSONVILLE FL,PO307753:14	317
2016	24	JACKSONVILLE FL,PO307753:14	599
2016	30	JACKSONVILLE FL,PO307753:14	55
2016	36	JACKSONVILLE FL,PO307753:14	121
2016	15	DAYTONA BEACH, FL - WO1	816
2016	18	DAYTONA BEACH, FL - WO1	591
2016	24	DAYTONA BEACH FL,WA2,SBEACH	287
2016	30	DAYTONA BEACH FL,WA2,SBEACH	504
2016	8	CONFIDENTIAL, FL, FY 2014	6,881

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2016	10	CONFIDENTIAL, FL, FY 2014	717
2016	12	CONFIDENTIAL, FL, FY 2014	275
2016	24	CONFIDENTIAL, FL, FY 2014	254
2016	30	CONFIDENTIAL, FL, FY 2014	907
2016	12	MELBOURNE FL,2016 STORM DRAINS	35
2016	15	MELBOURNE FL,2016 STORM DRAINS	285
2016	18	MELBOURNE FL,2016 STORM DRAINS	596
2016	21	MELBOURNE FL,2016 STORM DRAINS	148
2016	24	MELBOURNE FL,2016 STORM DRAINS	393
2016	30	MELBOURNE FL,2016 STORM DRAINS	148
2016	8	CONFIDENTIAL FL,SANITARY FY15-16	11,562
2016	10	CONFIDENTIAL FL,SANITARY FY15-16	2,483
2016	12	CONFIDENTIAL FL,SANITARY FY15-16	1,748
2016	8	ST AUGUSTINE FL,CARRERA ST	1,836
2016	8	ST AUGUSTINE FL,SC DEAFBLIND	1,325
2016	12	ST AUGUSTINE FL,SC DEAFBLIND	1,006
2016	15	ST AUGUSTINE FL,SC DEAFBLIND	853
2016	24	ST AUGUSTINE FL, WO4	135
2016	42	BAKER KLEIN ENG, JAX AIRPORT	157
2016	8	JACKSONVILLE BEACH, FL	53
2016	30	JACKSONVILLE BEACH, FL	176
2016	8	CONFIDENTIAL FL, PO67722	5,381
2016	15	GH UNDERGROUND CONSTJAXBEACH	371
2016	18	GH UNDERGROUND CONSTJAXBEACH	820
2016	24	GH UNDERGROUND CONSTJAXBEACH	430
2016	10	GRUHN-MAY, NEPTUNE BEACH FL	518
2016	8	COMMERCIAL CONSTRU,MAYPORT NS	1,137
2016	24	JACKSONVILLE BEACH FL,PALMTREE	235
2016	8	CONFIDENTIAL FL, FY15-16, PO22575	4,416
2016	8	ST AUGUSTINE FL,CHARLOTTE ST	3,423
2016	12	G H UNDERGROUND, ST JOHNS CO	12
2016	15	CONFIDENTIAL FL,PO16-0524	304
2016	18	CONFIDENTIAL FL,PO16-0524	161
2016	24	CONFIDENTIAL FL,PO16-0524	184
2016	30	CONFIDENTIAL FL,PO16-0524	322
2016	36	CONFIDENTIAL FL,PO16-0524	28
2016	15	ST AUGUSTINE BEACH FL,STORM	1,298
2016	8	ATLANTIC BEACH FL,SEA OATS SUB	3,739
2016	12	ATLANTIC BEACH FL,SEA OATS SUB	856
2017	15	JACKSONVILLE FL,PO307753:15	112
2017	18	JACKSONVILLE FL,PO307753:15	556
2017	24	JACKSONVILLE FL,PO307753:15	789
2017	30	JACKSONVILLE FL,PO307753:15	71
2017	36	JACKSONVILLE FL,PO307753:15	444
2017	42	JACKSONVILLE FL,PO307753:15	352
2017	48	JACKSONVILLE FL,PO307753:15	68
2017	15	JACKSONVILLE FL,PO307753:16	182
2017	18	JACKSONVILLE FL,PO307753:16	235

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2017	24	JACKSONVILLE FL,PO307753:16	950
2017	30	JACKSONVILLE FL,PO307753:16	277
2017	36	JACKSONVILLE FL,PO307753:16	374
2017	15	JACKSONVILLE FL,PO307753:17	63
2017	18	JACKSONVILLE FL,PO307753:17	83
2017	21	JACKSONVILLE FL,PO307753:17	624
2017	24	JACKSONVILLE FL,PO307753:17	220
2017	30	JACKSONVILLE FL,PO307753:17	155
2017	36	JACKSONVILLE FL,PO307753:18	399
2017	18	JACKSONVILLE FL,PO307753:20	454
2017	24	JACKSONVILLE FL,PO307753:20	725
2017	36	JACKSONVILLE FL,PO307753:20	242
2017	18	JACKSONVILLE FL,PO307753:21	288
2017	24	JACKSONVILLE FL,PO307753:21	43
2017	36	JACKSONVILLE FL,PO307753:21	623
2017	42	JACKSONVILLE FL,PO307753:21	85
2017	8	DAYTONA BEACH FL,MADISON AVE	1,418
2017	8	CLAY COTSK ORD29,MEADOWBROOK	20,180
2017	10	CLAY COTSK ORD29,MEADOWBROOK	405
2017	12	CLAY COTSK ORD29,MEADOWBROOK	338
2017	8	JEA, RELEASE1,VAR LOC	2,640
2017	12	JEA, RELEASE1,VAR LOC	542
2017	8	JEA,REL2, VARIOUS LOC	439
2017	12	JEA,REL2, VARIOUS LOC	429
2017	8	ST AUGUSTINE FL,CHARLOTTE ST	435
2017	10	ST AUGUSTINE FL,CHARLOTTE ST	815
2017	15	ST AUGUSTINE BEACH FL,STORM	169
2017	18	ST AUGUSTINE BEACH FL,STORM	140
2017	8	ATLANTIC BEACH FL,SEA OATS SUB	1,202
2017	8	LAKE BUTLER FL,CIPP MH REHAB	2,414
2017	10	LAKE BUTLER FL,CIPP MH REHAB	332
2017	12	LAKE BUTLER FL,CIPP MH REHAB	192
2017	8	CONFIDENTIAL FL,PLAINFIELD AVE	806
2017	15	CONFIDENTIAL FL,PLAINFIELD AVE	2,114
2017	18	CONFIDENTIAL FL,PLAINFIELD AVE	1,948
2017	8	ST JOHNS COUNTY,MISC17-58	358
2017	10	ST JOHNS COUNTY,MISC17-58	48
2017	8	CONFIDENTIAL FL,2017, PO22925	330
2017	8	ST AUGUSTINE, WO 11	814
2017	10	ST AUGUSTINE, WO 11	186
2017	24	G H UNDERGROUND,JAX BEACH FL	150
2017	18	AMELIA ISLAND PLANTATION COMM	69
2017	8	ST AUGUSTINE,WO 12, BASIN 51	2,865
2017	8	JD WEBER CONST, NEW SMYRNA	4,796
2017	30	HODGES BLVD DEVELOPMENT GROUP	326
2017	15	FLORIDA DOT, COLUMBIA CO FL	93
2017	24	FLORIDA DOT, COLUMBIA CO FL	180
2017	30	FLORIDA DOT, COLUMBIA CO FL	175

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2017	36	FLORIDA DOT, COLUMBIA CO FL	207
2017	42	FLORIDA DOT, COLUMBIA CO FL	1,257
2017	48	FLORIDA DOT, COLUMBIA CO FL	383
2017	54	FLORIDA DOT, COLUMBIA CO FL	268
2017	18	NASSAU CO BOARD OF CO COMM	37
2017	24	NASSAU CO BOARD OF CO COMM	384
2017	30	NASSAU CO BOARD OF CO COMM	273
2017	36	NASSAU CO BOARD OF CO COMM	159
2017	18	CLAY COUNTY BCC, LEAP FROG LANE	437
2017	24	CONFIDENTIAL FL, LAKE LINDLEY PO23063	222
2017	8	CONFIDENTIAL FL, PO037164	1,707
2017	12	MACCLENNY FL, EMERGENCY REPAIR	204
2017	18	COUNTRY CLUB OA	55
2017	36	COUNTRY CLUB OA	302
2017	27	FL 2 LOCATIONS	295
2017	36	FL 2 LOCATIONS	369
2017	30	FL, POPO08609	380
2017	30	T B LANDMARK CONSTR, ST SIMON	94
2018	48	JACKSONVILLE FL, PO307753:20	467
2018	12	JACKSONVILLE FL, PO307753:21	55
2018	30	JACKSONVILLE FL, PO307753:21	270
2018	15	JACKSONVILLE FL, PO307753:22	641
2018	18	JACKSONVILLE FL, PO307753:22	400
2018	36	JACKSONVILLE FL, PO307753:22	160
2018	48	JACKSONVILLE FL, PO307753:22	65
2018	12	JACKSONVILLE FL, PO307753:23	46
2018	15	JACKSONVILLE FL, PO307753:23	281
2018	18	JACKSONVILLE FL, PO307753:23	1,245
2018	24	JACKSONVILLE FL, PO307753:23	553
2018	42	JACKSONVILLE FL, PO307753:23	260
2018	12	CLAY COTSK ORD29, MEADOWBROOK	397
2018	8	CLAY COTSK ORD30, PRJ01018RR	5,546
2018	10	CLAY COTSK ORD30, PRJ01018RR	1,288
2018	15	CLAY COTSK ORD30, PRJ01018RR	324
2018	18	CLAY COTSK ORD30, PRJ01018RR	213
2018	24	CLAY COTSK ORD30, PRJ01018RR	173
2018	18	MELBOURNE FL, 2018 STORM	568
2018	24	MELBOURNE FL, 2018 STORM	453
2018	36	MELBOURNE FL, 2018 STORM	143
2018	8	CONFIDENTIAL FL, 2018 SANITREL 1	713
2018	12	CONFIDENTIAL FL, 2018 SANITREL 1	281
2018	15	CONFIDENTIAL FL, 2018 SANITREL 1	1,041
2018	8	JEA, RELEASE1, VAR LOC	400
2018	8	JEA, REL2, VARIOUS LOC	190
2018	10	JEA, REL2, VARIOUS LOC	85
2018	8	JEA, REL4, BUFFALO, WOODSONG	1,078
2018	12	JEA, REL4, BUFFALO, WOODSONG	612
2018	24	JEA, REL4, BUFFALO, WOODSONG	352

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2018	36	JEA, OLIVE ST, PO177612	330
2018	8	JD WEBER CONST, NEW SMYRNA	757
2018	30	NASSAU CO BOARD OF CO COMM	140
2018	36	NASSAU CO BOARD OF CO COMM	212
2018	30	CLAY COUNTY BCC, STONEBRIDGE DR	366
2018	24	CLAY COUNTY BCC, BEGONIA ST	90
2018	18	CLAY COUNTY BOCC-BRECKENRIDGE	310
2018	8	CONFIDENTIAL FL, POPO08709	2,976
2018	10	CONFIDENTIAL FL, POPO08709	961
2018	8	NEW SMYRNA BEACH, RIVERSIDE DR	568
2018	8	FERNANDINA BEACH FL, PO18000105	4,336
2018	8	DELAND FL, FY17-18, PO23277	4,636
2018	24	GH UNDERGROUND CONBARACOA CT	220
2018	8	ST JOHNS COUNTY, WO 2	3,728
2018	8	ST JOHNS COUNTY, WO 3	1,424
2018	8	ST JOHNS COUNTY FL, TO 4	20
2018	8	ST JOHNS COUNTY FL, TO 5	843
2018	18	NASSAU CO BRD OF CC, NASSAU CO	160
2018	24	NASSAU CO BRD OF CC, NASSAU CO	338
2018	8	CONFIDENTIAL FL, CIPP LINING, PO 72149	2,281
2018	10	CONFIDENTIAL, FL, CIPP LINING, PO 72149	812
2018	8	AJ JOHNS, JACKSONVILLE FL	117
2018	8	JACKSONVILLE BEACH, FL PO180282	1,471
2018	8	CONFIDENTIAL FL, OAK HARBOR	3,560
2018	30	GAINESVILLE FL, SE 14TH AVE	247
2018	12	BEACH FLWOODLAND	270
2018	15	BEACH FLWOODLAND	229
2018	18	BEACH FLWOODLAND	367
2018	16	FERNANDINA BEACH FL, PO18000263	716
2018	21	FLUOR FEDERAL SOLUTIONS NAS	390
2018	15	MELBOURNE FL, BABOCK STREET	196
2018	18	MELBOURNE FL, BABOCK STREET	382
2018	20	MELBOURNE FL, BABOCK STREET	76
2018	24	MELBOURNE FL, BABOCK STREET	1,059
2018	30	MELBOURNE FL, BABOCK STREET	43
2018	48	MELBOURNE FL, BABOCK STREET	90
2018	8	ORANGE PARK FL, POPO09868	302
2018	8	PORT ORANGE FL, TA1, PHASE 1	4,432
2018	8	MAER CONSTRUCT, ORANGE PARK FL	758
2018	12	CONFIDENTIAL FL, PO18-1693	62
2018	18	CONFIDENTIAL FL, PO18-1693	157
2018	24	CONFIDENTIAL FL, PO18-1693	263
2018	36	CONFIDENTIAL FL, PO18-1693	178
2018	8	NEW SMYRNA BEACH, 8TH STREET	471
2018	18	PETTICOAT-SCHMITT CIVIL CONTR	153
2018	30	CONFIDENTIAL FL, PO23468	214
2018	36	CONFIDENTIAL FL, PO23468	314
2018	8	UTILITIES INC OF FLOR, LONGWOOD	2,038

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2018	10	UTILITIES INC OF FLOR, LONGWOOD	179
2018	8	NEW SMYRNA BEACH FL, BEACON ST	985
2018	8	STATESBORO GA, SANIT STORM	5,043
2018	10	STATESBORO GA, SANIT STORM	4,383
2019	8	JEA, REL2, VARIOUS LOC	371
2019	8	JEA, CARLOTTA RDW VARI LOC	276
2019	10	JEA, CARLOTTA RDW VARI LOC	390
2019	30	JEA, CARLOTTA RDW VARI LOC	35
2019	18	JEA, FY19 BUSH DR, PO181382	623
2019	8	JEA, FY19 5TH ST, PO182511	325
2019	10	JEA, FY19 5TH ST, PO182511	155
2019	12	JEA, FY19 5TH ST, PO182511	262
2019	21	JEA, FY19, ORTEGA FOREST, PO183115	1,228
2019	8	JEA, FY19, COPELAND ST, PO183116	829
2019	18	JEA, FY19, PO182290, 91, 92	298
2019	8	JEA - FL - UNIVERSITY BLVD	300
2019	10	JEA - FL - UNIVERSITY BLVD	97
2019	24	PALM COAST FL, PROVIDENCE LAND	133
2019	30	PALM COAST FL, PROVIDENCE LAND	122
2019	36	PALM COAST FL, PROVIDENCE LAND	119
2019	18	CLAY COUNTY BOCC, BREKENRIDGE II	225
2019	8	ST JOHNS COUNTY FL, TO 4	373
2019	8	ST JOHNS COUNTY FL, TO 5	650
2019	8	ST JOHNS COUNTY FL, TO 6	379
2019	8	CONFIDENTIAL FL, TA1, PHASE 1	2,080
2019	8	CONFIDENTIAL FL, TA2, PHASE 2	3,415
2019	18	PETTICOAT-SCHMITT CIVIL CONTR	169
2019	8	FLORIDA SCHOOL OF DEAF BLIND	1,985
2019	12	FLORIDA SCHOOL OF DEAF BLIND	410
2019	15	CONFIDENTIAL FL, STORM, RIVER RD	423
2019	18	CONFIDENTIAL FL, STORM, RIVER RD	143
2019	24	CONFIDENTIAL FL, STORM, RIVER RD	42
2019	30	CONFIDENTIAL FL, STORM, RIVER RD	216
2019	42	CONFIDENTIAL FL, STORM, RIVER RD	99
2019	8	CONFIDENTIAL FL, FY19 LINING	7,170
2019	10	CONFIDENTIAL FL, FY19 LINING	910
2019	12	CONFIDENTIAL FL, FY19 LINING	661
2019	24	CONFIDENTIAL FL, FY19 LINING	386
2019	30	CONFIDENTIAL FL, FY19 LINING	155
2019	15	JACKSONVILLE, FL WO1	186
2019	18	JACKSONVILLE, FL WO1	498
2019	21	JACKSONVILLE, FL WO1	93
2019	24	JACKSONVILLE, FL WO1	180
2019	30	JACKSONVILLE, FL WO1	144
2019	36	JACKSONVILLE, FL WO1	998
2019	15	JACKSONVILLE FL, P3, SITES 1-10	542
2019	18	JACKSONVILLE FL, P3, SITES 1-10	662
2019	21	JACKSONVILLE FL, P3, SITES 1-10	187

SUPERINTENDENT QUALIFICATIONS & PROJECT REFERENCES



2019	24	JACKSONVILLE FL,P3,SITES 1-10	1,202
2019	42	JACKSONVILLE FL,P3,SITES 1-10	320
2019	12	DAYTONA BEACH, FL2018 WO1	3,306
2019	18	DAYTONA BEACH, FL2018 WO1	3,617
2019	8	DB CIVIL CONSTRUCTION,BUNNELL	4,515
2019	18	MCKINNEY COMMERCIAL CONSTRUC	255
2019	8	PW NORFLEET, GAINESVILLE FL	173
2019	10	NEPTUNE BEACH FL, PO9040	1,650
2019	8	DB CIVIL CONSTRUCTION,BUNNELL	3,679
2019	10	DB CIVIL CONSTRUCTION,BUNNELL	1,073
2019	15	DB CIVIL CONSTRUCTION,BUNNELL	635
2019	8	CONFIDENTIAL FL, PO23792	3,263
2019	10	CONFIDENTIAL FL, PO23792	320
2019	24	FERNANDINA BEACH FL,RAYONIER	868
2019	15	CONFIDENTIAL FL,PO19-2153	204
2019	18	CONFIDENTIAL FL,PO19-2153	75
2019	45	CONFIDENTIAL FL,PO19-2153	62
2019	58	CONFIDENTIAL FL,PO19-2153	58
2019	8	CONFIDENTIAL FL,S3RDEFLOIDA	351
2019	30	VE WHITEHURST SONS,NW 43RD	300
2019	30	GAINESVILLE FL,NW 35TH TERRACE	219
2019	18	AMELIA ISLAND PLANTATION COMM	90
2019	30	ALACHUA COUNTY BCC,NW 43RD ST	350
2019	8	CHATHAM COUNTY GA, REL1	853
2019	15	CHATHAM COUNTY GA, REL1	198
2019	18	CHATHAM COUNTY GA, REL1	262
2019	15	CHATHAM COUNTY GA, REL2	61
2019	18	CHATHAM COUNTY GA, REL2	145
2019	24	CHATHAM COUNTY GA, REL2	220
2019	30	CHATHAM COUNTY GA, REL2	50
2019	36	CHATHAM COUNTY GA, REL2	310
Total Footage Installed			305,491

INSTALLATION CREW QUALIFICATIONS



Install Crew: Foreman

Terrence Chapman is our current foreman and has been employed with Insituform since 2002. Mr. Chapman far exceeds the minimum qualification experience of 20,000 LF of 8" or greater in successful CIPP installations. Please refer to the info/projects below.

Boiler Tech:

Troy Hausler is our current boiler technician and has been employed with Insituform since 2016. Mr. Hausler far exceeds the minimum qualification experience of 5 projects totaling 50,000 LF of successful CIPP installations. Please refer to the info/projects below.

Lateral Cutter Tech/Lead CCTV Inspector:

Justin Brown is our current lateral cutter technician and lead CCTV Inspector and has been employed with Insituform since 2016. Mr. Brown far exceeds the minimum qualifications for lateral cutter tech which requires at least 5 projects totaling 2,000 service laterals cut. Please refer to the info/projects below. Mr. Brown also is NASSCO PACP certified and a copy of his current license is below.

Based on Installations from January 1, 2016 to February 1, 2020

Title	Name	LF Installed	Laterals Cut	Number of Projects	Meets Requirement
Foreman	Terrence Chapman	367,905	N/A	149	YES
Boiler Tech	Troy Haulser	367,905	N/A	149	YES
Lateral Cutter Tech	Justin Brown	367,905	3,159	81	YES

REDACT STATEMENT

Insituform considers all reference and project data information submitted below as Confidential and/or trade secret, and requests this information is redacted when fulfilling all public requests.

Project Name	LF Installed	Laterals Cut
JEA, BUCKMAN WRF	111	0
JACKSONVILLE FL,VARSITES 1-7	1,503	0
JACKSONVILLE FL,PO307753:10	2,368	0
JACKSONVILLE FL,PO307753:11	2,134	0
JACKSONVILLE FL,PO307753:12	696	0
JACKSONVILLE FL,PO307753:13	958	0
JACKSONVILLE FL,PO307753:14	1,202	0
JACKSONVILLE FL,PO307753:15	2,392	2
JACKSONVILLE FL,PO307753:16	2,018	4
JACKSONVILLE FL,PO307753:17	1,145	0
JACKSONVILLE FL,PO307753:18	399	0
JACKSONVILLE FL,PO307753:20	1,888	0
JACKSONVILLE FL,PO307753:21	1,364	0
JACKSONVILLE FL,PO307753:22	1,266	0
JACKSONVILLE FL,PO307753:23	2,385	0
DAYTONA BEACH, FL - WO1	1,407	0
DAYTONA BEACH FL,WA2,SBEACH	791	8
DAYTONA BEACH FL,MADISON AVE	1,418	22
DAYTONA BEACH FL,WISTERIA RD	1,296	1
GAINESVILLE REGUTIL,FY15,REL1	245	6
GAINESVILLE REGUT,AB REHAB	7,976	23
GAINESVILLE REG UT - WO25	961	0
GAINESVILLE REGUT,PROJ H-O	4,093	65
GAINESVILLE REGUT,FY18,PJA-D	7,715	87
GAINESVILLE REGUT,FY18,PJEF	1,386	0
CLAY COTSK ORD29,MEADOWBROOK	24,791	249
CLAY COTSK ORD30,PRJ01018RR	7,544	95
COCOA BEACH FL, FY 2014	9,034	104
MELBOURNE FL,2016 STORM DRAINS	1,605	0
MELBOURNE FL,SANITARY FY15-16	15,878	132
MELBOURNE FL,2017 STORM REL1	609	0
MELBOURNE FL,2018 STORM	1,164	0
MELBOURNE FL,2018 SANITREL 1	2,035	13
BREVARD COUNTY,PO4500086789	3,825	48
ST AUGUSTINE FL,CARRERA ST	1,836	44
ST AUGUSTINE FL,SC DEAFBLIND	3,184	12
ST AUGUSTINE FL, WO4	135	0
BAKER KLEIN ENG, JAX AIRPORT	157	0
JACKSONVILLE BEACH, FL	229	0
COCOA FL, PO67722	5,381	117
GH UNDERGROUND CONSTJAXBEACH	1,621	0
GRUHN-MAY, NEPTUNE BEACH FL	518	0
JEA, RELEASE1,VAR LOC	3,582	51
JEA,REL2, VARIOUS LOC	1,514	4
JEA,REL4,BUFFALO,WOODSONG	2,042	24
JEA,OLIVE ST,PO177612	330	0
COMMERCIAL CONSTRU,MAYPORT NS	1,137	13

Project Name	LF Installed	Laterals Cut
JACKSONVILLE BEACH FL,PALMTREE	235	0
DELAND FL, FY15-16, PO22575	4,416	72
BREVARD COUNTY,PO4500090322	525	2
ST AUGUSTINE FL,CHARLOTTE ST	4,673	141
G H UNDERGROUND, ST JOHNS CO	54	0
WEST MELBOURNE FL,PO16-0524	999	0
ST AUGUSTINE BEACH FL,STORM	1,607	0
ATLANTIC BEACH FL,SEA OATS SUB	5,797	59
BREVARD COUNTY,PO4500093232	12,247	97
LAKE BUTLER FL,CIPP MH REHAB	2,938	11
ORANGE PARK FL,PLAINFIELD AVE	4,868	37
ST JOHNS COUNTY,MISC17-58	406	0
DELAND FL,2017, PO22925	330	6
ST AUGUSTINE, WO 11	1,000	3
G H UNDERGROUND,JAX BEACH FL	150	0
AMELIA ISLAND PLANTATION COMM	159	0
ST AUGUSTINE,WO 12, BASIN 51	2,865	59
JD WEBER CONST, NEW SMYRNA	5,553	103
HODGES BLVD DEVELOPMENT GROUP	326	0
FLORIDA DOT, COLUMBIA CO FL	2,563	1
NASSAU CO BOARD OF CO COMM	1,205	0
CLAY COUNTY BCC,LEAP FROG LANE	437	0
CLAY COUNTY BCC,STONEBRIDGE DR	366	0
CLAY COUNTY BCC,BEGONIA ST	90	0
CLAY COUNTY BOCC-BRECKENRIDGE	310	0
DELAND FL,LAKE LINDLEYPO23063	222	0
JACKSONVILLE BEACH FL,PO037164	1,707	7
MACCLENNY FL,EMERGENCY REPAIR	204	0
ORANGE PARK COUNTRY CLUB OA	357	1
ORANGE PARK, FL 2 LOCATIONS	664	0
ORANGE PARK FL,POPO08609	380	0
ORANGE PARK FL,POPO08709	3,937	23
BREVARD CO FL,PO4500096709	15,259	90
NEW SMYRNA BEACH,RIVERSIDE DR	568	8
FERNANDINA BEACH FL,PO18000105	4,336	63
DELAND FL,FY17-18,PO23277	4,636	92
GH UNDERGROUND CONBARACOA CT	220	0
ST JOHNS COUNTY, WO 2	3,728	31
ST JOHNS COUNTY, WO 3	1,424	17
ST JOHNS COUNTY FL,TO 4	393	4
ST JOHNS COUNTY FL,TO 5	1,493	28
NASSAU CO BRD OF CC,NASSAU CO	498	0
COCOA FL,CIPP LINING,PO 72149	3,093	31
AJ JOHNS,JACKSONVILLE FL	117	1
JACKSONVILLE BEACH,FL PO180282	1,471	6
ATLANTIC BEACH FL,OAK HARBOR	3,560	46
GAINESVILLE FL, SE 14TH AVE	247	0

Project Name	LF Installed	Laterals Cut
ST AUGUSTINE BEACH FLWOODLAND	866	0
FERNANDINA BEACH FL,PO18000263	716	0
FLUOR FEDERAL SOLUTIONS NAS	390	0
MELBOURNE FL,BABOCK STREET	1,846	0
ORANGE PARK FL,POPO09868	302	2
PORT ORANGE FL,TA1,PHASE 1	6,512	109
MAER CONSTRUCT,ORANGE PARK FL	758	5
WEST MELBOURNE FL,PO18-1693	660	0
NEW SMYRNA BEACH,8TH STREET	471	4
PETTICOAT-SCHMITT CIVIL CONTR	322	0
DELAND FL, PO23468	528	0
UTILITIES INC OF FLOR,LONGWOOD	2,217	10
NEW SMYRNA BEACH FL,BEACON ST	985	21
T B LANDMARK CONSTR,ST SIMON	94	0
STATESBORO GA,SANIT STORM	9,426	85
GAINESVILLE REGUT,FY19P1-8D	10,297	85
GAINESVILLE REGUT,FY19PA-CE	22,600	107
GAINESVILLE REGUT,FY19PF,G,H	900	2
CLAY COTSK ORD31,GREENWOOD	372	5
JEA,CARLOTTA RDW VARI LOC	701	2
JEA,FY19 BUSH DR,PO181382	623	0
JEA,FY19 5TH ST,PO182511	742	13
JEA,FY19,ORTEGAFOREST,PO183115	1,228	2
JEA,FY19,COPELAND ST,PO183116	829	14
JEA,FY19,PO182290,91,92	298	0
JEA - FL - UNIVERSITY BLVD	762	11
PALM COAST FL,PROVIDENCE LAND	374	0
CLAY COUNTY BOCC,BREKENRIDGEII	225	0
ST JOHNS COUNTY FL,TO 6	379	0
PORT ORANGE FL,TA2,PHASE 2	3,415	64
FLORIDA SCHOOL OF DEAF BLIND	2,395	5
BREVARD CO FL,FY19,VARI POS	2,938	27
ORANGE PARK FL,STORM,RIVER RD	923	0
ORANGE PARK FL,FY19 LINING	9,282	62
JACKSONVILLE, FL WO1	2,099	0
JACKSONVILLE FL,P3,SITES 1-10	2,913	3
DAYTONA BEACH, FL2018 WO1	6,923	70
DB CIVIL CONSTRUCTION,BUNNELL	9,902	90
MCKINNEY COMMERCIAL CONSTRUC	255	0
PW NORFLEET, GAINESVILLE FL	173	0
NEPTUNE BEACH FL, PO9040	1,650	0
DELAND FL, PO23792	3,583	59
FERNANDINA BEACH FL,RAYONIER	868	0
WEST MELBOURNE FL,PO19-2153	399	0
MACCLENNY FL,S3RDEFLOIDA	351	2
VE WHITEHURST SONS,NW 43RD	300	0
MELBOURNE FL,FY2020,REL1	5,797	67

Project Name	LF Installed	Laterals Cut
GAINESVILLE FL,NW 35TH TERRACE	219	0
BREVARD CO FL, FY2020	754	11
WEST MELBOURNE FL,PO20-2557	2,928	32
COCOA BEACH FL,FY2020, LS 16	820	11
ALACHUA COUNTY BCC,NW 43RD ST	350	1
ORANGE PARK, FL - AZALEA LN	245	3
CHATHAM COUNTY GA, REL1	1,313	12
CHATHAM COUNTY GA, REL2	786	0
Totals	367,905	3,159

CERTIFICATE OF COMPLETION

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Justin Brown



Certificate Number: U-0818-0703002830

Sheila Joy

Sheila Joy
Executive Director



Since 2018
Issued: 08/30/2018
Expires: 08/29/2021

Note: The user is not an employee, agent or partner of NASSCO. The user acknowledges and agrees that NASSCO does not supervise or control the user and that NASSCO shall not be responsible for any acts or omissions of the user.

Kendall Welsh

Area Manager

Key Qualifications

- ♦ Area Manager for over 400+ government/municipal utility projects
- ♦ 24 years of experience and 23 years with Insituform
- ♦ Area Manager for Insituform's Southeast area operations with the states of Florida, Georgia, South Carolina, North Carolina, and Virginia

Florida General Contractors License – CGC1510306

Georgia Utility Manager License – UM102173

North Carolina PU (Water & Sewer Lines) License 42890

South Carolina Water & Sewer Lines License BCO1014362

Years of Industry Experience
23 Years

Years of Similar Project Experience
23 Years

Education

Bachelor of Science, Industrial Technology, 1993
Texas State University

Training

NCCER National Registry
OSHA 10 Hour
Confined Space Entry
Trenching and Shoring in compliance with 29 CFR Part 1926.650
American Safety & Health Institute – CPR
American Safety & Health Institute – First Aid
American Safety & Health Institute – Blood borne Pathogens
Safe Handling of traffic in Construction and Maintenance Areas
AGC Construction Management
JEA – Safety Leadership Development

OVERVIEW

Mr. Welsh controls and directs the management team within the Southeast United States. He is specifically trained in all aspects of sewer evaluation and rehabilitation work. He is directly responsible for the daily execution of the fieldwork as well as the collection of all field-related data. Mr. Welsh is responsible for all management related items to complete a project. He is currently responsible for the entire operations for the State of Florida, Georgia, South Carolina, and North Carolina. He manages six offices within the area with approximately 100 employees. Mr. Welsh's areas of expertise include Cured in Place Pipe, Pipe Bursting, Micro Tunneling, Slip Lining, Open Cut construction, trenchless lateral replacement, large diameter rehabilitation, and general construction management projects.

During his 22 years with Insituform Mr. Welsh has been involved with the installation of over 4,500,000 feet of cured in place pipe, over 700,000 feet of pipebursting, over 35,000 feet of microtunneling, over 10,000 feet of sliplining, over 50,000 feet of open cut, and has been involved with over 12,000 lateral replacements or rehabilitation. Mr. Welsh has several years of hands on experience with all aspects of evaluation and rehabilitation operations. Mr. Welsh has also been involved in a significant amount of sewer reconstruction work. He has worked on Government/Municipal projects, Department of Transportation projects, Industrial projects, and Military projects.

KEY PROJECT EXPERIENCE

Jacksonville Electric Authority High Volume Pipebursting Project

Client / Location: (JEA) Jacksonville Electric Authority, Jacksonville FL

Project Duration: 2000-2003 **Project Role:** Project Manager

Project Manager for the rehabilitation of existing 6", 8", 10", 12", and 15" mainline sewer, and the rehabilitation of house laterals to the mainline pipe. The project consisted of 588,566 feet of pipebursting mainline sewer and over 12,000 rehabilitated laterals. Contract value \$75,566,942

Macon Water Authority – Sanitary Sewer Rehabilitation Project

Client / Location: Macon, GA

Project Duration: 2010-2011 **Project Role:** Area Manager

Project consisted of pipeline rehabilitation with a combined scope of 28,950 linear feet and diameters of 21", 24", 30", and 54". The project was in three areas within Macon and required bypass pumping for each phase. The main scope of the project was the 54" pipe which required extensive scheduling demands for the completion of this phase due to the 54" line running down the middle of the largest park in Macon. Contract value \$5,280,642

City of Melbourne – Annual Sanitary and Storm Sewer Rehabilitation Contract

Client / Location: Melbourne, FL

Project Duration: 2009-2014 **Project Role:** Area Manager

This is an annual contract with undefined scope work. Currently the work has consisted of 8" – 24" cured in place pipe for sanitary sewer and 15" – 60" cured in place pipe for storm sewers. Over the last five years the contract value has been in excess of three million dollars.

City of Tampa -

Client / Location: Port of Tampa Waste Water Treatment Plant, FL

Project Duration: 2012 **Project Role:** Area Manager

The project consisted of rehabilitating an existing 72" PCCP pipe with 72" CIPP



RICK SCOTT, GOVERNOR

JONATHAN ZACHEM, SECRETARY



STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION
CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

WELSH, KENDALL THOMAS

INSITUFORM TECHNOLOGIES LLC

4144 LONICERA LOOP

ST. JOHNS

FL 32259

LICENSE NUMBER: CGC1510306

EXPIRATION DATE: AUGUST 31, 2020

Always verify licenses online at MyFloridaLicense.com



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Brandt Curvel

Project Manager

17 Years Project Management work experience in trenchless rehabilitation (eight years with Insituform Technologies LLC)

Education

Undergraduate Studies – University of North Florida - Bachelors Degree - Marketing

Experience

Mr. Curvel controls and directs field crews that are specifically trained in all aspects of sewer evaluation and rehabilitation work. He is directly responsible for the daily execution of the fieldwork as well as the collection of all field-related data. Mr. Curvel is responsible for scheduling projects, managing sub-contractor work and evaluating time and personnel to complete a project. He is responsible for all management related items to complete a project. Mr. Curvel's areas of expertise include Cured in Place Pipe, Pipe Bursting, Slip Lining, Open Cut construction and trenchless lateral replacement.

Over the past seventeen years, Mr. Curvel has been involved with over 500,000 feet of cured in place pipe, over 700,000 feet of pipe bursting, over 50,000 of open cut, and has been involved with over 8,000 lateral replacements. Mr. Curvel has several years of hands on experience with all aspects of evaluation and rehabilitation operations.

Mr. Curvel's direct responsibilities include all Project Management and Administration in the North and Central Florida Area for Insituform Technologies LLC.

Training

JEA – Safety Leadership Development

Confined Space Entry

Trenching and Shoring in compliance with 29 CFR Part 1926.650

OSHA 10 HR

Key Projects Managed

- JEA High Volume Pipe Bursting Contract – 2000 to 2003
- City of Monticello Area Wide Sewer Improvements – 2009 to 2010
- Town of Macon 54" Central City Park – 2010 to 2011
- City of Daytona Beach Lift Station 10 Part B Improvements – 2014 to 2015
- Cocoa Beach Area Sanitary Sewer Rehabilitation Program – 2015 to 2016

Al Yeomans

General Superintendent

Education

17+ Years work experience with Insituform Technologies

Experience

Mr. Yeomans manages over the operation team that is specifically trained in all aspects of sewer evaluation and rehabilitation work in North Florida. He is directly responsible for the daily execution of fieldwork as well as the collection of all field-related data. Mr. Yeomans is in charge of safety; quality, production, training and scheduling of ITI install crews and subcontractors. He currently manages two install crews and several subcontractors on different contracts. Mr. Yeomans areas of expertise includes Cured in Place Pipe, Pipe Bursting, Micro Tunneling, Slip Lining, Open Cut construction, trenchless lateral replacement, large and small diameter rehabilitation with Air/Steam or Water installation.

During his 17 years with ITI Mr. Yeomans has been involved with the installation of over 1,000,000 feet of cured in place pipe, over 400,000 feet of pipe bursting, over 10,000 feet of micro tunneling, over 75,000 of open cut, and has installed over 5,000 laterals. Mr. Yeomans has several years of hands on experience with all aspects of evaluation and rehabilitation operations. He has also been involved in a significant amount of sewer reconstruction work. Mr. Yeomans has work on Municipal projects, Department of Transportation projects, Industrial projects and Military projects.

Training

JEA – Safety Leadership Development

NCCER National Registry – JEA Construction Site Safety Orientation

Confined Space Entry

Trenching and Shoring in compliance with 29 CFR Part 1926.650

OSHA 10-Hour Course

American Safety & Health Institute – CPR

American Safety & Health Institute – First Aid

Safe Handling of Traffic in Construction and Maintenance Areas



Jason Burnell
Superintendent

Insituform Technologies, LLC

(June 1992 – Present)

Experience

Mr. Burnell manages over the crew's operation that is trained in Air/Steam and Water inversion of sewer rehabilitation work all over the state of Florida. He is directly responsible for the daily execution of fieldwork as well as the collection of all field-related data. Mr. Burnell is in charge of safety, quality, training and scheduling of Insituform's install crew's daily tasks. He currently manages a six-man install crew. Mr. Burnell areas of expertise include Cured in Place Pipe for large and small diameter rehabilitation for trenchless technologies.

During his 20 years with Insituform Mr. Burnell has been involved with the installation of over 1,000,000 feet of cured in place pipe from sizes 8" – 84". Mr. Burnell has several years of hands on experience with all aspects of evaluation and rehabilitation operations. He has also been involved in a significant amount of sewer reconstruction work. Mr. Burnell has work on Municipal projects, Department of Transportation projects, Industrial projects and Military projects.

Training

Confined Space Entry
Trenching and Shoring in compliance with 29 CFR Part 1926.650
OSHA 10-Hour Course
American Safety & Health Institute – CPR
American Safety & Health Institute – First Aid
Safe Handling of Traffic in Construction and Maintenance Areas



Kevin P. Morrell

Objective Obtaining a growth oriented position with an emphasis in safety and quality production.

Experience 2000-Present Insituform Jacksonville, FL

Superintendent /Job Coordinator

- Started with the company in the position of foreman and was promoted to Superintendent in 2002.
- Responsible for the management and training of salaried and hourly employees in the areas of manholes, repairs, services, mainline service, punch-out and other subject matter.
- Advanced knowledge in high volume pipe-bursting, microtunnelling, and open cut procedures.
- Estimate and purchase required items for multiple job sites, including rental procurement.
- Complete working knowledge of all phases and specifications of underground sewer utilities.

1996-2000 J.B. Coxwell Construction Jacksonville, FL
Pipe/Punch-out Foreman

- Lead a high production pipe / punch-out crew while maintaining an outstanding safety record at the assigned site.
- Successful hiring practices, progressive employee management and continued employee training produced low turn over rates.
- Successfully repaired broken lines, laid new water and sewer lines utilizing engineering drawings, and connected water and sewer services while maintaining a very low failure rate.

1994-1996 Hubbard Construction Jacksonville, FL
Crew Chief

- Hands on supervision position of a successful work crew.
- Safely and effectively operated varied heavy equipment.
- Excellent accuracy record in maintaining road and ditch layout plans as provided by the state.

1993-1994 Hynes Bond Ellison Company Jacksonville, FL
Merchandiser

- Effectively maintained key retail accounts in North Florida and South Georgia.
- Collected and correlated data for the presentation to the retail client.
- Great time management skills employed to accomplish a challenging travel schedule.

Education & Training Graduate in good standing Allen Denise High School, Saint Augustine, FL

- Trained in the operation of most types of backhoes, track-hoes, loaders, and dozers.
- Certified in confined space excavation.
- Efficient 10 key and forklift operator.

Christina Gossell
2408 Dundee Court West
Orange Park, FL 32065
Cell: 904-309-4105
[*gossellchristina@hotmail.com*](mailto:gossellchristina@hotmail.com)

Objective

To acquire a challenging career path in which I can fully utilize my skills within a rewarding and exciting work environment.

Capabilities

More than 15 years' experience in an office environment with recognized strengths in problem-solving, troubleshooting, staff support, planning and implementing proactive procedures and systems. My experience also includes more than 7 years of project management support including field operations and accounting.

Proficient in Microsoft Excel, Word, Access, Outlook, Powerpoint, QuickBooks, Microsoft Windows® Operating System, Masterbuilder, Primavera Expedition, Primavera Infomaker, Prolog, Xactimate, Adobe Acrobat XI Pro, JD Edwards, Type 65 wpm.

Employment History

Insituform Technologies, LLC – Area Administrator – Sept 2016 – Current

Reporting directly to the Project Manager my responsibilities include, AP and AR reporting and invoicing. Processing and tracking of subcontracts, subcontractor billings, change orders and insurance certificates. My responsibilities also include providing direct support to all crew personnel, including ordering supplies, helping with driver logs, phone issues and expense reporting. Maintaining CDL driver compliance, scheduling DOT Physicals and supporting HR with the onboarding process for new crew members.

Kimley-Horn and Associates – Administrative Assistant – July 2014 – Sept 2016

Providing Office Management, Administrative Support and Production Support to the Roadway Design Group and the Project Design Environmental Group. Including bid packages, contract administration, subcontracts, plans management, processing and tracking of shop drawings, processing and tracking of request for information. Setting up and coordinating Public Meetings and Hearings for projects impacting local communities.

T B Landmark Construction, Inc. – Jr. Project Manager – November 2010 – July 2014

Project Management from the bidding process through completion of the project. Including contract administration, subcontracts, plans management, bond recording, processing and tracking of submittals, contractor's request for clarification and invoicing. All project correspondence including notice to owners, lien releases, warranty and punch out items. Supporting field operations including scheduling of material deliveries, ordering equipment and setting up out of town crew accommodations. Major accomplishment during my tenor at T B Landmark was managing 23 miles of 6"-8" gas lines installed via Horizontal Directional Drilling from Jacksonville to Fernandina Beach. This project was completed under budget and ahead of schedule.

Water Damage / Mold Remediation Company - Office Manager September 2009 - May 2010

Reporting directly to the President as second in command. Responsible for HR, Payroll, Accounts Receivable, Accounts Payable, Bank Account Reconciliation, Contract Administration, Insurance Billing and Computer Issues just to name a few. Responsible for efficiently running a small business office wearing many different hats and prioritizing many different tasks throughout the day.

Christina Gossell
2408 Dundee Court West
Orange Park, FL 32065
Cell: 904-309-4105
[*gossellchristina@hotmail.com*](mailto:gossellchristina@hotmail.com)

Employment History (Cont.)

McMurry Construction, Inc. Jacksonville, FL – Office Manager / Construction Admin, November 2007 – September 2009

Reporting directly to the Project Manager and the Site Superintendent on a 230 room hotel located in Downtown Jacksonville. Set up and ran jobsite office. Responsibilities included contract administration, plans management, processing and tracking of submittals, contractor's request for clarification, invoicing, purchase orders, meeting minutes, notice to owners, lien releases, change orders, non-compliance notices, warranty & punch out. Scheduling and ordering of materials such as concrete, rebar, and equipment needed for daily operations. Also responsible for Human Resources including processing employment applications, layoff paperwork, payroll and accident related paperwork.

Compass Group, Inc. Fernandina Beach, FL –Executive Assistant, May 2007 – October 2007

Promoted to Executive Assistant reporting directly to the President. Responsibilities include answering multi line phone, calendar management, travel arrangements, legal correspondence and day to day operations while continuing to maintain my previous Jr. Project Manager duties (see below).

Compass Group, Inc. Fernandina Beach, FL –Jr. Project Manager, June 2005 – May 2007

Provided administrative support to the Project Manager, Site Superintendent and Subcontractors. Including contract administration, plans management, processing and tracking of submittals, contractor's request for clarification, invoicing, all project correspondence including notice to owners, lien releases, change orders, non-compliance notices to sub-contractors, warranty, punch out and pay applications. Also responsible for bidding new jobs & some marketing.

Han-Padron Associates, Jacksonville, FL - Administrative Assistant, Sept 2003 – June 2005

Served as Administrative Assistant for three Engineers' including processing and tracking of Submittals, Contractor's Request for Clarification and the processing of any Change Orders. Set up and ran a small construction office. Directed all administrative and project support efforts. Prepared bi-weekly time, expense, and travel reports. Scheduled and managed all site meetings.

Education

Santaluces High School, Boynton Beach, FL 1993
Attended Palm Beach Community College, Palm Beach, FL
Notary License 2022

References

Will be made available upon request

Frank M. Noonan

6966 Business Park Blvd., Jacksonville, FL 32256

OVERVIEW

Mr. Noonan is ISP Safety Director with responsibility for U.S. based operations for Insituform Technologies, Fibrwrap, Fyfe, MTC, and Underground Solutions. Mr. Noonan has served Aegion/Insituform for the past 5 years, participating in the development and implementation of several programs and procedures that enhanced the overall Company safety performance. Mr. Noonan reports directly to the Vice President of Aegion Health and Safety.

Mr. Noonan has over 29 years of experience in the safety, health and environmental arena working with local, state, federal, and private sector clients.

EXPERIENCE

AEGION CORPORATION, Chesterfield, Missouri

DIRECTOR, HEALTH AND SAFETY – AEGION CORP. INFRASTRUCTURE SOLUTIONS PLATFORM (5/2019 – present)

AREA SAFETY MANAGER, INSITUFORM TECHNOLOGIES (3/2015 – 5/2019)

Responsibilities include:

- Work with senior management to direct the development of an effective global strategy to assess and mitigate strategic and operational safety and security-related threats/risks, manage crises and incidents, and safeguard the organization.
- Development and implementation of safety initiatives
- Facilitate open and candid safety related communications with all frontline employees to improve safety outcomes
- Develop and manage departmental budget
- Plan and implement safety training
- Assess effectiveness of safety program activities, policies and procedures and implement changes to improve results and achieve objectives
- Assure compliance with the governing federal, state and local health & safety regulations
- Manage, mentor and coach Safety Professionals, in all procedures for safe work operations
- Develop and implement health and safety policies and training
- Prepare health and safety plans and support to Company Operations Teams
- Manage reporting requirements for OSHA and EPA
- Perform accident investigations and claims management
- Establish safety systems within the Company and drive changes to enable continuous risk reduction
- Initiate proactive vs. reactive Safety initiatives aimed at reducing workplace injuries

TRAINING

Confined Space Entry

CPR/AED/First Aid Training

Hazardous Material Train-the-Trainer

ESIS and Liberty Mutual Defensive Driver Safety - Train the Trainer

MSHA 24-Hour Mine Safety & Health Training

OSHA 40-Hour Asbestos Supervisor/Contractor Training

OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Training

OSHA 8-Hour HAZWOPER Refresher, annually since 1991

OSHA HAZWOPER Site Safety Officer Training and HAZWOPER Supervisor Training

OSHA 30-Hour Construction Safety Training

RCRA Hazardous Waste Compliance and Management

Temporary Traffic control, Advanced Program (FDOT)

U.S. Army 40-hour Environmental Compliance Officer Training

PROFESSIONAL CERTIFICATIONS/ASSOCIATION

CHST - Construction Health & Safety Technician (No. C2282), Board of Certified Safety Professionals

CESCO Certified Environmental Compliance and Safety Officer (No. 655243547), NREP

REM - Registered Environmental Manager (No. 592901611), NREP

EMS Certified AED/CPR/First Aid Trainer

OSHA #500 Construction Outreach Trainer, Authorized Trainer OSHA 10/30 Hour - Construction Industry

PEC Safe Supervisor, Authorized Instructor

Qualified Stormwater Management Inspector (Insp. No. 5205), FDEP

SafeStart Certified Trainer



Insituform
Technologies, LLC

17988 Edison Avenue
Chesterfield, MO 63005
www.insituform.com

Insituform Technologies, LLC is a subsidiary of Aegion Corporation

Insituform Personnel Company Resume

Charles R. Gordon, President & Chief Executive Officer

Mr. Gordon serves as our President and Chief Executive Officer. Most recently, Mr. Gordon served in the position of Chief Executive Officer of Natural Systems Utilities, LLC, a distributed water infrastructure company and he continues to be a member of its Board of Directors. Prior to Natural Systems Utilities, Mr. Gordon served as President and Chief Operating Officer of Nuverra Environmental Solutions, Inc. from October 2010 through September 2013. Nuverra provides environmental services to the oil and gas industries. Mr. Gordon served as Chief Executive Officer of Siemens Water Technologies, a business unit of Siemens AG, a world leader in products, systems and services for water and wastewater treatment for industrial, institutional and municipal customers, from 2007 through 2010. Previously, Mr. Gordon served as President of the Siemens Water Technologies Systems Division from 2005 through 2006. Mr. Gordon was named President of USFilter's Service and Products Division in 1999, which was later acquired by Siemens. Mr. Gordon was named Vice President of the Southern Region of Arrowhead Industrial Water (later acquired by USFilter) in 1991.

Ralph Western, President, Senior Vice President and General Manager

Mr. Western serves as Vice President and General Manager of Infrastructure Solutions and is responsible for the overall growth and profitability of Aegion's Infrastructure Solutions platform. Mr. Western has been with Aegion for than 10 years and has almost 25 years of experience in the manufacturing and engineering sector and has his MBA from Wesleyan University. He has a proven track record of driving productivity improvement and delivering results during his tenure at Aegion.

David F. Morris, Executive Vice President

Mr. Morris joined Aegion in 2005 as our Vice President, General Counsel and Secretary from the law firm of Thompson Coburn LLP, where he was a partner in its corporate and securities practice areas. He became our Chief Administrative Officer in 2007 and was promoted to Executive Vice President in 2014 and appointed Interim Chief Financial Officer in November 2017.

Mark A. Menghini, Senior Vice President, & Secretary

Mr. Menghini joined Aegion in 2013 as our Deputy General Counsel. He was appointed Senior Vice President in October 2014 and most recently served as the Company's Senior Vice President, Deputy General Counsel and Assistant Secretary. Prior to joining Aegion, Mark was an officer and shareholder with the law firm of Greensfelder, Hemker & Gale, P.C., a regional law firm based in St. Louis, Missouri.

Kenneth L. Young, Senior Vice President & Treasurer

Mr. Young has served as our Vice President and Treasurer since April 2009. Prior to that time, he served as the Chief Financial Officer, Secretary and Treasurer for Huttig Building Products, Inc., a public company based in St. Louis, Missouri, from 2005 to 2009, and as Corporate Treasurer for MEMC Electronic Materials, a public company based in St. Louis, Missouri, from 1989 to 2005.



MARK DALMAU

markd@bdlc.net

2424 Tyler Street

Kenner, LA. 70062

(305) 746-2950

POSITION:

- **Project Manager - Cured-In-Place-Pipe (CIPP) Lateral Lining**

PROFESSIONAL TRAINING:

- Hazmat Course, Confined Space Entry Training, Supervisory Safety Course, Lateral Installation Course, Boiler Operation Course, First Aid/CPR, Blood Borne Pathogens, Trench/Excavation Competent Person Training, OSHA 10-Hour Construction Safety and Health Training, PACP and LACP Certified by NASCO.

EXPERIENCE:

- Over 22 years of experience in construction management and trenchless sewer rehabilitation managing CIPP installation and lateral installation crews
- Served BLD Services, LLC since February 2010
- Previous 15 years with Insituform Technologies, Inc. working his way through the ranks as Foreman, Superintendent, Field Engineer, General Superintendent and Project Manager
- Performs work in the states of Florida, Louisiana and other areas in the Eastern United States and Puerto Rico

Expanding his experience in CIPP lateral installation supervision, successfully installed over 5,000 CIPP Laterals and over 2,000,000 on CIPP Mainline

WORK HISTORY:

Project Manager, Operations: 2010 – Present

BLD Services, LLC – Florida

- Oversee and coordinate operations associated with BLD's five CIPP lateral rehabilitation crews. Enhance and development of our Laterals products and equipment

Project Manager: 2006 – 2010

Insituform Technologies, Inc. – Miami, FL

- Oversee rehabilitation and evaluation crews activities, setting goals and production standards
- Schedule work to meet customer deadlines
- Responsible for managing Hammond's business unit, generating revenues in excess of 15 million annually, as well as meeting the profitability objectives of the business unit as defined by the corporation

General Superintendent: 2000 - 2006

Insituform Technologies, Inc. – Miami, FL

- Managed all aspects of planning, prepping, and execution of all sewer rehabilitation projects in South Florida, including project manpower, equipment, and scheduling; client and subcontractor management; assurance of compliance with technical specifications and quality.

MARK E. DALMAU

- Providing leadership to a diverse group of employees – from field laborers to highly-seasoned engineers and estimators – motivating all towards the goal of the team
- Managed and lead through crews and performed all projects under budget and with minimal quality errors.
- Built ISO Certification program that served as a model for other regions to follow and certify crew members.
- Established and implemented a set of controls, processes and systems to stream-line all work – from project set-up to restoration.

Superintendent: 1994 - 2000**Insituform Technologies, Inc. – San Juan, P.R / Miami, FL**

- Supervised a 3 man CIPP installation crew
- Over 1,000,000 LF of small diameter CIPP installed
- Over 100,000LF of Med/Large diameter CIPP installed
- Successfully managed over 100 Projects in multiple areas and multiple diameters.
- Managed multiple, concurrent projects in various stages ranging in project revenue size from \$25k to \$5M.
- Managed 400,000lf of small diameter Term contract in South Florida from 1996-2000
- Managed over 50,000lf of small diameter term contract in San Juan, P.R. from 1994-1996

RESPONSIBILITIES:

- Plan, direct and manage all activities of assigned projects to ensure company objectives for customer satisfaction, safety, quality, production, revenue and profit are met in a timely manner.
- Supervise and facilitate the construction phase of projects by directly managing multiple crews and subcontractors while providing oversight for production, safety and quality.
- Site surveys, contract execution/project start-up and closeout. Work with field crews and subcontractors to manage project costs, meet expected production rates and gross profit margins.
- Supervise and coordinate activities of workers engaged in all phases of pipe rehabilitation applications.
- Directly supervise activities of workers engaged in all phases of cured-in-place pipe and required applications, such as service connection reinstatement/cleanup.

Selected Projects for CIPP Sewer Lateral Rehabilitation:

❖ Tallahassee, FL	Hialeah Gardens, FL	Pompano Beach, FL
❖ Oakland Park, FL	Naples, FL	Longboat Key, FL
❖ Clay County, FL	Orange County, FL	Miami Dade, FL
❖ West Palm Beach, LA	Jacksonville, FL	Plantation, FL
❖ Marianna, FL	Fort Lauderdale, FL	Lakeland, FL

EDUCATION:**1991 – 1992 / Elmhurst Technical College – New York, N.Y.**

- Associate of Science on Industrial Mechanics



JONDELL JOHNSON

2424 Tyler St.
Kenner, LA 70062
(504) 466-1344

POSITION:

- **General Superintendent – Cured-In-Place-Pipe (CIPP) Lateral Lining**

PROFESSIONAL TRAINING:

- Hazmat Course, Confined Space Entry Training, Supervisory Safety Course, Lateral Installation Course, First Aid/CPR Hazmat Course, OSHA 10-Hour Construction Safety and Health Training, Trench/Excavation Competent Person Training, PACP and LACP certified by NASCO, Intermediate MOT Set Up's Certified by FDOT.

EXPERIENCE:

- Over 15 years of experience in trenchless sewer rehabilitation
- Served BLD Services, LLC since February 2010
- Previous 6 years with Insituform Technologies Inc.
- Performs work in the states of Florida, Louisiana and other areas in the Southeast
- Expanding his experience in CIPP lateral installation he has successfully installed over 3500 CIPP laterals
- Promoted himself through the ranks of laborer, field technician, operator and superintendent
- Expertise includes cured-in-place-pipe, lateral reconstruction and internal point repair rehabilitation as well as cleaning operations and television inspection

RESPONSIBILITIES:

- Directly responsible for the daily execution of the field work along with the collection of all field related data
- Managing his crew through the completion of numerous lateral rehabilitation projects
- Responsible for the ongoing training of his crew members
- Building a respectable team of experienced lateral installers
- Responsible to insure and perform premium quality work

Selected Projects for CIPP Sewer Lateral Rehabilitation:

❖ Baltimore, MD	Milford, DE	Lexington Park, MD
❖ Baton Rouge, LA	Naples, FL	Tonawanda, NY
❖ Boston, MA	New Castle County, DE	Longboat Key, FL
❖ Clay County, FL	North Miami, FL	West Palm Beach, FL
❖ Clayton, LA	Orange County, FL	Medley, FL
❖ Fayetteville, NC	Plantation, FL	Miami Dade County, FL
❖ Fort Lauderdale, FL	Pompano Beach, FL	St. Petersburg, FL
❖ Hialeah Gardens, FL	South Bend, IN	Leesburg, FL
❖ Kennard, IN	St. Louis, MO	
❖ Lakeland, FL	Tamarac, FL	



HENRY FIGUEROA

2424 Tyler St.
Kenner, LA 70062
(504) 466-1344

POSITION:

- **Superintendent – Cured-In-Place-Pipe (CIPP) Lateral Lining**

PROFESSIONAL TRAINING:

- Hazmat Course, Confined Space Entry Training, First Aid/CPR, Blood Borne Pathogens, Lateral Installation Course, OSHA 10-Hour Construction Safety and Health Training, Trench/Excavation Competent Person Training, PACP and LACP Certified by NASCO, Intermediate MOT Set Up's Certified by FDOT.

EXPERIENCE:

- Over 13 years of experience in construction and trenchless sewer rehabilitation
- Served BLD Services, LLC since June 2012
- Previous 6 years with Insituform Technologies Inc.
- Performs work in the state of Florida and other areas in the Southeast
- Expanding his experience in CIPP lateral installation he has successfully installed over 3,200 CIPP laterals
- Promoted himself through the ranks of laborer, field technician, Foreman
- Expertise includes cured-in-place-pipe, lateral reconstruction and internal point repair rehabilitation as well as cleaning operations, television inspection, smoke testing, dye water flooding and manhole inspection

RESPONSIBILITIES:

- Directly responsible for the daily execution of the field work along with the collection of all field related data
- Managing his crew through the completion of numerous lateral rehabilitation projects
- Responsible for the ongoing training of his crew members
- Building a respectable team of experienced lateral installers
- Responsible to insure and perform premium quality work

Selected Projects for CIPP Sewer Lateral Rehabilitation:

- | | |
|-------------------------|-------------------|
| ❖ Boynton Beach, FL | Oakland Park, FL |
| ❖ Coca Beach, FL | Orange County, FL |
| ❖ Coral Gables, FL | Plant City, FL |
| ❖ Lakeland, FL | Plantation, FL |
| ❖ Manatee County, FL | Pompano Beach, FL |
| ❖ Miami Dade County, FL | St Petersburg, FL |
| ❖ Naples, FL | Tallahassee, FL |
| ❖ New Castle County, DE | Tamarac, FL |
| ❖ North Miami, FL | |

TAB 3: REFERENCES



Insituform®
an AEGION™ company

STATE OF FLORIDA REFERENCES



State of Florida *References*

- 1) City of Port Orange
Mr. Richard Colby
Public Works and Utility Project Manager
1000 City Center Circle
Port Orange, FL 32129
386-506-5760
rcolby@port-orange.org
(DOCUMENTED COASTAL REFERENCE)
- 2) City of Fernandina Beach
Mr. John Mandrick, P.E.
Utilities Director
1007 S. 5th Street, Fernandina Beach, FL 32034
904-753-1412
jmandrick@fbfl.org
- 3) Clay County Utility Authority
Mr. Steve Rencarge
Lead Field Operations Coordinator
3176 Old Jennings Road, Middleburg, FL 32068
904-213-2433
srencarge@clayutility.org
- 4) City of West Melbourne
Mr. Mark Piccirillo
Public Works Director
1415 Henry Avenue, West Melbourne, FL 32904
321-837-7777
MPiccirillo@westmelbourne.com
- 5) City of Jacksonville
Mr. Robert Young
Public Works Contract Construction Manager
214 North Hogan Street, Jacksonville, FL 32202
904-237-5501
RYoung@coj.net

STATE OF FLORIDA

REFERENCES



6) St. Johns County Utility Department
Mr. James Overton, P.E.
Engineer - Capital Improvements
1205 State Road 16, St. Augustine, FL 32084
joverton@sjcfl.us

ADDITIONAL REFERENCES:

7) Clay County Public Works
Mrs. Michelle Duncan
Field Operations Coordinator
5 Esplande Avenue, Green Cove Springs, FL 32043
Michelle.Duncan@claycountygov.com

8) City of Melbourne
Mr. Mike Brink
Utilities Director
2881 Harper Road, Melbourne FL 32901
321-722-5366
Mike.brink@mlbfl.org

9) City of Cocoa
Mr. Chris Collier
Field Operations Manager
351 Shearer Boulevard
Cocoa, FL 32922
ccollier@cocoafl.org

10) City of Jacksonville Beach
Mr. Chuck Herndon
Public Works
1460 Shetter Avenue
Jacksonville Beach, FL 32250
Hernden@jaxbchfl.net

REDACT STATEMENT

“Insituform considers all reference and project data information submitted in this bid as Confidential and/or trade secret, and requests that this information is redacted when fulfilling any/all public records requests.”



CITY OF PORT ORANGE

1000 CITY CENTER CIRCLE
PORT ORANGE, FLORIDA 32129
TELEPHONE 386-506-5500
FAX 386-756-5290
www.Port-Orange.org

February 21, 2020

The City of Port Orange has had an ongoing contract with Insituform Technologies, LLC for the past two years with one more year remaining on the contract. To date Insituform has lined over 6000 LF of main and approximately 4000 LF of sewer laterals with no issues.

I first used Insituform back in the mid 90's on a project at Maxwell Airforce Base with great success so when I started here at Port Orange and saw the results from an I&I study the first thing that came to mind was Insituform. Port Orange being a coastal community where of line are underwater 365 days a year. Since we started this contract our flows at the plant have been reduced by 30% or more.

Insituform Technologies, LLC and their subs have been a pleasure to work with and extremely helpful in working with us to solve our I&I problem. The staff is very professional from upper management right down the field crews.

If I can be of further assistance please do not hesitate to call.

Thank you
Richard A Colby
City of Port Orange
Public Works and Utilities Project Manager
Phone (386) 506-5760



City of Fernandina Beach

UTILITIES DEPARTMENT

February 18th, 2020

To whom it may concern,

Insituform has lined over 96,000 feet of sewer pipe ranging in size from 8" to 24" for the City of Fernandina Beach without issue. Our ground water table is only a couple of feet below the surface and our pipe materials date back to 1888. The pipes we have lined are Vitrified Clay, Cast Iron, ABS truss pipe, Orangeburg, and Concrete. Our experience with Insituform has been excellent. When minor issues have developed concerning line cleaning they have been very responsive to our customers. I would highly recommend this company for any underground lining work.

Sincerely,

John Mandrick, PE
Utilities Director



Clay County Utility Authority

3176 Old Jennings Rd.
Middleburg, Florida 32068-3907
Telephone (904) 272-5999
Facsimile (904) 213-2498

Working together to
protect public health,
conserve our natural
resources, and create
long-term value for
our ratepayers.

February 21, 2020

To Whom it may concern:

It is our pleasure to offer this letter of recommendation for Insituform Technologies, LLC (ITL). Currently, ITL is providing services under a continuing contract with our organization on Task Order No. 32. This task order consists of Cleaning, CCTV, and lining of our laterals and mains. Past projects included services such as pipe bursting, installation of clean-outs, and manhole work. We have worked closely with ITL for nearly 19 years and are extremely satisfied with their ability to complete projects on time and in a safe, professional manner. The value of an average project completed by ITS is approximately \$600,000k.

The communication provided by ITL, not only to the Clay County Utility Authority, but to our customers is outstanding. ITL keeps us informed of their proposed work schedules and provides quick, professional responses when addressing any issues identified throughout the course of the project. They are always willing to resolve any problems as they arise and often go above and beyond what is expected. In addition, ITL provides notification to our customers regarding upcoming work and always respond promptly and courteously to questions about processes or procedures received from our staff and our customers. We are blessed to have ITS as part of our team and look forward to working with them for many years to come.

Respectfully,
CLAY COUNTY UTILITY AUTHORITY

Steve Rencarge, Lead Field Operations Coordinator
Janice Loudermilk, Distribution and Collection Department Administrator
Leslie Hess, Distribution and Collection Administrative Assistant

MAYOR
Hal J. Rose

DEPUTY MAYOR
John Dittmore

COUNCIL MEMBERS
Daniel Batchelder
Pat Bentley
Adam Gaffney
Barbara A. Smith
Andrea Young



Public Works Department
Mark Piccirillo, Public Works Director
Public Works Facility
1415 Henry Avenue
West Melbourne, FL 32904
Phone: (321) 727-3710
Fax: (321) 952-0924
www.westmelbourne.org

February 20, 2020

To Whom It May Concern,

RE: Reference Letter for Insituform Technologies, LLC

The City of West Melbourne has been conducting business with Insituform Technologies, LLC since May of 2007. They have been the City's sole source for the annual lining of sanitary sewer gravity pipes and storm drainage pipes. We continue to work with ITL year after year due to the quality of material used for the lining of the pipes and how efficient their personnel are both in the office and out in the field. ITL continues to submit competitive pricing and has proven to demonstrate good quality of work plus the ease of working directly with their personnel. This communication has proven to result in minimal issues and timely completion of their projects.

We at the City of West Melbourne look forward to working with ITL next budget year!

Sincerely,

A handwritten signature in black ink, appearing to read "M. Piccirillo". The signature is fluid and cursive, with a large, sweeping "M" and a long, trailing "P".

Mark Piccirillo, Public Works Director
City of West Melbourne
1415 Henry Avenue
West Melbourne, FL 32904
mpiccirillo@westmelbourne.org
Office: (321) 727-3710

From: [Young, Robert](#)
To: [Dave Raymond](#)
Subject: [EXTERNAL]RE: Reference Letter for St. Augustine Bid - Large Annual Contract
Date: Wednesday, February 19, 2020 8:22:11 AM
Attachments: [image003.png](#)
[CIPP Liner data 2000-2002.pdf](#)
[LINER DATA 2007-2012.pdf](#)
[LINER DATA 2013-18pdf.pdf](#)
[CIPP Site Log 2019xls.pdf](#)

Good Morning,

I can attest that Insituform has contracted with the City of Jacksonville for more than 20 years in which time they have successfully performed repairs using CIPP Trenchless technology to repair well over 500,000 linear feet storm sewer lines of all sizes from 12"-96" and materials from Reinforced Concrete, Corrugated Metal (Steel, Aluminum, Asphalt Coated, Spiral Band Etc..)P, A-2000 Terracotta, Brick Pipe, PVC, ADS, HP, Hardie Pipe, and Ductile Iron.

These repairs have been made on storm drains ranging in length from 15' to in excess of 500' in length.

Insituform Technologies has successfully won bid packages ranging from \$20k to over \$500k in value. They have performed this work in a timely manner with minimal issue.

We look forward to continuing our relationship with this contractor.

Please see the attached logs dating back to 2000.

Thank You

Robert Young
PW Contract construction Manager
City of Jacksonville
Public Works/ RWSM
904-255-4294
904-237-5501



ONE CITY. ONE JACKSONVILLE

From: Dave Raymond [mailto:draymond@aegion.com]
Sent: Monday, February 17, 2020 2:14 PM
To: Young, Robert
Subject: Reference Letter for St. Augustine Bid - Large Annual Contract

EXTERNAL EMAIL: This email originated from a non-COJ email address. Do not click any links or



St. Johns County Board of County Commissioners

Utility Department

February 19, 2020

Insituform Technologies, LLC
6966 Business Park Blvd.
Jacksonville, FL 32256

Subject: Utility Rehabilitation and Construction Services
Letter of Recommendation

To Whom It May Concern:

Insituform Technologies LLC (ITL) is currently under continuing contract with the St. Johns County Utility Department (SJCUD) to provide cleaning, inspecting and cured-in-place-pipe (CIPP) lining services. Mr. Raymond, Mr. Curvel and their staff have always been professional in handling the tasks assigned to them, which mainly include trenchless repair of existing vitrified clay pipe (VCP) and ductile iron pipe (DIP) gravity sewer mains in SJCUD's Main and Ponte Vedra systems. Since 2017, ITL has completed multiple task orders totaling just under \$1 million worth of work.

ITL staff has always been available to answer any questions and are quick to respond to any requests. Field crews are well experienced and have proven they can complete assigned tasks professionally and in a timely manner. I highly recommend ITL for any cleaning, inspection and CIPP lining projects. They are reliable, knowledgeable, and provide a quality finished product.

Sincerely,

A handwritten signature in blue ink that reads "James Overton".

James Overton, P.E.
Engineer - Capital Improvements
St. Johns County Utility Department

TAB 4: PROJECT MANAGEMENT



Insituform[®]
an AEGION[™] company

PROPOSED SUBCONTRACTORS

**(This form must be completed and included in proposal submittal under TAB 4
or the Proposal will be determined to be Non-Responsive)**

1. Name and address of subcontractor: BLD Services, LLC
2424 Tyler Street, Kenner , La. 70062

Description of work: CIPP Lateral Lining, Clean & Televising of Laterals, Installation of Sectional Liners

Estimated value of Work: \$1,630,800.00 63.70%

2. Name and address of subcontractor: Proline Vactor Services Inc.
P.O. Box 651140, Lake Worth Fl. 33454

Description of work: Cleaning & Televising of Service Mains, Root Removal, Tuberculation Removal, and Grouting.

Estimated value of Work: \$2,500.00 .10%

3. Name and address of subcontractor: Underground Pipeline Rehabilitation (UPR)
6422 US-84, Patterson, Ga. 31557

Description of work: Cleaning and Televising of Service Mains, Tuberculation Removal, Root Removal, and Point Repairs.

Estimated value of Work: \$228,275.00 8.9%

4. Name and address of subcontractor: JB Underground Construction, Inc.
17053 Oak Hill Rd Hillard, Fl: 32046

Description of work: Point Repairs, Cleanouts, and Sidewalk/Asphalt Repair

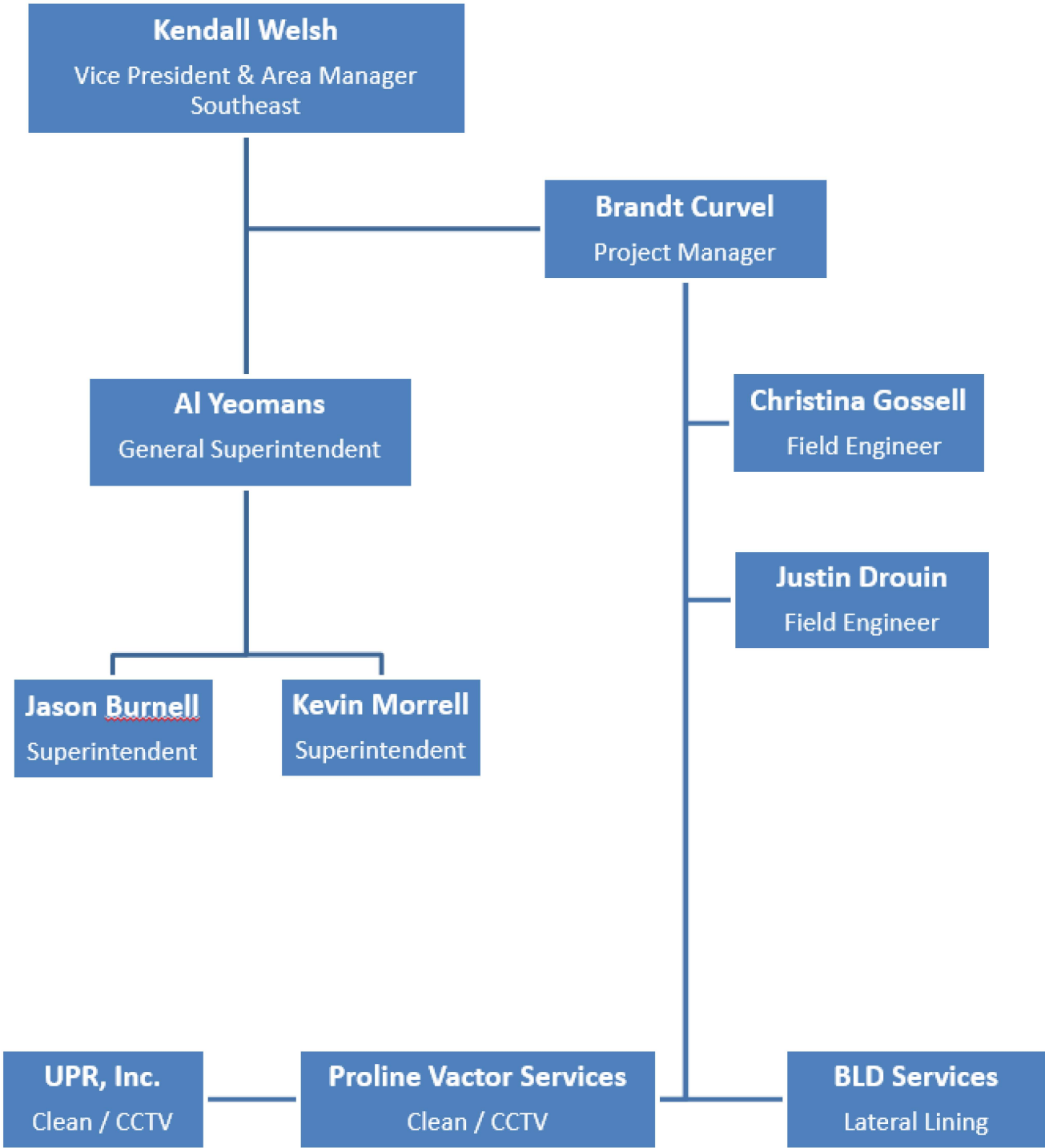
Estimated value of Work: \$2,136.00 .10%

5. Name and address of subcontractor: Dukes Root Control
1020 Hiawatha Blvd West Syracuse, NY 13204

Description of work: Root Control

Estimated value of Work: \$11,623.00 .45%

ORG CHART



PROJECT TEAM



Both globally and locally, Insituform project teams are unmatched in the industry. Our staff is some of the most experienced in the industry – from engineering, manufacturing, wetout, to installation. These functions, all ISO 9001:2015, are all handled in-house by seasoned industry veterans.

In response to this RFP, our local team is no different. The following outlines our operational staff that has successfully performed previous similar projects for the City, and is our intended staff for future work:

Vice President & Area Manager

Kendall Welsh has been with Insituform for 23 years. Mr. Welsh is the area manager for Insituform's Southeast operations including Florida, Georgia, South Carolina, North Carolina and Virginia. He has been involved with the installation of over 4,500,000 feet of cured in place pipe and over 12,000 lateral replacements or rehabilitation. He has worked on projects ranging from Government/Municipal projects, Department of Transportation projects, Industrial projects, and Military projects.

Project Manager

Brandt Curvel has been with Insituform for 9 years and has managed a multitude of CIPP projects ranging from gravity stormwater and gravity sewer, as well as specialized pressure pipe projects in the North Florida and Georgia areas. His project experience covers the fast response of small projects, to the detailed planning and coordination of concurrent sizeable multi-million-dollar projects. Mr. Curvel's direct responsibilities include all project management aspects in the North and Central Florida area, as well as the Southeast area for the State of Georgia.

General Superintendent

Al Yeomans has been with Insituform for 18 years and has experience with a wide range of CIPP projects. His wide-ranging experience includes specialty large diameter installations using the Over-the-Hole (OTH) method, and pressure pipe installations, as well as traditional small, medium, and large diameter gravity sanitary and gravity stormwater CIPP projects. Mr. Yeomans is in charge of safety, quality, production, training and scheduling of ITL install crews and subcontractors.

Field Engineer

Christina Gossell has been with Insituform for 4 years. She reports directly to the Project Manager and her duties include: supervise and facilitate the construction phase of projects by directly managing sub-contractors, work with field crews and sub-contractors to manage project costs, meet expected production times, and safety compliance.

Field Engineer

Justin Drouin has been with Insituform for 2 years. He provides oversight and project support for production, safety, quality and project management standards. He is responsible for pre-bid surveys, contract execution/project start-up and closeout. His position requires a strong focus on customer satisfaction

PROJECT TEAM



Field Superintendent

Kevin Morell has been with Insituform for 18 years and has installation experience with a variety of project types and installation methods. His expertise lies in both sanitary and storm sewers projects, utilizing both water inversion/water cure, as well as air inversion/steam cure installation methodologies. His rich field experience has netted the successful installation of approximately 400,000 LF of CIPP in the last five years alone. Mr. Morrell was the foreman on Insituform's previous annual contract with the City and is responsible for the successful CIPP installation on 5 of the 20 project references submitted.

Field Superintendent

Jason Burnell has been with Insituform for 28 years and is directly responsible for the daily execution of fieldwork and all field-related data. Mr. Burnell's expertise lies in both sanitary and storm sewer projects as well as safety, quality, training and scheduling of Insituform's install crew's daily tasks. He has been involved with the installation of over 1,000,000 feet of cured in place pipe from sizes 8" through 84".

UPR, Inc.

Rodney James is the owner of Underground Pipeline Rehabilitation, Inc. (UPR) and has been subcontracting work in the Southeast with Insituform for over 20 years. UPR's main scope of work is cleaning and televising of service mains, point repairs, open cut replacements and cleanout installations. Insituform and UPR have continued a successful business relationship for over 20 years with an open and honest relationship.

Proline Vector Services

Todd Blum is the owner of Proline Vector Services and has been subcontracting work in the Florida market for over 20 years. Mr. Blum has been a Florida State licensed underground utility contractor since 1988. Proline's main scope of business is cleaning and televising of service main, grouting, and the installation of sectional CIPP liners. Insituform and Proline have continued a successful relationship by working together as a team and extensive communication.

BLD Services

BLD purchased the Lateral Lining Division of Insituform over 10 years ago and have continued to work with Insituform since its inception. BLD has 5 crews in the Southeast and is very well positioned to perform work for the City of St. Augustine. BLD's goal is to safely and successfully respond to the City of St. Augustine's needs quickly and promptly.

This project team has worked closely in Florida together for 9 years and has successfully installed well over 2,000,000 linear feet of CIPP. Collectively, all three have worked together simultaneously over the past 5 years on 5 of the project references submitted including the City of Melbourne, Brevard County, Gainesville Regional Utilities, Jacksonville Electric Authority, City of St. Augustine, Clay County Utility Authority, City of Cocoa, City of Deland and City of Daytona Beach term contract projects.

TAB 5: TECHNICAL MERIT



Insituform®
an AEGION™ company

QA/QC & SCHEDULE CONTROL



Quality Control

Insituform's commitment to quality assurance/quality compliance (QA/QC) is unparalleled in our industry. It starts at the corporate level and is infused in our company's culture – it is evident in our engineering, manufacturing and wetout – and culminates in our quality installations. Our quality management program is managed by designated quality personnel, who work tirelessly with respective staff to develop, maintain, and improve internal processes, in accordance with our industry leading ISO:9001 quality program.

Insituform's program governs the in-house manufacturing, wetout, and installation of our cured-in-place processes, and we are the only cured-in-place (CIPP) company in North America that can boast such a program. To a large degree, higher levels of quality are inherent in our processes and internal structure, stemming from years of research, development, and testing.

For 20 years, Insituform's Quality Management System (QMS), based on ISO 9001, has been the means by which we take actions and set goals for the benefit of our customers, suppliers, our work environment and the environment in which we operate. It involves a series of components, each which help to identify, drive, maintain and improve the highest levels of quality throughout our processes and is comprised of the following components:

Context of the Organization – Defines the needs and expectations of internal/external parties and determines the scope of the quality management system

Leadership – Outlines leadership policies and defines organizational roles, responsibilities and authorities

Planning – Identifies and analyzes risks and opportunities with relationship to the quality management system and satisfy customer requirements as well as establishes measurable quality objectives

Support – Defines the resources needed to maintain and implement the QMS to meet quality objectives and product requirements and ensuring valid and reliable monitoring.

Operations – Utilizes documented quality plans, processes, procedures, and design outputs to identify customer needs and ensure the release of products and services meets those standards.

Performance Evaluation – Provides for the implementation of the monitoring, measurement, analysis and improvement processes as needed including internal auditing and management review

Improvement – Continually improves the effectiveness of the quality management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review

To aid in the various stages of the installation process, Insituform has established Inspectors Guides that are resources provided to assist owners, engineers, and their inspectors with the work instructions and guidelines for successful installation. The Inspectors Guides have been

QA/QC & SCHEDULE CONTROL



established using decades of field experience and have been refined over time to help ensure that installation QA/QC is maintained and all involved parties are on the same page and working together as a team to ensure quality installations.

Tube Manufacturing

Many companies offering trenchless rehabilitation depend on others for the technology and products they use. They have little or no control over the production of the materials they install in your sewer system. At Insituform, we manufacture our Insituform® CIPP tubes at our manufacturing facilities, which are certified to ISO 9001:2008 standards. Therefore, we control every step of the manufacturing process and have the quality systems in place to ensure that our tubes are made to our exact specifications. As a sole-source provider, our total quality system ensures consistency in CIPP tube manufacturing and reliability during installation.

We select only premium-quality raw materials to manufacture the tubes used in Insituform® CIPP. To ensure that they meet our specifications for thickness and strength, we put each tube through more than 25 separate quality checks. These tests, along with the detailed records we keep, help ensure that all of our tubes meet our stringent quality standards for trenchless CIPP rehabilitation.

To create uniform thickness around the full circumference of the Insituform® tube, we developed and patented a method for sewing together the butted ends of our felt. Our experience has shown that the strongest tubes with the fewest wrinkles are made with butt-sewn seams. Overlapped seams often create uneven thickness and surface wrinkles.

We then coat our felt tubes with a permanently-bonded, continuous layer of polypropylene, which is 50 percent thicker than conventional coatings. The polypropylene coating is firmly bonded to the felt and is resistant to hydrolysis and chemical attack. We have found that our polypropylene coating lasts longer than the polyurethane coating used by other companies offering trenchless pipeline rehabilitation.

Schedule Control

As a vertically integrated company, Insituform directly handles the engineering and design, manufacturing, wetout and CIPP installation, allowing us better direct control of a larger number of project components. By having the unique capability to oversee these elements with our own workforce, and not being dependent on additional manufacturers or suppliers, we have the ability to better maintain project schedules, and adapt to changes in weather, field conditions, or parameters that have the potential to affect project schedules.

As a general contractor, skilled in managing complex construction projects that involve a variety of both self-performed and subcontracted activities in sequence, we use a specialized software program, Primavera P6 to help ensure that project schedules are both well planned, and well executed. The use of Primavera P6 enables us to identify and maintain a project's Critical Path, and to keep project timelines on track for successful completion, as well as integrate any scope or sequencing changes that may arise.

By utilizing Primavera P6 as a scheduling tool, we can adjust accordingly to handle any weather related changes or updates to our project schedule and easily assess the potential impact to any other project tasks/milestones, making informed decisions on what, if any, these potential changes may have on the overall project.

QA/QC & SCHEDULE CONTROL



Skilled project management is another critical factor in our control of scheduling. Our project managers and field engineers have the unique experience of managing annual contracts in Florida and are well versed in keeping these projects properly scheduled and on track for timely completion. Insituform is uniquely positioned as the pioneer of performing CIPP on annual contracts. As the industry leader, no other CIPP company can boast the number of annual contracts currently and historically performed in the State of Florida. The same expertise in project/program management will be applied to this project.

A copy of our ISO-9001 Certification is included below.



CERTIFICATE OF REGISTRATION

This is to certify that

Insituform Technologies, LLC

Headquarters

17999 Edison Avenue Chesterfield, Missouri 63005 USA

Refer to Attachment to Certificate of Registration dated March 8, 2018 for additional certified sites
operates a

Quality Management System

which complies with the requirements of

ISO 9001:2015

for the following scope of certification

Design, development, manufacturing and installation of products for the rehabilitation of pipelines using trenchless technology. Certification of installation services is non-transferrable and applies only when performed directly by Insituform Technologies, LLC.

Certificate No.: CERT-0101077

File No.: 1650845

Issue Date: March 8, 2018

Original Certification Date: February 11, 2014

Certification Effective Date: March 15, 2017

Certification Expiry Date: March 14, 2020

Nicole Grantham
General Manager SAI Global Certification Services



ISO 9001



SAI GLOBAL

INFORM. INSPIRE. IMPROVE.

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

File No.		Effective Date
1650845	Insituform Technologies, LLC Headquarters 17999 Edison Avenue Chesterfield , Missouri 63005 USA Design, development, manufacturing and installation of products for the rehabilitation of pipelines using trenchless technology	March 15, 2017
1650848	Insituform Technologies, LLC Wetout 7605 18th Street Edmonton , Alberta T6P 1N9 Canada Manufacturing	March 15, 2017
1650849	Insituform Technologies, LLC Wetout 912 Stanton Road Olyphant , Pennsylvania 18447 USA Manufacturing	March 15, 2017
1650850	Insituform Technologies, LLC Wetout 468 Cypress Road Ocala , Florida 34472 USA Manufacturing	March 15, 2017
1650851	Insituform Technologies, LLC Wetout 2255 West 85th North Cedar City , Utah 84721 USA Manufacturing	March 15, 2017
1650852	Insituform Technologies, LLC Installation East 20 Fox Chase, Ste B Cartersville , Georgia 30126 USA Preparation and Installation	March 15, 2017
1650853	Insituform Technologies, LLC Installation West 9654 Titan Court Littleton , Colorado 80125 USA Preparation and Installation	March 15, 2017

These registrations are dependent on Insituform Technologies, LLC Headquarters (File No. 1650845) maintaining their scope of registration to ISO 9001:2015

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

1650854	Insituform Technologies, LLC Manufacturing 160 Corporate Drive Batesville , Mississippi 38606 USA Manufacturing	March 15, 2017
1650855	Insituform Technologies, LLC Wetout 2130 Stout Field West Drve Indianapolis , Indiana 46241 USA Manufacturing	March 15, 2017
1650856	Insituform Technologies, LLC Wetout 3061 Dublin Circle Bessemer , Alabama 35022 USA Manufacturing	March 15, 2017
1650857	Insituform Technologies, LLC Wetout 6526 Bluebonnet Parkway McGregor , Texas 76657 USA Manufacturing	March 15, 2017
1650858	Insituform Technologies, LLC Wetout 91-255 Kalaeloa Boulevard Kapolei , Hawaii 96707 USA Manufacturing	March 15, 2017
1650859	Insituform Technologies, LLC Installation Central 580 Goddard Avenue Chesterfield , Missouri 63005 USA Preparation and Installation	March 15, 2017
1650860	Insituform Technologies, LLC Installation Canada 5743 - 68 Avenue NW Edmonton , Alberta T6B 3P8 Canada Preparation and Installation	March 15, 2017
1650863	Insituform Technologies, LLC Installation - Eastern Region 709 E. Ordinance Road Baltimore , Maryland 21226 USA	March 15, 2017

These registrations are dependent on Insituform Technologies, LLC
Headquarters (File No. 1650845) maintaining their scope of registration to
ISO 9001:2015

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

Preparation and Installation.

1650864	Insituform Technologies, LLC Installation - Eastern Region 253 B Worcester Road Charlton , Massachusetts USA	March 15, 2017
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Preparation and Installation.

1650865	Insituform Technologies, LLC Installation - Eastern Region 3898 Welden Drive Lebanon , Ohio USA	March 15, 2017
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Preparation and Installation.

1650866	Insituform Technologies, LLC Installation - Eastern Region 6972 Business Park Blvd. Jacksonville , Florida USA	March 15, 2017
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Preparation and Installation.

1650867	Insituform Technologies, LLC Installation - Eastern Region 9001 NW 97 Terrace Suite F Medley , Florida 33178 USA	March 15, 2017
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Preparation and Installation.

1650868	Insituform Technologies, LLC Installation - Eastern Region 1819 John Moore Rd. Monroe , North Carolina 28110 USA	March 15, 2017
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Preparation and Installation.

1650869	Insituform Technologies, LLC Installation - Eastern Region 3016 U.S Highway 301 N. Suite 900 Tampa , Florida USA	March 15, 2017
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Preparation and Installation.

1650870	Insituform Technologies, LLC Installation - Eastern Region 3061 Dublin Circle Bessemer , Alabama 35022 USA	March 15, 2017
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Preparation and Installation.

1650872	Insituform Technologies, LLC installation - Eastern Region	March 15, 2017
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These registrations are dependent on Insituform Technologies, LLC
Headquarters (File No. 1650845) maintaining their scope of registration to
ISO 9001:2015

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

5033 Mosson Rd. Fort Worth , Texas 76119 USA

Preparation and Installation.

1650873	Insituform Technologies, LLC Installation - Eastern Region 18378 Tom Dr. Hammond , Louisiana USA	March 15, 2017
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Preparation and Installation.

1650874	Insituform Technologies, LLC Installation - Eastern Region 13502 Almeda School Road Houston , Texas 77047 USA	March 15, 2017
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Preparation and Installation.

1650876	Insituform Technologies, LLC Installation - Eastern Region 1410 Gould Blvd LaVergne , Tennessee USA	March 15, 2017
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Preparation and Installation.

1650877	Insituform Technologies, LLC Installation - Western Region 19000 MacArthur Blvd, Ste 800 Irvine , California 92831 USA	March 15, 2017
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Preparation and Installation.

1650878	Insituform Technologies, LLC Installation - Western Region 8620 Antelope N. Rd. - Ste 1 Antelope , California USA	March 15, 2017
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Preparation and Installation.

1650879	Insituform Technologies, LLC Installation - Western Region 645 W. 24th St., Ste 102 Tempe , Arizona USA	March 15, 2017
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Preparation and Installation.

1650880	Insituform Technologies, LLC Installation - Western Region 91-255 Kalaeloa Blvd. Kapolei , Hawaii USA	March 15, 2017
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Preparation and Installation.

These registrations are dependent on Insituform Technologies, LLC
Headquarters (File No. 1650845) maintaining their scope of registration to
ISO 9001:2015

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

1650881	Insituform Technologies, LLC Installation - Western Region 17220 Bel Ray Place Belton , Missouri USA Preparation and Installation.	March 15, 2017
1650882	Insituform Technologies, LLC Installation - Western Region 1088 Victory Drive Howell , Michigan USA Preparation and Installation.	March 15, 2017
1650883	Insituform Technologies, LLC Installation - Western Region 11351 W. 183rd Orland Park , Illinois USA Preparation and Installation.	March 15, 2017
1650884	Insituform Technologies, LLC Installation - Western Region 1177 Birch Lake Blvd. N. White Bear Lake , Minnesota USA Preparation and Installation.	March 15, 2017
1650885	Insituform Technologies, LLC Installation - Western Region 2130 Stout Field West Drive Indianapolis , Indiana USA Preparation and Installation.	March 15, 2017
1650886	Insituform Technologies, LLC Installation - Canadian Region 8009 57th Street SE Unit 4 Calgary , Alberta Canada Preparation and Installation.	March 15, 2017
1650887	Insituform Technologies, LLC Installation - Canadian Region 139 rue Barr Montreal , Québec Canada Preparation and Installation.	March 15, 2017
1650888	Insituform Technologies, LLC Installation - Canadian Region 3 Burford Rd. Hamilton , Ontario L8E 3C6 Canada	March 15, 2017

These registrations are dependent on Insituform Technologies, LLC
Headquarters (File No. 1650845) maintaining their scope of registration to
ISO 9001:2015

ATTACHMENT TO CERTIFICATE OF REGISTRATION

These sites are registered under Certificate No: CERT-0101077 issued on March 8, 2018

Preparation and Installation.

1680743

Insituform Technologies, LLC

March 15, 2017

19165 SW 119th Street Tualatin , Oregon 97062-7384 USA

Preparation and Installation

These registrations are dependent on Insituform Technologies, LLC
Headquarters (File No. 1650845) maintaining their scope of registration to
ISO 9001:2015

INSITUFORM® CIPP

Affordable, reliable and non-disruptive solutions for sewer pipe reconstruction



Our Trenchless Solution

The Insituform® cured-in-place pipe (CIPP) is a jointless, seamless, pipe-within-a-pipe used to rehabilitate sanitary sewers, storm sewers and force mains.

Insituform® CIPP addresses your top concerns:

Infiltration reduction. Water entering your sewer system through cracks, holes and joint failures can overload your treatment facilities, especially during wet weather. Insituform® CIPP significantly reduces this infiltration. In dry climates, roots find the sewer system an attractive source of water and nutrients and create blockages and overflows. Insituform® CIPP contains your flow within the pipe while keeping external water and roots out.

Structural integrity. Insituform® CIPP restores structural integrity to your damaged sewer pipes. The design models used, independent test results and over 40 years of service all confirm that Insituform® CIPP is a structural product with a 100-year design life.

Increased flow capacity. Insituform® CIPP provides the least cross-sectional reduction of all methods used to rehabilitate pipes. There are no joints or seams that can separate over time and the smooth, jointless interior provides excellent abrasion resistance and typically improves flow capacity.

Affordability. The Insituform® CIPP process is usually less expensive than conventional dig and replace methods of sewer repair. When the lost business revenues, traffic congestion and social costs associated with other methods are considered, your savings are immeasurable.

Installation flexibility. Insituform® CIPP can be installed using either air or water inversion, or by pulling into place. The cure can be done with steam or hot water. All processes are consistent with nationally recognized standards and Insituform's own ISO-certified quality control program. Since each job is unique, we apply the most cost-effective, technically optimal solution to meet your pipeline rehabilitation needs.



INSITUFORM® CIPP

Insituform® CIPP is the best choice for trenchless rehabilitation.

Insituform superior processes

Since inventing CIPP over 40 years ago, Insituform has developed the highest quality manufacturing and installation systems in the trenchless industry.

As a vertically integrated company, we take responsibility for research and development, manufacturing, installation and service. Our systems are designed to produce consistency and high performance in our products and services.

Manufacturing

Insituform's patented manufacturing capabilities are certified to the ISO 9001:2008 standard, ensuring that our tubes are constructed for optimal long-term performance. During the manufacturing process, each tube goes through 25 separate quality checks.

Wet out

Insituform's resin impregnation process ensures that Insituform® CIPP achieves the required strength and enables wet out of many lengths, diameters and thicknesses.

Insituform's wet out facilities utilize environmentally friendly methods and equipment. In fact, Insituform has been recognized by the United States' Environmental Protection Agency for efforts to protect the environment at its various wet out facilities.

Installation

Every Insituform installation is completed using our own safety-certified crews who follow strict safety procedures and documented work practices. Each crew is equipped with highly specialized equipment, backup resources and engineering support.

Insituform's advanced installation methods include air invert steam cure, which reduces water usage on a job site by approximately 95% and energy usage by 75%.

Transportation Solutions

Insituform offers affordable, trenchless solutions to renew and extend the life of underground stormwater control and drainage structures. A large number of culverts running under the nation's roadways are approaching or have exceeded their expected design life. A culvert or storm sewer pipe collapse can have catastrophic effects on the traveling public, your budget and your credibility. Insituform can help you avoid the direct costs and the social costs of a failure by proactively renewing your underground assets.

For transportation projects, particularly culverts, Insituform uses installation methods that minimize the use of water and maximize resin containment, thus protecting downstream waters from contamination.

The Insituform® CIPP Installation Process



Step 1:

A resin-saturated, coated felt tube is inverted (shown) or pulled into a damaged pipe.



Step 2:

Hot water or steam is used to cure the resin and form a tight-fitting, jointless and corrosion-resistant replacement pipe.



Step 3:

Service laterals are restored internally with robotically controlled cutting devices and the rehabilitated pipe is inspected by closed-circuit TV.

The Insituform® CIPP Technical Envelope

The Insituform® CIPP Technical Envelope

Diameter range	4 in. – 124 in.*
pH range	0.5 – 10.5
Effluent temperature	up to 140° F
Pipe condition — fully deteriorated	Yes
Pipe condition — partially deteriorated	Yes
Bends	Yes
Offset joints	Yes
Diameter changes	Yes, without manhole access
Thickness changes	Yes, without manhole access
Typical shot length	200 ft.– 1000 ft.
Host pipe shape	All shapes
Host pipe material	All materials

* Thickness and length limitations in larger diameters

This table refers to general purpose municipal sewer CIPP projects. Insituform can provide products that extend beyond these parameters through our engineering group. Please contact your local representative at 800.234.2992 for assistance with applications extending beyond this technical envelope.



AEGION®

Stronger. Safer. Infrastructure.®



Insituform

Insituform Technologies, LLC
17988 Edison Avenue
St. Louis, MO 63005
800.234.2992
www.insituform.com



BLD “Service Connection Seal + Lateral” Full Wrap Style Process

Important Note: This submittal contains confidential information to BLD Services, LLC. Nothing, whole or in part, shall be reproduced without prior written consent from an authorized executive of BLD Services, LLC.

Manufactures Qualifications & Installation Process

BLD Services, LLC offers the following data in support of our manufacture’s qualifications and installation process:

Manufacturer’s Qualifications

Manufacturer’s license certificate – BLD Services, LLC manufactures the product at our manufacturing facility by combining the CIPP lateral liner supplied by an ISO 9001 certified manufacturer and a resin system supplied by an ISO 9001 certified resin manufacturer to create a Cured-In-Place Pipe lateral system that provides a water-tight seal at the main and a structural, watertight repair up the lateral. BLD Services is the manufacturer and installer of our CIPP lateral liner and do not license contractors for the installation of our product.

BLD ensures liner quality and consistency by having the full-wrap and lateral material assembled at our manufacturing facility in Nashville, TN. The CIPP lateral liner and full-wrap sheet are attached via a stitched seam and sealed for superior strength. In addition, we die punch the backing rings to defined dimensions and attach to the full-wrap sheet per the required connection configuration containing a pocket size that insures the proper hydrophilic material volume is present during installation. 100% of the lateral liners are vacuum tested prior to installation to insure a water-tight seal. The wet-out process takes place onsite by vacuum impregnating the liner with resins manufactured by the approved, ISO 9001 certified manufacturer, Alpha Owens Corning (AOC). The resin saturated liner passes through an engineered rolling system with defined, calibrated gap settings to insure 100% of the liner is resin saturated prior to installation.

The 4-6” felt CIPP materials are purchased from an approved, ISO 9001 certified CIPP liner manufacturer:

Installation Guidelines: The following data contains proprietary information.



The general sequence followed for the installation of the Service Lateral Connection (SLC) seal is as follows:

1. Setup traffic control as required
2. Equipment setup at the upstream and downstream manholes
3. Bypass pumping equipment setup (as required)
4. Plugs and suction/discharge hoses placed in the appropriate locations
5. CCTV inspection of the mainline sewer and applicable laterals
6. Cleaning of the lateral sewers as required
7. CCTV inspection of the lateral sewers to ensure they have been adequately cleaned
8. Additional cleaning, if required, followed by final pre-lining CCTV inspection
9. Manufacture of the dry felt liner on site
10. Wet-out of the SLC CIPP liner on site
11. Placement of the SLC CIPP liner into the installation train
12. Position the installation train in the pipe
13. Move the installation train to the appropriate lateral connection
14. Inflate the main line bladder
15. Invert the lateral bladder up the lateral connection
16. Hold in place until curing times have been met or exceeded
17. De-invert the lateral bladder and deflate the main line bladder
18. Remove the installation train from the pipeline
19. CCTV inspect the main line at the connection and the lateral liner
20. Repeat steps 9-18 as required for each lateral connection

The details pertaining to each of the steps listed above are proprietary in nature. These proprietary details are as follows:

1. Set-up:
 - a. Position equipment.
 - b. Set-up adequate traffic control for the conditions present, establishing a defined workspace.
 - c. Clean the mainline with the cleaning unit.
 - d. Video the mainline with the CCTV truck, noting the location, size, type, and length of the service lateral that is being rehabilitated. Care must be taken to note any abnormalities on the CCTV log of the service, i.e. overcut, undercut, infiltration, heavy flow through the service that may require custom modifications of the SCS+L and/or curing time. Note: the inspection operator shall be trained and certified by NASSCO to meet the requirements of the PACP and LACP inspections criteria. All inspections, pre and post installation, will be conducted and documented per PACP and LACP guidelines.
 - e. Prep Connection (as required)
 - i. Brush connection if not cut properly
 - f. Prep Lateral Line without cleanout/access point – from mainline (as required)
 - i. Clean and remove all loose debris
 - ii. De-root (as required)
 - iii. TV-Lateral Launching (if required, or pan and tilt from main line)



- iv. Determine the lateral length required for rehabilitation.
 - g. Prep Lateral Line with cleanout/access point (as required)
 - i. Clean and remove all loose debris
 - ii. De-root
 - iii. TV-push camera
 - iv. Determine the lateral length required for rehabilitation.
 - h. Set-up, test and verify size of rotational alignment device to correlate with mainline then position into mainline.
 - i. Set-up safety items for Confined Space Entry.
 - j. Set-up Staging Area
 - i. Tarp to protect installation device (silicone bladder installation lateral train) from abrasions and contain excess resin while loading lateral train.
 - ii. Portable shade device if no shade is available to protect lateral train from sun.
 - iii. Restraining device (girdle) to restrain mainline silicone bladder from over expanding while loading.
- 2. Train Preparations:
 - a. Select appropriate train assembly for the size and length of lateral to be rehabilitated.
 - b. Attach a radial view camera via a camera saddle to the lateral train for alignment purposes.
 - c. Connect airline to rear of lateral train. Connect winch cable to installation hose then apply enough air pressure to invert the inversion silicone bladder. Once the inversion silicone bladder has inverted, maintain minimal pressure and clean the inversion silicone bladder if necessary, with a clean cloth soaked in Acetone. Check the inversion and mainline silicone bladder for leaks, repair if necessary.
 - d. Lubricate inversion silicone bladder, deplete air pressure then retract inversion silicone bladder back into the lateral train assembly assuring that the bladder doesn't bunch up in the process.
- 3. Prepare tube for Wet-Out:
 - a. Seal the end of the tube so that a vacuum can be applied.
 - b. Cut a slit in coating of tube in the center two inches from sealed end and circle the slit with felt marker to establish a vacuum port. (This section of the full-wrap will be cut-off and discarded after wet-out and prior to installation)
 - c. Measure from side of tube at collar to required length of tube to be installed. With a straight edge draw a line across the tube.
- 4. Resin/Chemical Preparation:
 - a. Weigh out required amount of resin in a bucket with a clean bucket liner.
 - b. Weigh out required amount of peroxide (BPO), add to the resin and mix for approximately two minutes.
 - c. Weigh out required amount of thickening agent (MGO) and set aside.
 - d. Evaluate ground, air and resin temperatures, any abnormalities of the service noted on the CCTV Log and anticipated difficulty of installation to determine desired pot life.
 - e. Weigh out required amount of catalyst (DEA/DMA) as determined in "D" above and set aside.
- 5. Resin Mixing and Wet-Out:
 - a. Add thickening agent (MGO) to resin (as required).
 - b. Record the time on the wet-out/curing log.



- c. Add blue dye to the catalyst (DEA) and then add to the resin. Start a timer upon adding the DEA to the resin. Mix for approximately two minutes. Ensure a blue consistency of the resin mix providing evidence of thorough mixing of the chemical components.
 - d. Attach vacuum cup to the previously prepared vacuum port.
 - e. Pour resin mixture into the lateral tube. Wet-out the entire lateral tube and full wrap moving resin slug towards vacuum port.
 - f. Remove the vacuum cup before resin is absorbed into the vacuum system.
 - g. Cut the lateral tube at the predetermined length marked. Cut the sample & test piece from remainder of tube, place in the shade for final preparation.
 - h. Transport SCS+L to the lateral train staging area.
6. Loading:
 - a. Place the wet out SCS+L over the lateral train mainline silicone bladder ensuring that the lateral tube is centered over the inversion silicone bladder.
 - b. Invert the inversion silicone bladder through the tube by applying the minimum required air pressure.
 - c. Stop the inversion silicone bladder when it has extended approximately 12" beyond the end of the lateral tube.
 - d. Reduce the air pressure and slowly pull back on the installation hose.
 - e. As the inversion silicone bladder nears the end of the lateral tube, tuck the corners of the lateral tube into the de-inverting inversion silicone bladder as the installation hose is slowly pulled back. As the lateral tube/inversion silicone bladder nears the mainline silicone bladder taking caution that the tube is not pulled too tight.
 - f. Wipe off any excess resin from lateral train assembly.
 - g. Apply a hydrophilic material around the lateral tube and across the opening of the lateral tube. **See attached Adeka Specifications*
 - h. Apply Silicate Resin to the entire surface area of the full-wrap sheet to increase adhesion. **See attached Silicate Resin Specifications*
7. Inserting SCS+L into mainline:
 - a. Transport loaded lateral train assembly to downstream manhole.
 - b. Lower the loaded lateral train assembly into manhole with the mainline silicone bladder end first.
 - c. Lower a lateral lining technician into manhole.
 - d. The lateral lining technician will attach the lateral train assembly to the lateral train rotational alignment device and the radial view camera to video cable.
 - e. With the SCS+L facing 12 o'clock the CCTV Operator slowly takes up the slack pulling the lateral train assembly into the mainline ensuring that the assembly does not twist nor does the full wrap fold.
 - f. Continue to feed lateral train into manhole/mainline until rear of lateral train is in mainline, stop pulling and remove the lateral lining technician from manhole.
 - g. As the CCTV Operator pulls lateral train assembly, downstream personnel will continue to feed slack on-air line and installation hose/cable until the SCS+L reaches the service to be rehabilitated.
8. Inversion:
 - a. CCTV Operator pulls the lateral train assembly passed the connection to be rehabilitated, approximately one foot. The lateral train assembly will then be pulled back toward the downstream, as the CCTV Operator rotates the lateral train assembly via the rotational



- b. alignment device to align the SCS+L. The black-tie strap that was attached to lateral tube during tube preparation will be used as a guide to center the SCS+L in the connection.
- c. Once the lateral train assembly is in place the installation hose/cable is marked for the length of the SCS+L being installed. The cable reel is locked to prevent the inversion silicone bladder from going beyond the required distance.
- d. The CCTV Operator will communicate to the downstream personnel that the lateral train assembly is lined up and to apply air pressure to the lateral train to invert the SCS+L. Once the mainline silicone bladder is fully inflated the inversion hose/cable should be released, allowing SCS+L to be inverted into the lateral line.
- e. **NOTE: If the inversion has not been completed within the predetermined pot life of the resin, it may be deemed necessary to abort the installation.**
- f. Once the inversion is completed, allotted distance of installation hose/cable is pulled taut; the air pressure should be lowered to the hold pressure.
- g. The sample of the lateral tube should be attached to a rope and lowered into the downstream manhole ensuring that it is not exposed to direct sunlight nor allowed to come in contact with water in the manhole.
- h. The test piece is placed in a clamp mold calibrated for the designed thickness and lowered into the downstream manhole ensuring that it is not exposed to direct sunlight nor allowed to come in contact with water in the manhole, as required.

9. Curing:

- a. Curing is achieved with an ambient cure resin system. The cure time is approximately 30 – 60 minutes.
- b. Lateral lining technician will monitor the air pressure throughout the cure cycle.
- c. Lateral lining technician will monitor the sample that is suspended in the manhole to observe when the exotherm begins. The times of each curing stage are recorded on the wet-out cure log.
- d. Once the sample has cured, the air pressure should be maintained for approximately 15 – 30 minutes depending on ground water, infiltration, etc.
- e. **NOTE: Pay close attention to any abnormalities of the service noted on the CCTV Log.**

10. Train Removal/Retraction:

- a. Open the pressure relief valve. While air pressure is bleeding off ensure that the CCTV winch is in gear then pull back on the installation hose/cable pulling the inversion silicone bladder down into the lateral train assembly.
- b. With the radial view camera on the lateral train assembly, confirm the newly rehabilitated SCS+L is complete.
- c. Take the CCTV winch out of gear and pull the lateral train assembly back to the downstream manhole.
- d. Lower a lateral lining technician into manhole to disconnect the lateral train assembly from the rotational alignment device.
- e. Remove lateral lining technician from manhole.
- f. Remove the lateral train assembly from manhole and transport the lateral train to the Staging Area. Prep the lateral train assembly for the next installation as previously described in Set-up section above.

11. Post-Installation Video:

- a. Mainline - Post video inspection of mainline while radial viewing newly rehabilitated connections.



NOTE: If SCS+L can be viewed from the mainline post video inspection, no additional video is required.

- b. Lateral line without cleanout – Post video inspection using lateral launching camera
- c. Lateral line with cleanout – Post video inspection using lateral push camera

PROJECT APPROACH - CLEANING



Depending on the scope of the project, Insituform self-performs a variety of the percentage of trenchless projects as a Prime Contractor - generally between 40-90%. Our experienced crews and personnel self-perform all of the CIPP main line lining and subcontract the majority of other scopes, including cleaning/CCTV, grouting, manhole rehabilitation, lateral lining, and excavated repairs within our trusted network of quality subcontractors.

Since Insituform came to market in 1971 with the invention of cured-in-place-pipe, we've developed a robust network of cleaning and televising subcontractors that work hand-in-hand with us. Locally, we've been fortunate to work for several subcontractors, with relationships spanning over a decade.

Our approach to the cleaning portion of the project is to lean on our proven subcontractors to carry out the storm and sanitary sewer cleaning and closed-circuit televising (CCTV) scopes. Our subcontractors have extensive experience, are reliable and have successfully performed rehabilitation projects throughout the Southeast. They have the knowledge of the pipe, soil, and groundwater conditions found in the area, are familiar with staff and area resources, as well as experience with local dump sites and regulations. Our network of subcontractors are skilled using a variety of condition assessment technologies and formats, and will work with both Insituform and the City to ensure that video formats are high in quality, are consistently and correctly formatted, and carry any/all proper certifications (i.e. PACP, LACP, MACP, etc.). Based on this familiarity and experience, there are no product restraints or restrictions.

For this project, Insituform is pleased to submit the qualifications of the following subcontractors to fulfill the cleaning & televising scope of services required, all of whom we've worked with extensively throughout the State of Florida:

PROLINE VACTOR SERVICES, INC.
P.O. Box 541149
Lake Worth, FL 33454

UNITED PIPELINE REHABILITATION
SERVICES, INC. (UPR)
P.O. Box 178
Patterson, Ga. 31557



To whom it may Concern,

The following is a brief background on Proline Vactor Services, Inc.. We have been in the sewer rehabilitation business since our incorporation in 1998. Currently we employ 24 employees. The company is a certified Perma Liner Point repair system installer as well as the NuFlow LCL Lateral system. Proline since its inception has rehabilitated countless miles of sanitary sewer as well as drainage pipes and manholes. We are a full service company everything is in house we do not use sub contractors. Proline's employees have all been either certified or re-certified for confined space entry. Our trucks are equipped with the most up to date safety equipment to meet OSHA standards. At present we are currently working on numerous sewer rehabilitation projects for Insituform Technologies, Inc. throughout South Florida. Our equipment list is as follows:

- 3 Aries Television/Grout trucks
- 3 Aries Television trucks
- 6 Combination Sewer Cleaner Trucks 3 Vac-Con's, 3 Vactor's
- 2 Sewer Jetter trailer
- 1 Sewer Jet Truck
-

The Following is Our Employee Profiles:

- **Todd Blum** –Owner/President since inception Todd is a state licensed Underground Utility Contractor . I have been in the underground infrastructure business since 1988 . I am heavily involved in the managing of all of Proline's Operations.
- **Douglas Blum** has been employed at Proline from 2001 to present. Doug is a TV operator he is also a certified installer for the Perma Liner point repair system, Also he is certified for the NuFlow LCL Lateral Installation .
- **Samson Barriner** has been employed at Proline from 1999 to present . Sam has been in the sewer rehabilitation industry for over 20 years. Sam is currently a TV truck operator he also is a certified installer for the Perma Liner point repair system as well as the NuFlow LCL Lateral system.
- **Jonathan Blum** TV truck operator
- **Peter Aleman** TV Truck Operator
- **Jeff Faffata** Vac truck operator
- **Weatherington Hobbs** Vac Truck Operator
- **Anthony Weaver** Vac Truck Operator
- **Ken Khaleel** Vac truck Operator
- **Kevin Weuntzel** Vac truck operator
- **Robert Alexander** Vac Truck Operator
- **Roger McFadden** Vac Truck Operator

Please also visit our web site at www.proline-vactor.com for any additional information relating to the services we offer here at Proline.

The following will serve as a brief list of similar work that Proline has been performing since 1998. We have been a subcontractor for Insituform Technologies Inc. since January of 1999. Which is well known in the industry for being a worldwide provider for sewer and drainage rehabilitation. Proline has and continues to perform 80% of there cleaning and televising work in south Florida. Most of our contracts have been with Insituform and not directly with the cities themselves however we are well known in all of these cities for the work that we provide.

Insituform Technologies - Contact Frank Kendrix 813-299-6320
Brandt Curvel 904-838-0090

Annual Projects that we provide services for each year are as follows.

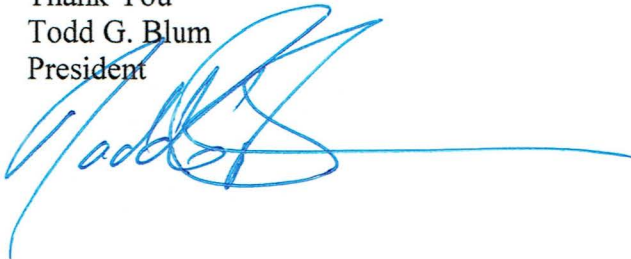
City of Oakland Park		954-347-2888	(over 250,000
LF Televised)			
City of Melbourne	Contact Matt Bush	321-288-7783	
City of North Miami Beach	Contact Pedro	954-243-9769	
-City of Boynton Beach	Contact George Peck	561-503-0113	
-City of Plantation	Contact Dan Pollio	954-797-2159	
-City of Ft Lauderdale	Contact Tren Owens	954-561-9197	
-City of Hollywood	Contact Chuck Dishner	954-921-3930	
-City of Pompano Beach			
-City of Hialeah			
-City of Margate			

- Miami Dade County
- City of West Palm Beach
- City of Tamarac
- City of Riviera Beach
- Town of Palm Beach

The following are Contractors that we continually provide service to:

- | | | |
|------------------------|---------------------------|--------------|
| - Pines Property Mgmt. | Contact Tom Evans | 954-438-6570 |
| -H & J Contracting | Contact: Carmen McCartney | 561-441-6043 |
| -Trio Development | Contact: Larry Shortz | 954-444-5399 |
| -Pipeline Utilities | Contact: Ron Johnson | 561-842-8833 |
| -DS Eakins | Contact: Steve Eakins | 561-722-9164 |
| -URS Corporation | Contact: Earl | 561-756-6063 |
| -JW Cheatham LLC | Contact: Steve Cheatham | 561-471-4100 |
| -SiteWorks Inc. | Contact: Gary Bal | 561-756-4719 |

Thank You
Todd G. Blum
President





DATE: 2/27/2020

TO: City of St. Augustine, FL
ATTN: To Whom It May Concern

RE: RFP No. PW2020-06 Sanitary Sewer Cleaning, Inspection
SUBJ: UPR Background

Underground Pipeline Rehabilitation, Inc. (UPR) has been in business since 1999 and works primarily in the Southeast United States. The majority of work performed by UPR is for Insituform Technologies in the North Florida and South Georgia market. During the last 20 years, UPR has performed many services which include pipeline cleaning, CCTV inspection, point repairs, open cut, manhole replacement/installation, clean out installation and pipe bursting with HDPE. UPR understands safety is first and has performed hundreds of projects with Insituform with minimal or no safety infractions. UPR and Insituform have worked on countless projects in coastal areas and are well experienced with any issues that may arise with coastal pipeline rehabilitation. Given the opportunity, we look forward to working with Insituform and the City of St. Augustine for the next few years. Please feel free to contact me if you need any additional information.

Sincerely,

Rodney N. James
Underground Pipeline Rehabilitation, Inc. (UPR)
(912) 647-0942 (Office)
(912) 288-0392 (Cell)

TAB 6: COST EFFECTIVENESS



Insituform[®]
an AEGION[™] company

ATTACHMENT #1
REVISED UNIT COST SCHEDULE (SECOND REVISION 02/27/2020)

City of St. Augustine Florida				
Cleaning, Closed Circuit Televising, and Lining Sanitary Sewers				
Unit Price Schedule				
Item	Description	Approximate Qty.	Unit	Unit Cost
Cleaning and Inspection of Sanitary Sewers				
Light Cleaning				
LC1	Lateral Service from Main	5	0 to 40 Ft.	\$167.50
LC2	Lateral Service from Main	5	≥ 40 Ft.	\$55.80
LC3	Lateral Service from Cleanout	5	0 to 40 Ft.	\$167.50
LC4	Lateral Service from Cleanout	5	≥ 40 Ft.	\$55.80
LC5	6" Diameter	500	LF	\$3.20
LC6	8" and 10" Diameter	5000	LF	\$2.40
LC7	12" Diameter	800	LF	\$3.20
LC8	15" Diameter	100	LF	\$5.00
LC9	16" Diameter	100	LF	\$7.10
LC10	18" Diameter	100	LF	\$8.40
LC11	20" Diameter	50	LF	\$9.50
Medium Cleaning				
MC1	Lateral Service from Main	5	0 to 40 Ft.	\$167.50
MC2	Lateral Service from Main	5	≥ 40 Ft.	\$55.80
MC3	Lateral Service from Cleanout	5	0 to 40 Ft.	\$167.50
MC4	Lateral Service from Cleanout	5	≥ 40 Ft.	\$55.80
MC5	6" Diameter	500	LF	\$3.70
MC6	8" and 10" Diameter	5000	LF	\$2.90
MC7	12" Diameter	800	LF	\$3.70
MC8	15" Diameter	100	LF	\$5.60
MC9	16" Diameter	50	LF	\$7.70
MC10	18" Diameter	50	LF	\$9.00
MC11	20" Diameter	50	LF	\$10.10
Heavy Cleaning				
HC1	Lateral Service from Main	5	0 to 40 Ft.	\$167.50
HC2	Lateral Service from Main	5	≥ 40 Ft.	\$55.80
HC3	Lateral Service from Cleanout	5	0 to 40 Ft.	\$167.50
HC4	Lateral Service from Cleanout	5	≥ 40 Ft.	\$55.80
HC5	6" Diameter	1000	LF	\$4.20
HC6	8" and 10" Diameter	6000	LF	\$3.40
HC7	12" Diameter	2000	LF	\$4.20

HC8	15" Diameter	100	LF	\$6.10
HC9	16" Diameter	50	LF	\$8.20
HC10	18" Diameter	50	LF	\$9.50
HC11	20" Diameter	50	LF	\$10.50
Protruding Taps Removal				
CT1	6" Diameter	1	EA	\$390.90
CT2	8" Diameter	50	EA	\$223.40
CT3	10" Diameter	50	EA	\$251.30
CT4	12" Diameter	50	EA	\$279.20
CT5	15" Diameter	1	EA	\$390.90
CT6	16" Diameter	1	EA	\$418.80
CT7	18" Diameter	1	EA	\$446.80
CT8	20" Diameter	1	EA	\$502.60
Root Removal				
RC1	Service Lateral from Main	200	LF	\$5.60
RC2	Service Lateral from Cleanout	100	LF	\$5.60
RC3	6" Diameter	300	LF	\$1.10
RC4	8" Diameter	4000	LF	\$1.10
RC5	10" Diameter	1000	LF	\$1.30
RC6	12" Diameter	800	LF	\$1.40
RC7	15" Diameter	100	LF	\$2.20
RC8	16" Diameter	50	LF	\$3.90
RC9	18" Diameter	50	LF	\$4.20
RC10	20" Diameter	50	LF	\$5.60
Root Treatment				
RT1	Service Lateral from Main	50	LF	\$5.60
RT2	Service Lateral from Cleanout	50	LF	\$5.60
RT3	6" Diameter	300	LF	\$1.90
RT4	8" Diameter	4000	LF	\$1.90
RT5	10" Diameter	1000	LF	\$2.10
RT6	12" Diameter	800	LF	\$2.30
RT7	15" Diameter	100	LF	\$3.20
RT8	16" Diameter	50	LF	\$3.20
RT9	18" Diameter	50	LF	\$4.50
RT10	20" Diameter	50	LF	\$5.60
Tuberculation Cleaning				
DS1	Service Lateral from Main	100	LF	\$16.80
DS2	Service Lateral from Cleanout	100	LF	\$16.80
DS3	6" Diameter	200	LF	\$17.90
DS4	8" Diameter	2000	LF	\$17.90

DS5	10" Diameter	1000	LF	\$18.40
DS6	12" Diameter	1000	LF	\$18.70
DS7	15" Diameter	300	LF	\$24.00
DS8	16" Diameter	50	LF	\$24.00
DS9	18" Diameter	50	LF	\$26.20
DS10	20" Diameter	50	LF	\$30.70
CCTV Inspection				
TV1	Lateral Service from Main	<u>300</u>	0 to 40 Ft	\$167.50
TV2	Lateral Service from Main	5	<u>> 40 Ft</u>	\$55.80
TV3	Lateral Service from Cleanout	50	0 to 40 Ft	\$167.50
TV4	Lateral Service from Cleanout	5	<u>> 40 Ft</u>	\$55.80
TV5	6" Diameter	3000	LF	\$1.40
TV6	8" and 10" Diameter	10000	LF	\$1.40
TV7	12" Diameter	1500	LF	\$1.40
TV8	15" Diameter	100	LF	\$1.70
TV9	16" Diameter	100	LF	\$1.70
TV10	18" Diameter	150	LF	\$2.20
TV11	20" Diameter	50	LF	\$3.40
General Services				
By-Pass Pumping				
BP1	6" Diameter Main	1	LF	\$2.20
BP2	8" Diameter Main	500	LF	\$2.20
BP3	10" Diameter Main	3000	LF	\$2.20
BP4	12" Diameter Main	1000	LF	\$4.50
BP5	15" Diameter Main	100	LF	\$22.30
BP6	16" Diameter Main	100	LF	\$22.30
BP7	18" Diameter Main	100	LF	\$25.70
BP8	20" Diameter Main	50	LF	\$36.90
Plug Installation & Removal (Includes Minimum Weekly Rental) for:				
P1	4" To 8" Diameter Main	20	Week	\$11.20
P2	8" to 16" Diameter Main	20	Week	\$16.80
P3	12" To 24" Diameter Main	20	Week	\$111.70
Sanitary Sewers Renewal				
Sanitary Main CIPP Lining				
L1a	6" Diameter, 4.5mm Nominal thickness with end seals	2000	LF	\$30.40
L1b	Price for each 1.5mm thickness increase exceeding 4.5mm, 6"	1	LF	\$5.60

	Diameter			
L2a	8" Diameter, 6mm nominal thickness with end seals	5000	LF	\$24.00
L2b	8" Diameter, 7.5mm nominal thickness with end seals	3000	LF	\$26.10
L2c	Price for each 1.5mm thickness increase exceeding 7.5mm, 8" diameter	1	LF	\$2.20
L3a	10" Diameter, 6mm nominal thickness with end seals	4000	LF	\$28.30
L3b	10" Diameter, 7.5mm nominal thickness with end seals	2000	LF	\$30.60
L3c	Price for each 1.5mm thickness increase exceeding 7.5mm, 10" diameter	1	LF	\$2.80
L4a	12" Diameter, 6mm nominal thickness with end seals	2000	LF	\$31.40
L4b	12" Diameter, 7.5mm nominal thickness with end seals	1000	LF	\$33.90
L4c	Price for each 1.5mm thickness increase exceeding 7.5mm, 12" diameter	1	LF	\$3.40
L5a	15" Diameter, 6mm nominal thickness with end seals	300	LF	\$38.10
L5b	15" Diameter, 7.5mm nominal thickness with end seals	200	LF	\$51.60
L5c	Price for each 1.5mm thickness increase exceeding 7.5mm, 15" diameter	1	LF	\$3.90
L6a	16" Diameter, 7.5mm nominal thickness with end seals	200	LF	\$52.20
L6b	16" Diameter, 9mm nominal thickness with end seals	200	LF	\$64.30
L6c	Price for each 1.5mm thickness increase exceeding 9mm, 16" diameter	1	LF	\$4.50
L7a	18" Diameter, 7.5mm nominal thickness with end seals	150	LF	\$58.70
L7b	18" Diameter, 9mm nominal thickness with end seals	150	LF	\$67.60
L7c	Price for each 1.5mm thickness increase exceeding 9mm, 18" diameter	1	LF	\$5.60

L8a	20" Diameter, 10.5mm nominal thickness with end seals	100	LF	\$91.80
L8b	20" Diameter, 12mm nominal thickness with end seals	100	LF	\$99.90
L8c	Price for each 1.5mm thickness increase exceeding 12mm, 20" diameter	1	LF	\$6.70
L9a	8" & 10" Main, 4" Lateral reinstatement	50	EA	\$104.80
L9b	8" & 10" Main, 6" Lateral reinstatement	300	EA	\$104.80
L9c	12" Main, 6" Lateral reinstatement	200	EA	\$104.80
L9d	15" Main, 6" Lateral reinstatement	10	EA	\$250.00
L9e	16" Main, 6" Lateral reinstatement	10	EA	\$250.00
L9f	18" Main, 6" Lateral reinstatement	5	EA	\$300.00
L10a	6" Pre-Liner Installation	1000	LF	\$1.50
L10b	8" Pre-Liner Installation	2000	LF	\$1.90
L10c	10" Pre-Liner Installation	1000	LF	\$2.40
L10d	12" Pre-Liner Installation	1000	LF	\$2.60
L10e	15" Pre-Liner Installation	300	LF	\$2.80
L10f	16" Pre-Liner Installation	200	LF	\$3.00
L10g	18" Pre-Liner Installation	150	LF	\$3.20
Sanitary Sewer Service Lateral CIPP Lining				
LL1a	6" <u>diameter Lateral</u> , One-piece main/lateral connection, <u>nominal 4.5 mm</u> , with a <u>16"</u> main and lateral insertion not to exceed 20 feet both with end seals.	300	EA	\$3,183.20
LL1b	6" <u>diameter Lateral</u> , one-piece main/lateral connection price for each additional foot that is inserted into lateral beyond 20 feet.	100	LF	\$55.80
LL2a	6" <u>diameter lateral lining</u> , 4.5mm nominal thickness with end seals	200	LF	\$83.80
LL2b	Price for each <u>1.5 mm</u> thickness increase exceeding <u>.5 mm</u> nominal, <u>6"</u> diameter	1	LF	\$27.90

LL3a	4" <u>diameter lateral lining, 4mm nominal thickness with end seals</u>	200	LF	\$83.80
LL3b	<u>Price for each 1 mm thickness increase exceeding 4 mm nominal, 4" diameter</u>	<u>1</u>	<u>LF</u>	\$27.90
LL3c	Price for each 1.5 mm thickness increase of the One-piece main/lateral connection (LL1a) exceeding 4.5 mm nominal, 6" diameter	1	<u>EA</u>	\$111.70
LL4a	<u>4" diameter Lateral, One-piece main/lateral connection, nominal 4 mm, with a 16" main and lateral insertion not to exceed 20 feet both with end seals</u>	<u>100</u>	<u>EA</u>	\$3,183.20
LL4b	<u>Price for each 1 mm thickness increase of the One-piece main/lateral connection (LL4) exceeding 4 mm nominal, 4" diameter</u>	<u>1</u>	<u>EA</u>	\$111.70
Sanitary Sewer Sectional CIPP Lining				
SL1	6" Diameter, 4.5mm nominal with end seals typical			
1a	3 Foot Section	1	EA	\$2,233.80
1b	6 Foot Section	1	EA	\$2,680.60
1c	10 Foot Section	1	EA	\$2,904.00
SL2	8" Diameter, 6mm nominal with end seals typical			
2a	3 Foot Section	1	EA	\$2,680.60
2b	6 Foot Section	1	EA	\$3,015.70
2c	10 Foot Section	1	EA	\$3,350.70
SL3	10" Diameter, 6mm nominal with end seals typical			
3a	3 Foot Section	1	EA	\$2,904.00
3b	6 Foot Section	1	EA	\$3,239.00
3c	10 Foot Section	1	EA	\$3,574.10
SL4	12" Diameter Sewer, 6mm nominal with end seals typical			
4a	3 Foot Section	1	EA	\$3,574.10

4b	6 Foot Section	1	EA	\$4,244.30
4c	10 Foot Section	1	EA	\$4,691.00
4x	Price for each 1.5mm thickness increase exceeding 6mm	1	EA	\$837.70
SL5	15" Diameter, 7.5mm nominal with end seals typical			
5a	3 Foot Section	1	EA	\$4,132.60
5b	6 Foot Section	1	EA	\$4,691.00
5c	10 Foot Section	1	EA	\$5,249.50
5x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	\$949.40
SL6	16" Diameter, 7.5mm nominal with end seals typical			
6a	3 Foot Section	1	EA	\$4,244.30
6b	6 Foot Section	1	EA	\$4,802.70
6c	10 Foot Section	1	EA	\$5,361.20
6x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	\$949.40
SL7	18" Diameter, 7.5mm nominal with end seals typical			
7a	4 Foot Section	1	EA	\$5,584.60
7b	8 Foot Section	1	EA	\$6,366.40
7c	10 Foot Section	1	EA	\$7,148.20
7x	Price for each 1.5mm thickness increase exceeding 7.5mm	1	EA	\$1,340.30
SL8	20" Diameter, 10.5mm nominal with end seals typical	1	EA	0
8a	4 Foot Section	1	EA	\$6,701.50
8b	8 Foot Section	1	EA	\$7,818.40
8c	10 Foot Section	1	EA	\$8,935.30
8x	Price for each 1.5mm thickness increase exceeding 10.5mm	1	EA	\$1,675.40
Sanitary Sewer Main and Lateral Connection Sealing by Chemical Grout				
GS1	Grout seal Main/Lateral Connection	1	EA	\$325.00
GS2	6" Diameter Main Pipe Joint, fracture or break	1	EA	\$27.90
GS3	8" Diameter Main Pipe Joint, fracture or break	1	EA	\$33.50

GS4	10" Diameter Main Pipe Joint, fracture or break	1	EA	\$39.10
GS5	12" Diameter Main Pipe Joint, fracture or break	1	EA	\$50.30
GS6	15" Diameter Main Pipe Joint, fracture or break	1	EA	\$55.80
GS7	16" Diameter Main Pipe Joint, fracture or break	1	EA	\$61.40
GS8	18" Diameter Main Pipe Joint, fracture or break	1	EA	\$72.60
GS9	20" Diameter Main Pipe Joint, fracture or break	1	EA	\$78.20
GS10	Grout > Initial 2 Gal./Joint, fracture or break	1	Gallon	\$17.90
Sanitary Sewer Cleanout				
LCO1	Lateral Cleanout Detail SS-19, 20, 21, and 25 Includes Fernco Ultra-Rib Coupling with Stainless Steel Bands (0 to 3 VLF) 4" service to 6" cleanout	1	EA	\$1,340.30
LCO2	Lateral Cleanout price beyond > 3 VLF Depth	1	EA Added VLF	\$418.80
Sidewalk				
SW1	Remove and Replace Sidewalk Section, 4" Thick, Matching existing width. Detail PD-07A. (3000 psi concrete)	1	Sq. Ft.	\$53.60
SW2	Same as SW1 except use detail PD-07B, Sidewalk Adjacent to Curb	1	Sq. Ft.	\$76.00
SW3	Same as SW1 except use detail PD-07D, monolithic curb/sidewalk	1	Sq. Ft.	\$86.00
SW4	Same as SW1 except cast with Coquina Mix	1	Sq. Ft.	\$113.90
SW5	Same as SW2 except cast from Coquina Mix	1	Sq. Ft.	\$136.30
SW6	Same as SW3 except cast from Coquina Mix	1	Sq. Ft.	\$160.80
Maintenance of Traffic (St. Johns County & FDOT)				

TM1	Traffic Control – MOT Index 601 or 602	1	Day	\$446.80
TM2	Traffic Control – MOT Index 603	1	Day	\$670.10
TM3	Traffic Control – MOT Index 604 or higher	1	Day	\$893.50
TM4	Traffic Control – MOT Index 601 or 602	1	Week	\$2,233.80
TM5	Traffic Control – MOT Index 603	1	Week	\$3,350.70
TM6	Traffic Control – MOT Index 604 or higher	1	Week	\$4,467.70
TM7	Flagman	1	Each Day	\$692.50
TM8	Variable Message Board (per week)	1	Week	\$2,233.80
Testing				
TS1	Grout Performance Demo Test	2	EA	\$558.50
TS2	Main Jt. Test	20	EA	\$55.80
TS3	Lateral connection Test	20	EA	\$474.70
TS4	CIPP cure water test	1	EA	\$1,116.90
TS5	CIPP Liner Test	3	EA	\$279.20
24 Hr. Emergency Services (3 Hr. Response Window)				
E1	Video Truck with work crew, Weekdays	1	Hourly Rate	\$279.20
E2	Video Truck with work crew, Holidays and Weekends	1	Hourly Rate	\$363.00
E3	Mobilization of Vactor and Video Truck	1	LS	\$558.50
E4	Vactor and Video Equipment Trucks with work crew, Weekdays	1	Hourly Rate	\$474.70
Mobilization				
M1	Mobilization for 20 workday period	1	EA	\$4,746.90
M2	Mobilization for work periods 20 to 40 workday period	1	EA	\$3,630.00
M3	Mobilization for work periods greater than 40 workdays.	1	EA	\$1,955.70
M4	Emergency Mobilization Less than 1 week	1	EA	\$5,863.80
Bond				

B	Contract Performance and Payment Bond Cost Not to Exceed 2%	NA	1.5%	1.5%
Warranty Inspections				
WI1a	Warranty Inspection 6" Lateral from main	1	LF	\$16.80
WI1b	Warranty Inspection 6" Lateral from cleanout	1	LF	\$11.20
WI2	Warranty Inspection 8" & 10" Main	1	LF	\$2.50
WI3	Warranty Inspection 12" Main	1	LF	\$3.00
WI4	Warranty Inspection 15" Main	1	LF	\$3.30
WI5	Warranty Inspection 16" Main	1	LF	\$3.90
WI6	Warranty Inspection 18" Main	1	LF	\$4.70
WI7	Warranty Inspection 20" Main	1	LF	\$6.10
WI8	Warranty Inspection Mobilization	1	EA	\$5,500.00

#PW2020-06

I HEREBY ACKNOWLEDGE, as Respondent's authorized representative that I have fully read and understand all terms and conditions as set forth in this Proposal and upon award of such Proposal, shall fully comply with such terms and conditions.

March 2, 2020

Date

Insituform Technologies, LLC

Respondent (firm name)

17988 Edison Avenue, Chesterfield, MO 63005

Address

jhass@aegion.com

E-mail address



636-530-8000

Signature

Janet Hass, Contracting & Attesting Officer

Telephone number

636-530-8701

Typed name and title

Fax number

TAB 7: LOCATION



Insituform[®]
an AEGION[™] company

LOCATION OF RESPONDENT'S MANAGEMENT OFFICE



Insituform's offices are located at 6966 Business Park Blvd. in Jacksonville, FL – approximately 24.2 miles from the City of St. Augustine's City Hall location. In addition to having a close office location, our Project Manager, Business Development Manager, General Superintendent, and Vice President/Area Manager are all St. John's County residents and reside less than 30 miles from the City of St. Augustine. Many are 20-year residents of the County.

This close proximity allows us to service the city's needs in a timely and efficient manner. Multiple lining crews are based out of the Jacksonville offices. We can quickly respond to any urgencies, should any issues arise that require quick attention, expedited mobilization, or a rapid response of management or services. Because of this geography, the Insituform team is uniquely positioned to best handle the city's needs and perform at the highest level on this contract.

