Bid No. 20-3257-1 - 2020 Cured-in-Place Pipe (CIPP) Project

ADDENDUM NO. 1

DATE:	August 21, 2020
REVISED BID OPENING:	**Thursday, September 3, 2020 @ 2:00:00 P.M.**
PAGES:	Addendum (29 pages)

Acknowledge receipt of this Addendum by inserting its number and date on the Bid Form. Failure to do so may subject bidder to disqualification. This Addendum forms a part of the Contract Documents. It modifies the Contract Documents as follows:

PART 1, ADVERTISEMENT FOR BIDS

Replace the first paragraph with the following:

Sealed bids will be received by the **City Clerk, City of Sandpoint, at City Hall, 1123 Lake Street in Sandpoint, Idaho 83864, until 2:00:00 p.m. local time on Thursday, September 3, 2020** for the Cured-in-Place Pipe (CIPP) Project.

PART 2, INSTRUCTIONS TO BIDDERS

ARTICLE 17 – EVALUATION OF BIDS AND AWARD OF CONTRACT

Replace Article 17.06 with the following:

The anticipated schedule for this project is as follows:

Bids Due – September 3, 2020

Anticipated Notice of Intent to Award – September 3, 2020

Anticipated City Council Approval – September 16, 2020

Anticipated Award Date and Notice to Proceed – September 23, 2020

Substantial Completion – June 30, 2021

Final Completion – July 31, 2021

PART 3, BID FORM

ARTICLE 6 – TIME OF COMPLETION & EMPLOYMENT

Replace Article 6.01 with the following:

Bidder agrees that all items included in the Base Bid or Bid Alternative will be substantially complete by June 30, 2021 and will be completed and ready for final payment in accordance with the General Conditions by July 31, 2021.

PART 4, AGREEMENT

ARTICLE 4 – CONTRACT TIMES

Replace Paragraph 4.02.A with the following:

For both the Base Bid and the Bid Alternative, the Work must be substantially complete by June 30, 2021, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions by July 31, 2021.

PART 7, SPECIAL PROVISIONS

SP-509 CURED-IN-PLACE PIPE (CIPP) SEWER REHABILITATION

Delete the section in its entirety and replace with the following:

ADDENDUM NO.1

PROFESSIONAL ENGINEER LICENSED 14693 STATE OF IDAHO PETER M. STAYTON August 21, 2020

DIVISION 500 SEWER

Section 509 – CIPP

Replace Section 509 – CIPP Sewer Rehabilitation with the following:

SP-509
CURED-IN-PLACE PIPE (CIPP) SEWER REHABILITATION

PART 1 GENERAL

1.1. SECTION INCLUDES

A. The work covered by this section of the specifications includes all labor, tools, equipment and materials, and performance of all operations in connection with the lining of existing sanitary sewer lines with jointless and seamless thermal or UV cured-in-place pipe (CIPP) as specified herein and as indicated in the Rehabilitation Schedules.

B. The work shall also include reopening service wyes or tees, removing protruding service connections, etc. When completed, the CIPP shall extend from end-to-end of the section being lined in a continuous jointless, seamless, tight fitting pipe-within-a-pipe as specified herein.

C. The purpose of the relining work is to restore and protect the interior pipe structure and surface and to seal faults in the sewer main to prevent root intrusion, infiltration/exfiltration, structural deficiencies, corrosive attack, etc.

1.2. RELATED SECTIONS

A. Idaho Standard for Public Works Construction (ISPWC) 2017 Edition.

B. SP-512– Sewer Cleaning and Television Inspection

C. SP-513 – Small Diameter (≤ 18-in) Sewer Bypass Pumping

D. SP-1103 – Traffic Control

1.3. REFERENCES

A. The following standards are included in this specification by reference:

1. ASTM D543 – Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents

2. ASTM D5813 – Standard Specifications for Cured-in-Place Thermosetting Resin Sewer Piping Systems

3. ASTM D638 – Standard Test Method for Tensile Properties of Plastics

4. ASTM D790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

5. ASTM D792 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

6. ASTM D883 – Standard Terminology Relating to Plastics

7. ASTM D903 – Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

8. ASTM D1600 – Terminology for Abbreviated Terms Relating to Plastics

9. ASTM D2990 – Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics

10. ASTM F1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube.

11. ASTM F2019 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP) Cured-in-Place Resin Pipe (CIPP).

12. ASTM D-5034 – Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

13. ASTM D790 Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

B. In the case of conflicting requirements between this specification and these referenced documents, this specification shall govern.

1.4. SUBMITTALS

A. Submit the following items prior to installation:

1. Installation Experience:
   a. For a Product to be considered Commercially Proven, the Product shall have been installed over at least the previous five years:
      1. For thermal cured CIPP, a total installed amount must exceed 1,000,000 feet in wastewater collection systems in the U.S.
      2. For ultraviolet cured CIPP, a total installed amount must exceed 100,000 feet in wastewater collection systems in the U.S.
   b. These installations must be documented to the satisfaction of the Owner to assure commercial viability.
2. Letters of qualification by the liner manufacturer(s) and the resin supplier(s) certifying the suitability of their products for use in the CIPP process, stating the history of successful application of these products in the CIPP process, and stating that these products have been supplied to and successfully used by the installation contractor.
3. Liner Manufacturer shall have in place a quality management system which complies with the requirements of ISO 9000. Submit certification of compliance with this standard.
4. Quality management system forms and quality records used at each step throughout the fabrication, wet-out, and installation process to demonstrate effective application of quality control methods and verification checks. These forms and quality records are subject to approval by the Engineer.
5. Engineering design calculations for the liner thickness used for installation of the CIPP performed and certified by a Registered Professional Engineer licensed in the State of Idaho. Liner design calculations shall conform to the minimum requirements contained in this specification. The submittal shall also include hydraulic calculations illustrating the impact to hydraulic capacity performed and certified by a Registered Professional Engineer of the State of Idaho.
6. Submit the following product and installation information:
   a. Description of all equipment, tools, and materials to be used during the rehabilitation. Identify which tools and equipment will be redundant on the job site in the event of equipment breakdown. All equipment to be furnished for the project,

including proposed backup equipment, shall be clearly described. The Contractor shall outline the mitigation procedure to be implemented in the event of key equipment failure during the installation process.

b. Contractor's description of the proposed rehabilitation lining method.

c. Contractor's description of the proposed procedures for removal of any existing blockages in the pipelines that may be encountered during the cleaning process (e.g., protruding service taps, roots, etc.).

d. Material Test reports.

e. Material Safety Data Sheets (MSDS) for the liner, resin, catalyst, cleaners and repair agents.

f. Manufacturers' shipping, storage and handling recommendations for:

1. Fabric Tubes.

2. Resin.

g. Certified Test Results from three (3) field installations within the previous 12- month period for the resin and fabric tubes proposed for use on this project that show the materials conform to the Contract Documents. The field sampling procedure shall be in accordance with ASTM F1216 and in accordance with ASTM D5813. Tests shall include, but not necessarily be limited to, physical properties of cured liner, chemical resistance, flexural strength, short- and long-term modulus of elasticity.

h. Installation and Cure Schedule: For each diameter and thickness of CIPP liner to be installed, submit an installation and cure schedule identifying the period of time that the sewer will be out of service to affected customers, including the following minimum work items:

1. UV Cured CIPP
   i. Liner installation
   ii. Total cure time
   iii. Lateral reinstatement (for the maximum number of laterals on a single reach on the project)

2. Thermal Cured CIPP
   i. Liner Installation
   ii. Total cure and cool-down time
   iii. Lateral reinstatement (for the maximum number of laterals on a single reach on the project)

i. The Manufacturer's narrative cure procedure description.

j. The Manufacturer's recommended cure schedule and cool down schedule (if applicable) for each diameter and thickness of CIPP liner to be installed. The cure and cool down schedule shall take into account the existing pipe material, the resin system, and site-specific ground conditions (temperature, moisture level, and thermal conductivity of soil) for each installation on the project in accordance with ASTM F1216, 7.6.

1. For thermal cured CIPP, the cure and cool down schedule shall include the following minimum information, including the target and acceptable ranges of variation for each measurement:

   i. Hot Water Curing:

      a. Heat-up Time
      b. Curing Time
      c. Curing Temperature
      d. Post-curing Time
      e. Cool-down Rate
      f. Interface Temperature
      g. Cool-down Temperature prior to relieving internal pressure

   ii. Steam Curing:

      a. Heat-up Time
      b. Curing Time
      c. Curing Air Temperature
      d. Post-curing Time
      e. Cool-down Rate
      f. Post-curing Air Temperature
      g. Interface Temperature
      h. Cool-down Rate
      i. Cool-down Temperature prior to relieving internal pressure

2. For UV cured CIPP, the manufacturer's recommended cure method schedule for each diameter and thickness of CIPP liner

to be installed using UV light curing including but not limited to:

i. Record of time,

ii. Rate of travel of the ultraviolet light assembly,

iii. Internal temperature; and

iv. Internal pressure.

k. Theoretical resin amount required for full wet-out per diameter and liner thickness, including liner absorption amount and percent excess resin applied. Express resin quantities on a volumetric and mass basis.

l. Resin Manufacturer's gel test results, including the time and temperature to reach an exothermic reaction.

m. End seal material and manufacturer's required preparation, application, and curing procedures for sealing the CIPP liner to the manhole, including all pertinent test data showing applicability for use with CIPP and concrete products.

n. For thermal cure CIPP:

1. Contractor's written certification that thermal curing equipment to be used on the project will exceed the thermal curing requirements of all lines on the project, as required by the liner manufacturer. Provide a description of steam or water boiler equipment including type, number of units, size, capacity, and thermal output.

2. Continuous temperature monitoring manufacturer's literature including product data, installation method, data viewing method and number of viewers available. Contractors shall submit supporting manufacturer's literature if use of continuous temperature monitoring is proposed for adjustment of cure times or cool-down temperatures from the liner manufacturer's recommendations or ASTM F1216 standards.

7. Sewage bypass pumping and/or diversion plan for review by the Engineer per SP-513.

8. Sewage Spill Prevention Plan and Sewage Spill Response Plan

9. Letter to Owner/Engineer stating that the Contractor has conducted an initial inspection of the sewer mains and 1) has determined that the sewer is in a condition suitable for effective application of a cured-in-place pipe, 2) listed and detailed any conditions which may affect the

quality of the final product, or 3) indicated why the location and existing conditions would preclude installation of the selected product.

B. Submit the following items at the time of installation or within 24 hours thereafter.

1. A certified copy of the wetout sheet (batch ticket) for each liner delivered to the site and installed, including quality control forms and inspection sheets for each liner.
2. Certified copies of all cure logs submitted each week with the CIPP field samples. Certified copies of all cure logs shall be submitted for each installation to the Owner's representative weekly.
3. All preliminary post-installation television inspection logs and records. At the request of the Owner’s representative, the Contractor shall provide preliminary copies of the post-installation videos for review on a weekly basis.
4. Air temperature log of storage container in which the resin-impregnated liner is held prior to installation. Temperature shall be logged daily, as a minimum. Note any variations in temperature due to malfunctions with refrigerating equipment or other causes. Storage temperature shall not exceed manufacturer’s recommendations at any point prior to cure.
5. For thermal cure only, submit all continuous temperature monitoring records for each installation. Data shall include temperatures for the entire process including installation, cure times and cool down.

C. Submit the following items prior to Substantial Completion.

1. Two copies of pre- and post-installation video inspections and logs on DVD or USB Flash Drive for Owner’s records and Engineer’s use.
2. Copies of all quality control forms and quality records used at each step throughout the fabrication, wet-out, and installation process.
3. CIPP test results from independent testing company.
4. Leakage test results.

1.5. USE OF SEWERS PRIOR TO COMPLETION

A. The Owner hereby reserves the right to make use of any portion of the Work prior to completion of the entire Contract without invalidating the Contract and without constituting acceptance of any of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

A. Fabric Tube

1. The liner shall be constructed to withstand installation pressures as required by the manufacturer's recommendations and bridge missing pipe wall segments or other defects and stretch to fit irregular pipe sections.
2. The fabric tube shall be manufactured to a size that when installed will tightly fit the internal circumference, meeting ASTM D 5813, 6.3.1 standards or better, and the length of the original pipe. Allowance should be made for circumferential stretching during installation.
3. Liners shall be cured-in-place to cure resin composite into a hard, impermeable and structurally sound pipe. When cured, the new material shall extend over the entire length of the insertion in a continuous, tight-fitting, watertight pipe within a pipe.
4. The fabric tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the fabric tube that may cause de-lamination in the cured CIPP. No dry or unsaturated layers shall be acceptable upon visual inspection as evident by color contrast between the felt fabric and the activated resin containing a colorant.
5. The outside of the fabric tube shall be marked with the name of the manufacturer, manufacturing lot and production footage.
6. The wall color of the interior pipe surface of CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made. The hue of the color shall be dark enough to distinguish a contrast between the fully resin saturated felt fabric and dry or resin lean areas.
7. Seams in the fabric tube shall be equal to or greater in strength than the un-seamed felt fabric.
8. The minimum length of the fabric tube shall be that deemed necessary by the installer to effectively span the distance from the starting manhole to the terminating manhole or access point, plus that amount required to run-in and run-out for the installation process, unless otherwise specified.
9. Prior to installation, the liner shall be free of all tears, holes, cuts, foreign materials, and other defects.

10. Additionally, for thermal cured CIPP:

    a. The tube shall consist of one or more layers of flexible needled felt or an equivalent non-woven or woven material, or a combination of nonwoven and woven materials capable of carrying resin, and compatible with the resin system used. Specialty liners manufactured with fiberglass or glass reinforcement will be evaluated per ASTMF1216 with complete submittal.

    b. The wetout fabric tube shall meet ASTM F 1216- 7.2, and shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.

    c. The nominal fabric tube wall thickness shall be constructed to the nearest 1.5 mm increment (or manufacturer's standard increment), rounded up from the design thickness for that section of installed CIPP. Wall thickness transitions, in 1.5 mm increments (or manufacturer's standard increment) or greater as appropriate, may be fabricated into the fabric tube between installation entrance and exit access points. The quantity of resin used in the impregnation shall be sufficient to fill all of the felt voids for the nominal felt thickness.

    d. The outside layer of the fabric tube (before inversion, as applicable) shall be coated with an impermeable, flexible membrane that will contain the resin and facilitate vacuum impregnation and monitoring of the resin saturation during the resin impregnation (wetout) procedure.

11. Additionally, for UV cured CIPP:

    a. The tube material shall meet the requirements of ASTMF1216, ASTM F1743, ASTM D5813, and ASTM F2019 in addition to the specifications set forth herein.

    b. The fiberglass liner shall have a second UV blocking outer layer applied during manufacturing.

    c. Interior and exterior plastics shall be styrene resistant to protect and contain the resin used in the Liner.

    d. The minimum allowable wall thickness for fiberglass CIPP (UV light Cured) products is 3 mm and can be increased as necessary to meet ASTM F1216/F2019 Design Formula in 1.0mm increments and meet or exceed the design strength criteria pending approved liner thickness calculations after cure.

e. The outside layer of the tube shall be translucent plastic coated with flexible material that clearly allows inspection of the resin impregnation or wetout procedure.

B. Resin

1. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of all voids in the tube material with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe. The amount of resin used shall exceed the calculated value by five to ten percent (5%-10%). Resin in excess of the calculated value shall be uniformly distributed throughout the length of the liner. The volume of resin required to meet the conditions listed above, shall be calculated for the diameter, thickness and targeted additional allowance of each diameter and thickness of CIPP liner per unit length, typically, per foot, and submitted to the Owner/Engineer for review.

2. Additionally, for thermal cured CIPP:

   a. The resin shall be a corrosion resistant polyester, vinyl ester, or epoxy resin and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216, the physical properties herein, and those to be utilized in the design of the CIPP for this project. The resin shall produce CIPP that will comply with the structural and chemical resistance requirements of this specification.

   b. The resin shall be able to cure in the presence of water, and the initiation temperature for cure shall be less than 180° F.

   c. The activated resin shall contain a colorant compatible with the resin, catalysts and the installation and curing process, such as CreaNova(r) CHROMOCHEM 844-7260 Phthalo-Blue, or equivalent. Colorant addition to the resin shall be sufficient to provide visual contrast between areas of the fabric tube with or without resin.

3. Additionally, for UV cured CIPP:

   a. The resin shall be a corrosion, shrinkage and abrasion resistant UV cured isophthalic polyester resin that when properly cured within the tube composite meets the requirements of ASTM F2019, the physical properties herein, and those to be utilized in the design of the CIPP for this project. The resin shall produce CIPP that will comply with the structural and chemical resistance requirements of this specification.

b. The acceptable resin shall have been tested according to ASTM D2990, D5813, and F1216 by accredited third party testing facilities. Results of these tests shall be submitted to the Engineer prior to approval for installation.

c. The resin must be manufactured under ISO 9001:2015 certified procedures. The resin must have a heat deflection temperature greater than 224 degrees Fahrenheit. Only PREMIUM, NON-RECYCLED resins will be accepted.

C. CIPP Structural Requirements

1. The CIPP shall be designed as follows:

a. For thermal cured CIPP, design shall be in accordance with ASTM F1216, Appendix X.1 and assuming no bonding to the existing pipe wall.

b. For ultraviolet cured CIPP, design shall be in accordance with ASTM F1216, Appendix X.1 or ASTM F2019 Appendix X1 and assuming no bonding to the existing pipe wall. Provisions in ASTM F2019 Appendix X1.1.2 shall not apply when using ASTM F1216.

2. The design flexural modulus shall be de-rated from the laboratory values published by the resin supplier by an amount that reflects the Contractor's confidence in their field sampling method and that takes into account field conditions that are less ideal than the laboratory environment. The Contractor must have performed long-term testing for flexural creep of the CIPP pipe material installed by its Company. Such testing results are to be used to determine the long-term time dependent flexural modulus to be utilized in the product design. This is a performance test of the materials (Tube and Resin) and general workmanship of the installation and curing as defined within the relevant ASTM Standard. A percentage of the instantaneous flexural modulus value (as measured by ASTM D790 testing) will be used in design calculations for external buckling. The percentage, or the long-term creep retention value utilized, shall be verified by this testing. Retention values exceeding 50 percent of the short-term test results shall not be applied unless substantiated by qualified third party test data to the Engineer's satisfaction. The materials utilized for the 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.

3. The Enhancement Factor "K" to be used in 'Partially Deteriorated' design conditions shall be assigned a value of 7. Application of Enhancement (K)

Factors in excess of 7 shall be substantiated through independent test data.

4. The cured pipe material (CIPP) shall conform to the structural properties listed below:

a. Minimum Physical Properties for UV Cure CIPP.

Property	Test Method	Cured Composite Per ASTM F1216
Flexural Modulus of Elasticity	ASTM D-790 (short term)	1,000,000 psi
Flexural Strength	ASTM D-790	25,000 psi

b. Minimum Physical Properties for Thermal Cure CIPP.

Property	Test Method	Cured Composite Per ASTM F1216
Flexural Modulus of Elasticity	ASTM D-790 (short term)	250,000 psi
Flexural Strength	ASTM D-790	4,500 psi

c. The required structural CIPP wall thickness shall be based on the following physical properties:

1) For thermal cured CIPP, thickness shall be in accordance with the Design Equations in the appendix of ASTM F1216, and the design parameters listed in subsequent sections. In no case shall the finished cured thickness be less than 6.0 mm for pipe diameters 8-inch and larger and 4.5 mm for 6-inch diameter pipes.

2) For ultraviolet cured CIPP, thickness shall be in accordance with the Design Equations in the appendix of ASTM F1216 or ASTM F2019, and the design parameters listed in subsequent sections. In no case shall the finished cured thickness be less than 3 mm. Provisions in ASTM F2019 Appendix A1.1.2 shall not apply when using F1216.

3) Site design criteria for UV and thermal cured CIPP:

Design Safety Factor 2.0
Retention Factor 50%
Ovality ..... 2% minimum, or actual if ≥2%
Modulus of passive soil reaction ..... 1,000 psi
Groundwater Depth..... at ground surface

Soil Depth (above the crown)	Varies, See Plans
Live Load	H-20 Highway
Soil Load	130 lb/cu. ft.
Minimum service life	50 years
Pipe Condition	Fully deteriorated

D. CIPP Physical Requirements

1. Chemical resistance - The CIPP shall meet the chemical resistance requirements of ASTM F1216. CIPP samples tested shall be of the fabric tube and resin proposed for use on this project. It is required that CIPP samples with or without plastic coating meet these chemical testing requirements.

2. Hydraulic Capacity - The hydraulic profile shall be maintained as large as possible. The CIPP shall have a minimum of the full flow capacity of the original pipe before rehabilitation. Calculated capacities may be derived using a commonly accepted roughness coefficient for the existing pipe material taking into consideration its age and condition.

E. End Sealing

1. Each end of the CIPP shall be sealed to provide a watertight seal between the original pipe and the CIPP liner. Sealing materials shall be compatible with the original pipe material and shall be suitable for application to moist surfaces.

2. Unless specified otherwise in the Overall Rehabilitation Schedule, acceptable end sealing products include:

   a. **ES-1:** A quick setting fiber reinforced calcium aluminate sulfate resistant cementitious material. Product shall be Strong-Seal QSR, or approved equal.

   b. **ES-2:** A two component, 100% solids, solvent-free, moisture tolerant, high-modulus, high-strength, structural epoxy paste adhesive conforming to ASTM C-881, Types I and IV, Grace-3, Class-B and C. Product shall be Sikadur 31, Hi-Hod Gel manufactured by Sika, NPR-5305 manufactured by Neopoxy, or approved equal.

   c. **ES-3:** A single component hydrophilic polyurethane sealant. Product shall be Swellseal WA manufactured by DeNeef, or approved equal.

d. **ES-4:** A single component hydrophilic neoprene rubber compression gasket. Product shall be LMK, or approved equal.

PART 3 EXECUTION

3.1. GENERAL

A. The Contractor may utilize any of the existing manholes in the project area as manhole access points. Coordinate work with related, adjacent aspects of work. If a street must be closed to traffic because of the orientation of the sewer, the Contractor shall provide traffic control measures as required in SP-1103

B. The Contractor shall implement a public notification program regarding individual sewer service outages and contact each home or business connected to the sanitary sewer to inform them of the nature, duration, and expected date of any interruption in service. If necessitated by the business, Contractor shall provide temporary sanitary facilities specifically for use by the business for the duration of construction affecting that business. Nighttime work shall not be permitted except as indicated in the Supplementary Conditions or as authorized by Owner. During the course of the rehabilitation and any associated service interruption, the residents or businesses shall be kept regularly informed regarding any matters that affect them. The Contractor shall also provide:

1. Written notice to be delivered to each resident or business on three separate occasions as follows: 1) one week, 2) forty-eight hours and 3) twenty-four hours prior to beginning construction activity on the segment of sewer.
2. Information on the written notice shall include a brief description of work, anticipated time frame, project phasing points, traffic impacts, Contractor contact phone number, how services will be maintained, and any additional information on minimizing construction impacts.
3. The example flyer **attached** at the end of this section shall be used for project notification. This flyer will be made available to the Contractor in digital format and may be modified slightly to update contact information or details pertinent to this project.

C. Implement traffic control devices per SP-1103.

3.2. MATERIAL STORAGE AND TRANSPORTATION

A. TRANSPORTATION AND HANDLING

1. Transport and handle products in accordance with manufacturer's instructions.
2. Promptly review shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

B. STORAGE AND PROTECTION

1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
2. For exterior storage of fabricated products, place on sloped supports, above ground.
3. Provide off-site storage and protection when site does not permit on-site storage or protection.
4. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
5. Arrange storage of products to permit access for review. Periodically review to assure products are undamaged and are maintained under specified conditions.

3.3. SEWER LINE PREPARATION

A. Cleaning of Sewer Lines - The Contractor shall remove all internal debris from the sewer line that will interfere with the installation of CIPP per SP-512. Liquid waste similar in character to domestic wastewater may be discharged in the sewer at the downstream end of this project. Gravel or other debris shall be retained and disposed of according to local, State, and Federal regulations by the Contractor.

B. Bypass Sewage Pumping shall be performed per SP-513 and be in place prior to installation. The Contractor shall limit interruption of sanitary sewer service to each facility connected to the sewer reach as noted in below, and/or provide such other temporary sanitary facilities as may be required during the execution of work. If sewage backup occurs and enters a facility, the Contractor shall be responsible for clean-up, repair, property damage costs, and all claims, at no cost to the Owner.

1. Maintain sanitary sewer service at all times. If sewage backup occurs during cleaning, liner installation, or other construction activities and enters a facility, the Contractor shall be responsible for cleanup, repair, property damage, costs, and all claims at no cost to the Owner.

a. Main Lines: Bypass pumping, temporary piping, and any other measures required to maintain sanitary sewer service per SP-513.

b. Service Lines: The maximum outage for service lines shall be four hours for businesses and six hours for individual residences. Contractor shall coordinate with affected parties and coordinate activities and schedules.

i. Service outages for services connected to mainline pipe reaches in the downtown corridor, as specified in the overall rehabilitation schedule, shall be permitted only between the hours of 11 pm and 8 am.

ii. If these outage limits cannot be satisfied, Contractor may be required to work alternate or evening hours to minimize impacts to businesses or residences.

C. Contractor shall perform pre- and post-installation video inspections of the pipelines per SP-512. Only experienced personnel trained in locating breaks, obstacles and service connections by closed circuit television shall perform the inspection. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of CIPP into the pipelines, such as protruding service taps, collapsed or crushed pipe, and significant reductions in the cross sectional area. Known problems are shown or generally noted on the rehabilitation schedules or noted as point repairs. If additional conditions are noted that affect installation, Contractor shall notify the Engineer in writing requesting clarification on how to proceed. A video record and suitable log shall be kept and submitted to the Owner and Engineer per SP-512.

D. Line Obstructions – Protruding service laterals that will interfere with the installation and long-term performance of the CIPP shall be removed.

E. The Contractor shall be responsible for confirming the locations of all lateral service connections prior to installing and curing the CIPP. Contactor shall coordinate with residents, as necessary. Owner reserves the right to conduct dye testing or other field investigation to determine if service is active.

3.4. LINER INSTALLATION

A. All point repairs shown on the rehabilitation schedules shall be completed prior to liner installation unless noted otherwise or approved by the Engineer.

B. All structural or corrosion protection manhole coatings shown on the rehabilitation schedules and Plans shall be completed following liner installation unless noted otherwise or approved by the Engineer.

C. All materials used throughout the installation process, including but not limited to oils and resin materials, shall be contained within the sewer collection system. Materials used in construction shall not enter the stormwater collection system. All streets, sidewalks and manhole lids shall be clean of installation materials, including oils and resins, following installation.

D. If installation of liner should fail for any reason and the liner removed from pipe reach, the liner shall not be reused for rehabilitation of original or other pipe reach.

E. Resin Impregnation - The person in charge of the Contractor's wetout process shall submit a certified wetout sheet that shows the quantity of resin placed into the fabric tube, and certifies that the information is accurate and the resin was distributed uniformly throughout the fabric tube, as noted. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A vacuum or pressure impregnation process shall be used.

F. A roller system shall be used to uniformly distribute the resin throughout the tube. The roller gap dimension shall be calculated by a method that determines the correct volume of resin/felt per unit length (foot, yard or meter), contained within the confining perimeter of the flexible membrane. Appropriate sleeves and rollers shall be used to protect the liner.

G. Care shall be taken not to damage the deformed pipe or existing sewer lines or manholes during the installation.

1. For thermal cured liners, appropriate sleeves and rollers shall be used to protect the liner

2. For ultraviolet cured liners, appropriate sleeves and rollers shall be used to protect the liner in addition with installation of a sliding foil.

H. The CIPP Liner shall be installed and cured in the host pipe per the manufacturer's instructions, following the methods indicated in the materials submitted under this specification.

1. Thermal cured CIPP installation shall be in accordance with ASTM F1216, Section 7, except as modified herein.

2. UV cured CIPP installation shall be in accordance with ASTM F2019, Section 6, except as modified herein.

I. During overnight installations, provide noise abatement of portable power generation equipment and pumps to limit noise to 70dba or less at a distance of 30 feet from noise source.

J. Additionally, for thermal cured CIPP:

1. Curing shall be accomplished by utilizing hot water or steam under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule. The heat source in and output temperatures shall be monitored and logged during the cure and cool down cycles at 5 minute intervals. Contractor shall submit manufacturer literature if use of the continuous temperature monitoring adjusts cure times.

2. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing water or steam supply.

3. Temperature monitoring shall be end of liner or continuous as described below and where specifically noted in the rehabilitation schedule.

a. End of liner temperature monitoring shall be required for all installations and shall be incidental to bid. Prior to installation remote temperature gauges (thermocouple wires) shall be placed inside the host pipe and the CIPP liner at the invert level and crown (6- and 12- o’clock positions) of each end to monitor the temperatures during the cure cycle. Liner and host pipe interface temperature shall be monitored and logged during cure and cool down.

b. Continuous liner temperature monitoring shall be required in addition to end of liner temperature monitoring where specifically noted in the rehabilitation schedule and shall reference Section 4 for measurement and payment when applicable. Sensors shall be strategically placed at points where a significant heat sink is likely to be anticipated. The fiber optic system shall be connected to a

laptop computer and collect temperature readings and log data for continuous monitoring during cure and cool-down, as well as, future analysis and documentation of the temperature gradients during all aspects of the curing process, including heating, exotherm, curing, and cool-down of the CIPP installation. The system shall also provide a secure web-based application that will allow 2 seats for the Owner and Engineer to log in from a computer and/or smartphone and monitor the cure and cool-down process remotely for the entire duration. Such access shall be provided through cellular service. Contractor shall provide end of the liner temperature monitoring in accordance with these specifications with all continuous temperature monitoring.

4. Cool Down

a. The Contractor shall initiate a controlled cool-down to cool the hardened liner in accordance with ASTM F1216, 7.7, until the temperature at the invert level and crown (6- and 12-o'clock positions) at both ends of the liner reaches the level specified by the liner manufacturer, but no greater than 113°F for steam cure or 100°F for heated water cure, as measured by remote temperature gauges, before relieving the internal pressure or static head within the section. Air used in the cool down stage shall not be cooled below ambient air temperature before introduction to the rehabilitated pipe.

b. Temperatures shall be monitored and recorded throughout the installation process at 15 minute increments, as required by the manufacturer's cure schedule, and/ or as otherwise required by the Engineer to ensure that each phase of the process is achieved at the approved manufacturer's recommended temperature. Temperature records for each cure shall be available to the Engineer at all times and submitted to the Owner and Engineer on a weekly basis, as a minimum.

c. The Contractor shall not release untreated styrene in cure water, if water inversion/cure method is used. Acceptable methods are as follows:

i. **Containment of the cure water:** Containment shall be required until the styrene has sufficiently oxidized. Laboratory test results will be required to demonstrate the absence of styrene prior to the release into the collection system.

ii. **Treatment of the cure water:** Treatment with non-hazardous chemicals, such as ammonium persulfate (Styredux), is required to treat the cure water until the styrene concentration is less than 10 ppm before releasing cure water to the collection system. Contractor must submit a narrative description of proposed process for the styrene reduction, minimum dose and holding time calculations, and any other information as requested by the Engineer to demonstrate effectiveness of the proposed method.

K. Additionally, for UV cured CIPP:

1. The Liner shall be pulled-in through an existing manhole or approved access point and fully extend to the next designated manhole or termination point. The pulling speed shall not exceed 15 ft/min. Care shall be exercised not to damage the tube during the pulling phase.

2. Liner Inflation: The Liner shall then be inflated with air with sufficient pressure to hold the Liner tight to the host pipe wall.

3. Curing shall be accomplished by utilizing ultraviolet curing lamps operating in a sufficient frequency range to insure the curing of the resin in accordance with the manufacturer's recommended cure schedule and ASTM F2090.6.7. A camera must be located on the ultraviolet light assembly to enable the video inspection of the Liner and to insure that the Liner has been properly inflated and any liner problems can be identified before curing begins.

4. Submit a documented field log recording of time, rate of travel of the ultraviolet light assembly, and internal temperatures and pressures during the curing process to the Engineer. Include CCTV video record of each lining segment.

L. Finish

1. The finished lining shall be continuous over the entire length of an installation run and be free from visual defects such as foreign inclusions, dry spots, pinholes, and de-lamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to inside the lined pipe.

2. Any defect, which will or could affect the structural integrity or strength of the linings, shall be repaired at the Contractor's expense. Contractor shall propose a repair method for approval by the Owner and Engineer.

3.5. QUALITY CONTROL

A. QUALITY ASSURANCE/CONTROL OF INSTALLATION

1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
2. Comply fully with manufacturers' instructions, including each step in sequence.
3. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
4. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

B. CONSTRUCTION OBSERVATION AND TESTING LABORATORY SERVICES

1. The Owner shall employ and pay for engineering and observation during construction for quality assurance. Contractor shall employ and pay for services of an independent testing laboratory and firm acceptable to the Engineer for quality control.
2. The Owner’s representative shall oversee observation of all tests run in the field. Contractor shall coordinate all required testing with the Owner’s representative.
3. The Contractor shall be responsible for providing the equipment and manpower to assist the Engineer in taking additional tests for quality assurance.
4. The Contractor shall provide the equipment and manpower and conduct all tests on underground utilities as required in the specifications at his expense.
5. The Contractor shall notify the Engineer of the time in which tests are to be run twenty-four (24) hours prior to testing.
6. Reports will be submitted to the Engineer, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
7. Cooperate with the Engineer; furnish samples of materials, mix designs, equipment, tools, storage, and assistance as requested.

    a. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.

b. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

8. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm at no cost to the Owner on instructions by the Owner's Representative. Reference to original failing test shall be referenced.

3.6. LEAKAGE TESTING

A. Testing shall be performed after the CIPP has cooled per manufacturer's recommendation. The liner shall be tested before it has been sealed in-place at the manholes and prior to service lateral reinstatement.

B. Low Pressure Air Test Procedure

1. After a manhole-to-manhole section of the existing host conduit has been replaced, and prior to any service lines being connected to the replacement pipe, the pipe shall be plugged at each manhole with pneumatic plugs.
2. The design of the plugs shall be such that they will hold against the test pressure without requiring external blocking or bracing. One of the plugs shall have three air hose connection: one to inflate the plug, one to attach the gauge to read the air pressure in the sealed line, and one to introduce air into the sealed line.
3. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psi greater than the average back pressure due to groundwater pressure on the pipe. At least two minutes shall elapse to allow the pressure to stabilize.
4. The time required for internal pressure to decrease from 3.5 to 2.5 psi greater than the average back pressure (groundwater pressure) on the pipe, shall not be less than the time shown in the following table for the given pipe diameter:

New Pipe Diameter	Minimum Elapsed Time
8-inch and smaller	4 minutes
10-inch	5 minutes
12-inch	6 minutes
15-inch and larger	7 minutes

C. Hydrostatic Exfiltration Testing – As an alternative to the Low Pressure Air Test, pipes 24 inches in diameter or greater may be tested by hydrostatic exfiltration per ISPWC Section 501.3.4.D.

3.7 INSPECTION AND TESTING

A. The Contractor shall prepare a minimum of two CIPP samples for each pipe size used on the project (8-inch diameter and greater) for testing in accordance with ASTM F1216. One sample from each of the following two methods shall be provided.

1. For host pipe diameters 18 inches and smaller: The sample shall 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.
2. For host pipe diameters greater than 18 inches: The sample shall 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.

B. The samples for each of these cases shall be large enough to provide a minimum of three specimens. After the sample is cured and removed, the following tests shall be performed by an independent third party. Contractor shall bear all costs for testing. Submit results to the Engineer in duplicate.

1. Short-Term Flexural (Bending) Properties-The initial tangent flexural modulus of elasticity and flexural strength shall be measured for gravity and pressure pipe applications in accordance with ASTM D 790 and shall meet the requirements of Section 2.1.C.4.
2. Take wall thickness measurements in accordance with ASTM D5813 and ASTM 3567. 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. Wall thicknesses that exceed the design thickness by the greater of 2 mm or 15% may be considered non-compliant if, in the judgment of the Engineer, this will impede O&M, hydraulic capacity, future work, etc. The average cured liner thickness should be calculated using all measured values and shall meet or exceed minimum design (nominal) thickness per the contract documents. The average cured liner thickness shall be calculated using all measured values and shall meet or exceed minimum nominal (finish cured) thickness per the contract documents.
3. Sample outside diameter, measured at the pipe quadrants.
4. Samples shall be taken in the presence of the OWNER or OWNER'S REPRESENTATIVE. Samples shall be identified by: date, time, project, and location (street location, pipe reach).

C. Finished CIPP liner shall be free from wrinkles totaling more than 5% of host pipe inside diameter, or ½", whichever is greater.

D. Post-Installation Television Inspection

1. The Contractor shall perform a post-installation television inspection of the installed replacement pipe in accordance with SP-512 Sewer Cleaning and Television Inspection.
2. The Contractor shall verify the connection of all service laterals and that the liner was not damaged during installation.
3. All post-installation television inspection logs and records shall be submitted weekly to the Engineer for final approval. Any additional work to reconnect services or repair damaged CIPP shall be conducted by the Contractor at no additional cost to the Owner.

E. Any defects in the liners which will affect the integrity or strength of the liners, in the opinion of the Engineer, shall be repaired by the Contractor at no expense to the Owner in a manner satisfactory to the Engineer.

3.8 LATERAL REINSTATEMENT

A. The exact location and number of service connections shall be determined by the Contractor. It shall be the Contractor's responsibility to accurately field locate all existing service connections, whether in service or not.

B. The Contractor shall reconnect all service connections to the liner immediately following testing unless noted otherwise in the rehabilitation schedules or directed otherwise in writing by the Engineer / Owner.

C. The Reinstatement method shall be robotic cutting from pipe interior.

D. Service connections shall be restored to not less than 90 percent and not more than 105 percent capacity and shall have smooth flow line.

E. The Contractor shall be responsible for restoring and/or correcting, without any delay, all missed or faulty reconnections, as well as for any damage or costs to property owners for not reconnecting services designated for reinstatement.

3.9 PROTRUDING SERVICE TAPS

A. Method shall be robotic cutting from pipe interior.

3.10 CLEAN-UP

A. Upon acceptance of the installation work and testing, the Contractor shall restore the project area affected by the operations to a condition at least equal to that existing prior to the work.

PART 4 MEASUREMENT AND PAYMENT

4.1 CIPP Rehabilitation to be measured in accordance with the following and as identified on the Bid Schedule.

A. CIPP Rehabilitation: By the linear foot for the pipe size indicated on the Bid Schedule measured on a horizontal basis for each manhole-to-manhole reach. Includes moving equipment from reach to reach, set up for installation, materials, labor, tools, testing, surface restoration, reinstating drop manholes, and related work described in the Contract Documents.

1. Bid Schedule Payment Reference: SP-509.4.1.A.1.
Bid Schedule Description: CIPP Rehabilitation *[pipe size]*… linear foot (LF).

B. Cut of Protruding Laterals: On a per each basis for removing protruding service connections. Includes moving equipment from reach to reach, set up for removal, labor, tools, clean-up and disposal and related work described in the Contract Documents.

1. Bid Schedule Payment Reference: SP-509.4.1.B.1.
Bid Schedule Description: Cut off Protruding Laterals… per each (EA).

C. Lateral Reinstatement: On a per each basis for internally reinstating laterals on the main line with a remote controlled cutter or by man entry. Includes moving equipment from reach to reach, set up for reinstatement, pre-construction logging of service locations, labor, tools, clean-up and disposal, and related work described in the Contract Documents.

1. Bid Schedule Payment Reference: SP-509.4.1.C.1.
Bid Schedule Description: Lateral Reinstatement… per each (EA).

END OF SECTION

SEWER MAIN WORK SCHEDULED

The City of Sandpoint has scheduled a City sewer main rehabilitation project in your area. The method of rehabilitation has been chosen by the City to minimize construction impacts to you. The work will be completed by accessing nearby manholes only; no excavation is anticipated for this work. Construction impacts are expected to be limited to less than one day in your area.

_____
Street or alley

_____
Date(s)

Here's how you may be affected (only the marked conditions apply to this project):

- ☐ Please do not use your laundry and dish washer, and limit other water use for the day to facilitate sewer main work.
- ☐ Your driveway may be blocked for brief periods on the date(s) listed above. You may need to make alternate plans for parking on the date and times listed above
- ☐ This work will occur during daytime hours, involving the operation of motorized equipment near your home or place of business
- ☐ This work will occur during nighttime hours, involving the operation of motorized equipment near your home or place of business
- ☐ Other:

_____
_____
_____
_____
_____

Thank you for your patience. If you have any questions, please contact the City Public Works Department at the numbers listed on the back.

PROJECT NAME

2020 CIPP Project

CONTACTS

Bryan Card
Project Manager
208.964.2061

END OF ADDENDUM NO. 1