

SECTION 01100

GENERAL CONSTRUCTION REQUIREMENTS

PART 1 - Description.

To establish uniform requirements for construction of water distribution facilities, sanitary sewerage collection facilities, storm sewer collection systems, streets, and associated appurtenances which will enable the construction to be performed in accordance with Local, State, and Federal laws.

1.01 Definitions.

- A. For the purposes of these specifications, the words and phrases set out in the following articles shall have the meanings as follows:
1. "City" means the governing body of the city of Lakeland, TN.
 2. "Contractor" means the individual, partnership, firm, or corporation contracting with the developer or the City which will be performing the work, or which will be performing the construction activities.
 3. "Developer" means partnership, firm, or corporation developing property where construction will be performed.
 4. "Engineer" means the consultant or City Engineer.
 5. "Owner" means the individual, partnership, firm or corporation being the owner of record of property where construction will be performed.
 6. "Underground facility" means any item of personal or public property buried or placed below ground for use in connection with the storage or conveyance of electronic, water, sewage, telephonic or telegraphic communications, cable television, electric energy, oil, gas, hazardous liquids, or other substances and including, but not limited to pipes, sewers, water, storm water, conduits, cables, valves, lines, wires, manholes, and attachments.
- B. The following abbreviations shall have the designated meanings:
1. "APWA" means the American Public Works Association.
 2. "ASTM" means the American Society for Testing and Materials.
 3. "AWWA" means the American Water Works Association.

4. "AASHTO" means the American Association of State Highway & Transportation Officials.
- C. Reference to a specific specification, i.e., AWWA C900, means the latest Edition of that specification.

PART 3 Execution

3.01 Scheduling and Construction Progress.

- A. Prior to the start of any work, the Contractor shall submit in writing to the Engineer for review, a progress schedule that shall be followed as closely as possible. Progress scheduling using critical path method is approved and encouraged. Once work has started on a street, it must be pursued continuously until all work on that street is finished.
 1. The Contractor shall schedule a preconstruction conference prior to the start of work. Persons attending shall include representatives of the Contractor, subcontractors, owner, developer, Engineer, and affected utilities.
- B. Each successive phase of work will follow the preceding phase as closely as possible so that the time any one street is under construction is kept to a minimum.
- C. In the event that the work is not being accomplished expeditiously or in accordance with the time period set forth in the progress schedule, or if the work on an excavation has ceased or is abandoned without due cause, the Engineer may give written notice to the Contractor and/or the surety company for the project.

3.02 Notification of Landowners, Residents, and Businesses

- A. At least one (1) week prior to beginning construction operations Contractor shall notify in writing, all those directly affected by the Work, including the Fire, Ambulance, Police Departments, and the Engineer's Office. The notification shall include the following as a minimum:
 1. Name, address, telephone number, and contact person for Developer, Developer's Contractor, Owner, and Engineer.
 2. A brief description of the proposed Work.
 3. Name and telephone number of Contractor's person to contact in emergency.
 4. A map showing the Work area, the traffic control plan, and the planned access to be provided to the affected properties. The map should also show the property or business owners' access during construction, and access in case of an emergency for fire, ambulance, police, or other emergency service agency vehicles.

5. A schedule for start up and completion of the Work. Schedules shall be updated as needed as the work progresses.
6. Contractor shall notify property owner and occupant 24 hours in advance of any disruption of service or access.

3.03 Available Maintenance Personnel

The Contractor shall have personnel available to maintain the Work as required, 24 hours per day every day. Accordingly, the Contractor shall furnish the City, the Owner, the Engineer, and the Shelby County Sheriff's Office with the names, addresses, and telephone numbers of local employees or representatives who will be available to maintain the Contractor's work during non-working periods, evenings, nights, weekends, and holidays.

3.04 Utility Locates

- A. It is the responsibility of the Contractor to obtain locates for buried facilities within the project area prior to the start of work as necessary and as required by law. The Contractor is responsible for any damage to buried utilities or damage or injury to persons or property resulting from Contractor's work in the vicinity of the utilities.
- B. It is the responsibility of the Contractor to provide advance notice to all utility notification centers serving that area. The Contractor shall request the notification center to provide the nature, location, and elevation of the utility at each location and at whatever interval is necessary for the work. If the utility company cannot or will not provide the information, the Contractor shall obtain the information by whatever means are necessary. For each location that the utility is exposed, the Contractor shall locate the utility by tying it both horizontally and vertically by coordinates, to the datum established by the City.
- C. At all utility crossings the Contractor shall locate the utility at a minimum of one point directly over the proposed line or appurtenance. When existing utilities that parallel the proposed line or appurtenance are exposed by excavation, the Contractor shall locate the utility by tying it both horizontally and vertically to the datum and include the information on the record drawings. At a minimum, the utility shall be tied horizontally and vertically at 300-foot (90 m) intervals.
- D. If during the field location of the utilities, additional unforeseen utilities are discovered, the Contractor shall immediately notify the Engineer and proceed in accordance with approval of the Engineer. The utility must be located by the Contractor as specified above and include the information on the record drawings.
- E. The Contractor must protect all existing utilities and improvements, public or private, located on the right-of-way, and other work areas, during the entire period of his work. Special care must be taken in backfilling and compacting under and around

such improvements. Any breakage or damage to underground facilities caused by trenching, backfilling, resurfacing, or any other activity associated with the work shall be the responsibility of the Contractor.

- F. Whenever utility mains or services are crossed, the utility owner shall be notified and the crossing shall be constructed in accordance with the utility owner's requirements.
- G. Before the Contractor begins his grading operations, he shall confer with the owners of any underground or overhead utilities which may be in or in close proximity to the grading areas, and shall arrange for the necessary disconnection of these utilities in accordance with the regulations of the utility companies concerned. The Contractor shall take such measures as the Engineer may direct in protecting these utilities properly throughout the period his grading operations are in progress. The party or parties owning or operating overhead or underground utilities shall perform the actual work of moving, repairing, reconditioning, or revising the utilities, except as otherwise specified in this Section. Whenever and wherever such operations are undertaken by the owners of utilities, the Contractor shall cooperate to the extent that ample protection of their work will be provided so that the entire work as contemplated may be expedited to the best interests of all concerned, as judged by the Engineer.
- H. Protect and safeguard existing service lines and utilities structures, the locations of which have been made known to the Contractor by the owners of the utilities or by others, prior to excavation or construction of fills or embankments, from damage during grading operations. Any damage to such lines or structures shall be repaired at the Contractor's expense. The above provisions are applicable to all service lines or utilities structures, all or any portion of which protrude above the original ground or street surfaces, or lie beneath such surfaces in any grading area or any other area upon which the Contractor has encroached.

3.05 Protection of Existing Buildings and Structures

For collapse of adjacent buildings, sidewalks, structures, and underground or above ground utilities, the Contractor shall repair damage done to the owner's property or any other property, on or off the premises, by reason of his operations. The Contractor shall adequately brace walls during backfilling and compacting operations.

3.06 Construction Stakes – Alignment and Grades

- A. All work shall be constructed in accordance with lines and grades shown on the drawings and as designated by the Engineer. These lines and grades may be modified by the Engineer as provided in the General Conditions.
- B. The Contractor shall provide experienced personnel, materials, and equipment necessary to complete all survey, layout, and measurement work. The Contractor shall keep the Engineer informed a reasonable time in advance, of the times and places he wishes to do work so that initial control points may be designated.

3.07 Restoration of Street Surface, Street Signs, Curbs, Driveways, Sidewalks, Irrigation and Landscaping

- A. Wherever existing improvements are removed, damaged or otherwise disturbed by Contractor's activities, Contractor shall replace or repair the improvements to conditions equal to or better than the condition prior to the start of work. Any crushed rock, sod, or natural vegetation disturbed by the Contractor shall be replaced, rebuilt or restored to conditions equal to or better than the condition prior to the start of work.

3.08 Temporary Utilities, Public Access and Safety

- A. Contractor shall provide temporary water and sewer service to properties when permanent facilities will be out of service for eight (8) hours or longer, or when other circumstances make it necessary. Where service cannot be interrupted, such as sewer mains, Contractor shall provide plant and equipment to pump around the sections which are out of service.
- B. Where the Engineer deems necessary, the Contractor shall provide access wherever possible to public and private property to prevent serious inconvenience to pedestrian and vehicular traffic. This shall not be construed to require the Contractor to provide such access at the times and locations where it will interfere with his construction progress. The Contractor shall furnish, place, and maintain sufficient flags, flares, barricades, signs, etc., along the location of his work in accordance with the Federal Highway Administration, "Manual on Uniform Traffic Control Devices." Flag persons shall be utilized if necessary to maintain safe traffic flow.

3.09 Erosion and Sediment Control

- A. Erosion and sediment control shall be performed in accordance with rules and regulations adopted by the City of Lakeland and the Tennessee Department of Environment and Conservation.

3.10 City Permits

- A. All necessary permits shall be obtained prior to the beginning of any construction project. Those permits may include: City of Lakeland/TDEC Permit to Construct, Street Cut Permits, Traffic Control Permits, Bonds, and Erosion and Sediment Control Permit, as well as any other appropriate permits required for the project by the City.

3.11 Punchlist and Final Closeout

- A. Initial City Punchlist

1. The Contractor, Owner, Engineer, and City personnel will conduct an initial walkthrough and develop a list of deficiencies that will be presented to the Contractor by the Engineer.
2. The Contractor, Owner, and Engineer will conduct a walkthrough identifying items to be corrected. A final punch list will be developed by the Contractor and Engineer. The punch list will contain dates for completion of the various identified items.
3. All items on the list will be completed to the satisfaction of the City prior to acceptance of the project and start of the one-year warranty period.

3.12 Submittals

The Contractor shall submit for approval by the Engineer a minimum of five (5) copies of data required by specific sections of this specification.

3.13 Workmanship and Cleanup

- A. All debris and rubbish caused by the operations of the Contractor shall be removed, and the areas occupied during his operations shall be left in a neat and presentable condition satisfactory to the Engineer. Construction cleanup and all backfill operations shall immediately follow installation of underground facilities. Cleanup shall be completed to allow local traffic on the street and access to driveways, parking lots, etc. During construction, all existing gutters, storm drains, runoff channels, etc. shall be kept clean of dirt, rubble, or debris which would impede the flow of storm sewer.
- B. Excess, unsuitable, and waste materials from the project (including that from trench excavation, pavement removal, curbwalk removal, and grading operations), shall be suitably disposed of, offsite, by Contractor.
- C. Excess material resulting from parkway and shoulder finishing and other final operations shall not be permitted to accumulate on the pavement surface and shall be removed concurrently with the finishing operations. Care shall be taken to prevent the entrance of this material into drainage structures or other waterways during the construction period. It shall be the responsibility of the Contractor to properly dispose of all excess material.

3.14 Design Mixes, Testing and Quality Assurance

- A. The testing requirements and cost responsibilities of design mixes, testing requirements, and quality assurance testing are listed in each specific section of these specifications.
- B. Unless specified by the contract documents, or addressed specifically within these

Standard Specifications, the Owner will be responsible for moisture/density/compaction testing only. If the initial moisture/density/compaction test fails to meet the minimum standards as established by these specifications, the Contractor shall pay for any and all additional tests until a moisture/density/compaction test meeting the minimum standards is obtained.

END OF SECTION

SECTION 01010

SUMMARY OF WORK

A. Project Identification:

Fiscal Year 2020 Pipe Lining

B. Project Summary:

This project consists of rehabilitating certain sections of the City of Lakeland's storm sewer system by cured in place pipe (CIPP) lining. All pipe is reinforced concrete pipe ranging in size from 15 inches to 36 inches in diameter. The attached spreadsheet provides a quantity and size breakdown by location.

A general description of the work includes the following; however this is not an exhaustive list:

- Rehabilitate storm sewer pipe by CIPP liner from manhole/catch basin to manhole/catch basin. The CIPP sectional liner shall meet City of Lakeland Construction Specifications as well as ASTM F1216 and be installed accordingly.
- Post lining, video inspection shall be performed to verify proper installation of CIPP liner.
- Traffic control is required for repairs conducted in an area in which traffic will be affected. One lane of roadway must remain open at all times. All traffic control will be considered incidental to the work.
- All construction material shall be removed and properly disposed of in accordance with State and local regulations within the time limits of the project.

C. Particular project requirements.

1. Apply for, obtain, and pay for permits when required to perform the work.
2. Field-verify dimensions indicated on drawings (when applicable) before fabricating or ordering materials. Do not scale drawings.
3. Notify Owner of existing conditions differing from those indicated on the drawings. Verify the existence and location of underground utilities along the route of proposed work. Omission from, or inclusion of, locations on the drawings, is not to be considered as the nonexistence of, or the definite location of, existing underground utilities. Do not remove or alter existing utilities without prior written approval.
6. The Contract Documents are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth

but which is reasonably implied or necessary for proper performance of the project shall be included.

7. The Provisions are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, "furnish..." means "Contractor shall furnish..."

END OF SECTION

FISCAL YEAR 2020 PIPE LINING

Location	PIPE SIZE (in)	QTY	UNIT
4320 Canabridge Cv	36	195	LF
Canabridge Cv	36	84	LF
4327 Canabridge Cv	36	181	LF
9360 Canabridge Dr	30	18	LF
9360 Canabridge Dr	36	141	LF
3896 Leeward Slopes Cv	21	92	LF
3896 Leeward Slopes Cv	15	74	LF
3896 Leeward Slopes Cv	15	124	LF

SECTION 01200

PROJECT COORDINATION

PART 1 – Description

1.01 SUMMARY

- A. Contractor shall schedule a preconstruction conference (if required) to be held within twenty (20) days of the Notice of Award. Contractor's assigned supervisory personnel and subcontractors shall attend this conference. Contractor shall provide a work schedule at or prior to this meeting for review by all parties. A corrected schedule shall be provided within seven (7) days following the meetings.
- B. Conduct all construction activities between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday, except in cases of emergencies. No work will be allowed on Saturdays without the Owner's permission, and no work, except for emergencies, will be allowed on Sundays or City of Lakeland Holidays. All pavement subgrade excavation shall be observed by the Owner Representative. The Owner's Representative shall determine the depth of the subgrade excavation prior to backfill.
- C. Contractor shall obtain water for use during construction at his expense. If Contractor elects to obtain water from the public water utility, he will make all the arrangements, comply with their regulations, and pay all fees and charges.

1.02 COORDINATION WITH PUBLIC AND PRIVATE AGENCIES

- A. If utility companies elect to repair or replace their lines in the project area, their crews will be permitted access to the area to accomplish their work.
- B. Contractor is responsible for locating and protecting existing underground improvements. Contact all utility companies for location of their facilities. To contact all utility companies call the local underground number at least 48 hours prior to excavation for field locates.
- C. Contractor shall have personnel available to maintain his work as required 24 hours per day every day. Contractor is responsible for housekeeping, dust and erosion control, and shall provide all equipment and personnel necessary to meet the requirements of this responsibility. Contractor shall provide Engineer with the name(s) and telephone number(s) of the person(s) designated to be available for after-hours contact. If this person cannot be contacted, Owner may use its equipment to correct problems. In this case, Contractor shall pay all costs incurred by Owner.
- D. Do not utilize private property for any purpose without written permission from the property owner.

1.03 COORDINATION WITH OWNER AND ENGINEER

- A. Construct all work in accordance with the lines and grades shown on the Drawings, and as designated by Engineer (when applicable). Engineer may modify these lines and grades as provided in the General Conditions. Where the Contract Documents specify survey work to be provided by Engineer, give Engineer a minimum of 24 hours notice.
- B. Owner shall employ and pay for the services for an independent testing agency to perform tests as required by the Contract Documents. Notify Engineer a minimum of 24 hours in advance to request testing. Contractor shall be responsible for cost of re-tests required if the results of the original tests do not meet the minimum requirements.
- C. Coordinate on-site staging areas, access and temporary facilities with Owner.
- D. For additional information, contact Emily Harrell, PE, Lakeland City Engineer at 867-5418.

1.04 COORDINATION OF CONSTRUCTION

- A. Contractor is responsible for coordinating work of all trades by preparation of schedules and progress reports, coordination of drawings and other work as necessary.
- B. Schedule work to produce orderly, continuous progress and avoid delays due to lack of materials, subcontractor schedule, lack of available manpower, etc.
- F. Contractor is responsible for ensuring that installed and/or completed work is complete and satisfactory prior to enclosing or covering. Call for required inspections in a timely manner and do not cover work that requires inspection.

END OF SECTION

SECTION 01340

SUBMITTALS

PART 1 - Description

1.01 Summary

- A. Comply with Submittal format requirements as specified in the Contract Documents.
- B. Provide, in a timely manner, the number of copies and types of submittals listed in individual sections of the Contract Documents. If not specified elsewhere, provide the following as a minimum:
 - 1. Mix designs and certifications of compliance for Portland Cement Concrete, Cement Treated Base, Aggregate Base Course, Asphaltic paving material, and any other material or product used as part of this project as required in the Standard Specifications.
 - 2. Closeout submittals.
- C. Provide required resubmittals in the appropriate quantities if original submittals are not approved.
- D. Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note any special coordination required. Note any deviations from requirements of the Contract Documents. Submittal data shall be properly labeled indicating specific service for which material or equipment is to be used, section and article number of specifications, project name, Contractor, etc. Data of a general nature will not be accepted.
- E. Failure of Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time.

END OF SECTION

SECTION 01505

TEMPORARY FACILITIES

PART 1 - Description

1.01 Summary

A. Provide temporary services and utilities, including utility costs:

1. Potable and non-potable water.
2. Lighting and power.
3. Toilet facilities.
4. Materials storage.
5. Heating.

B. Provide construction facilities, including utility costs;

1. Construction equipment.
2. Dewatering and pumping.

C. Provide security and protection requirements:

1. Fire extinguishers.
2. Site enclosure fence, barricades, warning signs, and lights.
3. Snow and ice removal, if applicable.

D. Provide personnel support facilities:

1. Sanitary facilities.
2. Drinking water.
3. Cleaning and trash removal.
4. First aid and Emergency Medical Services.
5. Trash removal.

END OF SECTION

SECTION 01650

MEASUREMENT AND PAYMENT PROCEDURES

PART 1 – Description.

All work completed under this Contract will be measured by the Engineering according to the bid items and to the construction drawings. Units of measurement and dimensions will be shown in these specifications.

1.01 Payment

A. Progress payments will be processed in accordance with the following schedule.

<u>Cut-Off Date</u>	<u>Date of Submittal</u>
September 27, 2019	October 04, 2019
November 01, 2019	November 08, 2019
December 06, 2019	December 13, 2019
January 10, 2020	January 17, 2020
February 28, 2020	March 06, 2020

Submit pay requests to the City by the dates of submittal listed above.

- B. Owner will make progress payments as defined in Article 5 of the Agreement, on the forms provided by the Engineer.
- C. If the Contractor elects to enter into a joint account agreement, two (2) pay requests and vouchers must be submitted. One pay request and voucher for the appropriate progress payment amount, the other for the retained amount.

1.02 Measurement of Quantities

Quantities shown on the bid schedule are estimated and are to be considered approximate. Actual constructed quantities will vary. The Contractor will be compensated only for those items and materials actually installed and approved as part of the project. No additional pay will be granted for items or materials not installed.

- A. Payment will be made for the work completed and stored materials less retained amounts in accordance with provisions of the contract documents.
- B. Payment amounts will be based on the scheduled values and mutually agreed upon percentage of completion for each item.

1.03 Bid Item Descriptions

The cost of all material and labor required to complete this project as specified and shown on the drawings, but not specifically included as a pay item, shall be included in the bid price of its related bid item. No extra pay shall be granted for items that are reasonably foreseen as necessary for the proper installation of an item.

PART 3 Execution

3.01 Measurement and Payment of Bid Items

- A. Furnish and Install Cured in Place Pipe (CIPP) Lining for 15” Diameter Reinforced Concrete Pipe
 - 1. Measurement of this item shall be by linear foot (LF) of reinforced concrete pipe lined with cured in place pipe liner and approved. Payment shall be full and complete compensation for providing labor, equipment, materials, and ancillary items to complete the work including but not limited to cleaning of the pipe, video inspection of the pipe before and after lining, temporary traffic control, post lining testing, and appurtenant work whether specifically delineated herein or incorporated by reference. Payment shall be made by the contract unit price per Linear Foot (LF).

- B. Furnish and Install Cured in Place Pipe (CIPP) Lining for 21” Diameter Reinforced Concrete Pipe
 - 1. Measurement of this item shall be by linear foot (LF) of reinforced concrete pipe lined with cured in place pipe liner and approved. Payment shall be full and complete compensation for providing labor, equipment, materials, and ancillary items to complete the work including but not limited to cleaning of the pipe, video inspection of the pipe before and after lining, temporary traffic control, post lining testing, and appurtenant work whether specifically delineated herein or incorporated by reference. Payment shall be made by the contract unit price per Linear Foot (LF).

- C. Furnish and Install Cured in Place Pipe (CIPP) Lining for 30” Diameter Reinforced Concrete Pipe
 - 1. Measurement of this item shall be by linear foot (LF) of reinforced concrete pipe lined with cured in place pipe liner and approved. Payment shall be full and complete compensation for providing labor, equipment, materials, and ancillary items to complete the work including but not limited to cleaning of the pipe, video inspection of the pipe before and after lining, temporary traffic control, post lining testing, and appurtenant work whether specifically delineated herein or incorporated by reference. Payment shall be made by the contract unit price per Linear Foot (LF).

- D. Furnish and Install Cured in Place Pipe (CIPP) Lining for 36” Diameter Reinforced Concrete Pipe
 - 1. Measurement of this item shall be by linear foot (LF) of reinforced concrete pipe lined with

cured in place pipe liner and approved. Payment shall be full and complete compensation for providing labor, equipment, materials, and ancillary items to complete the work including but not limited to cleaning of the pipe, video inspection of the pipe before and after lining, temporary traffic control, post lining testing, and appurtenant work whether specifically delineated herein or incorporated by reference. Payment shall be made by the contract unit price per Linear Foot (LF).

END OF SECTION

SECTION 01750

CONTRACT CLOSEOUT

PART I Description

1.01 Summary

- A. Provide prerequisites to substantial completion.
 - 1. Punch list.
 - 2. Supporting documentation.
 - 3. Warranties.
 - 4. Certifications.

- B. Provide prerequisites to final acceptance.
 - 1. Final payment request with supporting affidavits.
 - 2. Completed punch list.
 - 3. Submit record documents: One set of drawings and project manual with all changes noted in red and Project Manual changes flagged with page tabs.
 - 4. Final clean-up.
 - 5. Removal of temporary facilities.

END OF SECTION

SECTION 01810

SPECIAL PROVISIONS

PART 1 Description

1.01 SUMMARY

- A. These "Special Provisions" supplement, clarify, or modify provisions of Specifications as they apply to this project.
- B. Requirements of Special Provisions, General and Supplemental Conditions apply to work performed under all sections of this project.
- C. Work of this contract shall include all work required to construct the entire Project as shown on the drawings and defined by the Specifications and other contract documents, unless specific exceptions are stated therein.
- D. DISCREPANCY BETWEEN SPECIAL PROVISIONS, SPECIFICATIONS, AND PLANS. In the event of discrepancy between Special Provisions and other sections of the Specifications, the Special Provisions will take precedence over the Specifications, the General Conditions, and the Supplemental Conditions. The Specifications will take precedence over the Plans.

1.02 LABOR PRACTICES

A. EIGHT-HOUR WORK DAY

The Contractor's attention is directed to, Limitation on work hours; overtime; exceptions. a) No person shall require laborers, workmen, or mechanics to work more than eight hours in any one calendar day or forty hours in any one week upon any public works of the state, or any of its political subdivisions, except as hereafter authorized. An employee may agree to work more than eight hours per day or more than forty hours in any week provided the employee shall be paid at the rate of one and one-half times the regularly established hourly rate for all work in excess of forty hours in any one week.

1.03 BACKFILL OBSERVATION

No work shall be covered before the Project Representative or Engineer has approved the work. If any piping or appurtenance is covered without the approval of the Engineer or Project Representative, at the discretion of the Engineer, the Contractor will be required to

re-excavate to expose the covered materials. The cost of exposing those materials and then backfilling and compaction will be at the Contractor's expense, regardless of the condition of the pipe and/or the materials under question.

1.04 CONSTRUCTION WATER

The Contractor is responsible for supplying water for construction purposes. If the Contractor wishes to use existing fire hydrants for water, he shall make the proper arrangements with the owner of the hydrant. The Contractor will be responsible for compliance with that owner's requirements as well as the payment of any fees for its use. Construction water is considered incidental to this project and no separate payment will be made to the Contractor for this item. If the Contractor wishes to use water from a resident, he shall obtain written permission from that resident to do so.

1.05 SAFETY

In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for safety conditions at and adjacent to the job site, including the safety of all persons and property during the performance of the work. The Contractor shall comply with all federal, state, and local safety laws and regulations. This requirement shall apply continuously, and shall not be limited to normal working operations. The Engineer's construction review of the Contractor's performance is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site. This paragraph shall be applicable to the Contractor and all of the Contractor's subcontractors.

In addition, the Contractor shall provide barriers, fences, signs, lights, etc. as necessary to control access to the site.

Contractor shall provide Owner a written copy of their confined spaced program, proof of record-keeping protocol and inventory of appropriate equipment such as monitors for atmospheric hazards and rescue equipment. These documents shall be submitted at the preconstruction conference.

1.07 DUST CONTROL

The Contractor shall be responsible for dust and erosion control, and for minimizing dust and erosion to the Owner's satisfaction. Dust and erosion control shall be deemed to be incidental and shall not be a pay item.

1.08 DISPOSAL OF WASTE MATERIALS

Excess, unsuitable, and waste materials from this project (including that from trench

excavation, pavement removal, piping removal, and grading operations), shall be disposed of, offsite, by Contractor. Such disposal shall be considered incidental, and shall not be a pay item.

1.09 CODES AND STANDARDS

All materials and the completed installation shall comply with applicable standards promulgated pursuant to the State of Tennessee and City of Lakeland.

1.10 OPEN EXCAVATIONS

The Contractor shall completely backfill all excavations before stopping work for the day. No excavation (fenced or unfenced) shall be left open overnight, over a weekend, nor any period in which no work at that location is underway. The cost of reopening or re-excavation due to this provision will be borne by the Contractor.

1.11 CONSTRUCTION SURVEYING AND STAKING

In this project, lines and grades of replaced appurtenances shall match those existing. When new appurtenances such as drain lines, catch basins, curb, sidewalks, and new roadway crowns are to be installed, the Contractor will provide construction surveying and staking, unless otherwise noted.

1.12 CLEANING AND FINISHING

After completion of all work all debris and foreign material will be removed by the contractor. The project area, including staging areas, shall be clean and functional. This will include the restoration of any disturbed landscaping in the work area.

1.13 TRAFFIC CONTROL

A traffic control plan is required for repairs in areas affecting traffic. The Contractor is responsible for furnishing a traffic control plan to the City Engineer at least one week prior to the start of construction. Excavations which traverse a street shall be limited to one-half the width of the street at any one time, unless an emergency situation exists which requires the entire width of the street be excavated. The City Engineer's approval is required prior to traversing an entire street. The closure should not exceed forty-eight (48) hours and proper signage shall be installed detouring traffic and warning of construction.

END OF SECTION

SECTION 01551

TEMPORARY TRAFFIC CONTROLS

PART 1. Description

To establish uniform requirements for detours, signs and barricades, and traffic control plans associated with construction activities performed on or affecting City of Lakeland streets. The work in this article shall consist of furnishing, erecting, maintaining, relocating, and removing temporary traffic control devices at the locations specified on the drawings and as directed by the Engineer. All traffic control devices shall conform to the provision for construction signing as set forth in the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) latest edition.

PART 2 MATERIALS

2.01 Traffic Control Products

A. Sign Panels

1. Sign panels will be constructed of $\frac{3}{4}$ " plywood conforming to plywood sign panels and barricades of the standard specification for road and bridge construction; or 6061-T6 or 5052-H38 aluminum alloy sheeting conforming to ASTM B209.
2. Wood sign panels will be backed with metal backing angles; except that backing is not required for those sign panels 48" x 60" or smaller.
3. Aluminum sign panels will be 0.125" thick and backed with metal backing angles; except that those sign panels 48" x 60" or smaller may be:
 - i. 0.080" thick and backed with metal backing angles or 2 x 4 lumber; or,
 - ii. Unbacked, 0.125" thick.
4. Special signs which are unique to the project, i.e., signs not shown on the plans or included in part VI of the MUTCD, and signs shown on the plans which contain a message that is unique to the project, will be furnished by the contractor, as specified on the plans, and erected by the Contractor. Posts and hardware for fixed special sign installations, and all equipment for portable special sign installations will be furnished by the contractor. Post lengths will be specified by the Engineer. Upon removal, the special sign panels, posts, hardware, and portable installation equipment will remain the property of the Contractor.

- i. Special signs will be erected on fixed mountings unless portable mountings are authorized by the Engineer.
- B. Barrels will be plastic conforming to the MUTCD, with 6" wide reflective stripes.
- C. Temporary markings
 1. Temporary reflective pavement markings will be paint, preformed tape, or raised pavement markers, and will be suitable for use on either Portland cement concrete or asphalt pavements. Minimum acceptable standards are as follows:
 - i. Paint used for temporary markings will be commercially manufactured highway striping paint. The paint will be applied without dilution.
 - ii. All painted stripes will be 4" wide, and will be reflectorized by dropping or spraying glass beads onto the wet paint.
 - iii. The reflective beads will conform to AASHTO Specification M247, Type 1.
 2. Temporary reflective pavement striping tape will be 4" wide, pressure-sensitive tape manufactured for use as pavement striping.
 - i. Striping tape applied to finished pavement surfaces which will be returned to normal traffic use will be a removable type.
 - ii. Striping tape applied to temporary pavement surfaces which will be obliterated may be a non-removable type.
 - iii. Striping tape applied to the surface of intermediate lifts of asphalt pavement may be non-removable type, and may be let in place. If a removable type is used, it will be removed before placing the next lift.
 3. Temporary retro-reflective raised pavement markers manufactured by Astro Optics of Schaumburg, Illinois, Model No. TPM, or Stimsonite Products of Niles, Illinois, Model No. 66, or an approved equal will be acceptable.
 4. Temporary retro-reflective motorist guidance markers manufactured by Davidson Plastic Company of Ken, Washington, Model NO. TRPM, or TOM, or an approved equal will be acceptable.

PART 3 EXECUTION

3.01 Traffic Control Plans

- A. A complete traffic control plan shall be submitted to the Engineer and the Lakeland City Engineering office at least one week prior to the start of construction.
1. Traffic will be permitted to use the street at all times, unless a detour is specifically permitted on the drawings or by the Engineer. Access to all abutting residences and properties shall be maintained to the maximum extent possible.
 2. The Contractor shall construct and maintain temporary crossings, complete with flagmen, whenever necessary to expedite the work or to maintain traffic. The Contractor shall furnish not less than two flagmen at each location where loading or depositing of material requires the turning of the trucks on any highway or street and where the operation of construction equipment endangers traffic. Temporary crossings shall be of ample size to safely carry the load which comes upon them.
 - i. The Contractor shall maintain the streets in a passable condition. The work shall be conducted so as to create a minimum of inconvenience to traffic.
 - ii. Excavations which traverse a street shall be limited to one-half the width of the street at any one time, unless an emergency situation exists which requires that the entire width of the street be excavated. City Engineer's office approval is required prior to excavation traversing an entire street.
 3. The Contractor shall furnish sufficient signs and barricades to facilitate the directing of traffic. Unless directed otherwise by the Engineer, all signs and barricades shall conform to:
 - i. Within the "Manual on Uniform Traffic Control Devices (MUTCD)," latest edition.
 4. The Contractor shall have a sufficient number of barricades and signs on hand prior to the start of the construction
 - i. Each detour sign shall be reflectorized and shall be illuminated with two battery-powered blinkers with six-inch (6") amber lenses.
 - ii. All barricades shall have blinker lights on each end.
 - iii. It shall be the Contractor's responsibility to make necessary checks and inspections of all lights and barricades every day, including Sundays and holidays.
 5. Temporary suspension of work does not relieve the Contractor of the responsibility outlined in the above requirements.

3.02 Permits

- A. The Contractor shall obtain all necessary permits from the City Engineer's office for any closure of any street or portion thereof, as provided in the Lakeland Municipal Code. Along with the permit application, the Contractor shall provide a sketch showing traffic routing and traffic control devices to be used. The construction traffic control sketch shall be approved by the City Engineer's office before the permit is issued.

3.03 Street Closure

- A. The City Engineer may permit the closing of streets to all traffic for a period of time prescribed by the office if, in the City Engineer's Opinion, it is necessary.

END OF SECTION

SECTION 02533

SANITARY SEWER LINE REHABILITATION

PART 1 - Description

- A. The scope of work to be performed shall be to furnish necessary labor, materials, equipment, and appurtenant work to rehabilitate designated sections of sanitary sewer mains in the City of Lakeland, Tennessee in accordance with this special provision and the contract documents. Specifically, the applicable standards and materials to rehabilitate gravity wastewater pipelines by cleaning, remotely investigating, and inserting a continuously extruded, folded, PVC pipeliner or a resin impregnated flexible tube into an existing gravity pipeline (host pipe) and then thermoforming the pipeliner to conform to the shape of the host pipe are enumerated here. This specification covers work, materials and equipment required for protecting and/or rehabilitating existing sanitary sewer mains with liners anchored to the interior wall to eliminate infiltration, provide corrosion protection, repair voids, and enhance structural integrity. Procedures for surface preparation, cleaning, application, and testing are described herein.
- B. It is the intent of the specifications and drawings to provide an installation complete and functional in all respects. The Contractor will be responsible for this result. The omission of an express reference to work necessary or incidental to a complete installation shall not be construed as releasing the Contractor from providing such work at the contract price bid.
- C. This Special Provision shall supplement, amend, and where in conflict therewith, supersede those conflicts in Section 02530 of the Technical Specification.

PART 2 - Materials

- A. Sanitary sewer pipe used to implement point repairs to the existing PVC mains shall be PVC SDR 26 in conformance with ASTM D-3034 for eight (8) inches, twelve (12) inches, and fifteen (15) inches in diameter as modified by the contract documents. Appurtenant items such as couplings used to reconnect to the existing main and "control density backfill" to prevent connection movement shall conform to the applicable provision of Section 02530. All materials incorporated into the project shall be new.
- B. Cement used to grout manhole inverts or other uses shall be Type I in conformance with ASTM C150. The minimum twenty-eight (28) day compressive strength for concrete be four thousand (4,000) pounds per square inch.
- C. This specification references the following American Society For Testing and Materials (ASTM) standards, which are made a part hereof by such reference and shall be the latest applicable edition and revision thereof:

ASTM D-256 Standard Test Methods for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics

ASTM D-638 Standard Test Method for Tensile Properties of Plastics

ASTM D-790 Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics

ASTM D-1784 Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM D-2444 Standard Test Method for Impact Strength

ASTM D-2122 Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

ASTM D-2152 Standard Test Method for Extrusion Quality using Acetone Immersion

ASTM F-1057 Standard Test Method for Extrusion Quality using Heat Reversion

ASTM F-1871 Standard Specification for Folded/formed Poly (Vinyl Chloride) Pipe Type A for Existing Sewer and Conduit Rehabilitation

- D. Cured in Place Pipe installations shall meet the requirements of ASTM F1216, the specific requirements and conditions of the liner manufacturer. Only one method of liner installation shall be performed on the project. The minimum uniform wall thickness of the liner material shall be 0.229 inches for Cured in Place Pipe installations. The materials shall meet the following criteria:

Flexural Stress (ASTM D-790)	4,500 psi
Modulus of Elasticity (ASTM D-790)	400,000 psi
Tensile Strength (Gravity Sewer ASTM D-638)	2,500 psi

- E. The PVC pipeliner will be manufactured from unused PVC compound, containing no fillers, and meet or exceed the following minimum physical properties:

COMBUSTIBILITY	Self-Extinguishing
FLEXURAL MODULUS	ASTM D-790 145,000 PSI @ 73F
FLEXURAL STRENGTH	ASTM D-790 4,100 PSI @ 73F
IZOD IMPACT	ASTM D-256 15 FT-LB/IN
CHEMICAL RESISTANCE	ASTM D-1784 (suitable for use under general sanitary sewer conditions)

- F. The PVC pipeliner shall be designed to meet the following installed performance requirements:

1. The pipeliner shall be capable of expanding a full pipe size larger than the nominal diameter (i.e.: 8" to 10") without splitting or rupturing.

2. After being expanded, the installed pipeliner will match the configuration of the host pipe, with a concave dimple typically appearing at each service connection.
 3. The pipeliner shall be capable of negotiating pipeline bends in the host pipe without splitting, rupturing or wrinkling of the pipeliner material.
 4. The pipeliner shall be dimensionally stable immediately after cool-down, so as to permit immediate service connection reinstatement.
 5. The pipeliner shall have an ASTM D-1784 impact resistance cell classification of no less than five (5), to resist splitting during remote controlled service connection reinstatement.
 6. Processing of the pipeliner shall cause no degradation of the pipeliner physical properties.
- G. The pipeliner shall be marked at maximum five (5) foot intervals indicating ASTM D-1784 cell classification, manufacturer, and size (diameter and SDR). Each production lot will be uniquely coded.
- H. The pipeliner outside diameter will be manufactured substantially smaller than the inside diameter of the host pipe. The pipeliner shall be manufactured with sufficient excess wall thickness to allow the pipeliner to meet or exceed the DR requirements after being expanded. The Standard Dimension Ratio (SDR) of the pipeliner will be 32.5 with a DR range of 30 to 37.
- I. The PVC pipeliner will be continuously extruded at the factory to the minimum length required to effectively span the distance between manholes, in accordance with actual distances which shall be field verified by the Contractor prior to manufacturing.
- J. The PVC liner shall be Ultraliner PVC Alloy pipeliner, manufactured by Ultraliner, Inc., or AM-Liner II or approved equal. Alternate materials must be approved not less than 7 days prior to bid date.
- K. Each production lot of pipeliner will be inspected and tested at the time of manufacture for defects in accordance with STM D-2444, ASTM D-2122, and ASTM D-2152. All pipeliners shall be homogeneous, uniform in color, free of cracks, holes, foreign material, blisters and deleterious faults. All pipeliners shall conform with the specified dimensions. Material design properties shall be confirmed in accordance with ASTM D-790.
- L. **WARRANTY:** A written warranty shall be provided by the manufacturer warranting the materials against all defects for a period of one year from the date of substantial completion. This warranty shall be in addition to the general warranty required of the Contractor in the General Conditions.
- M. The following items shall be submitted to the Engineer prior to initiating liner work and shall include technical data sheets on each product used, including ASTM test results indicating the product conforms to and is suitable for its intended use per these specifications. Additional information to be supplied shall include Material Safety Data Sheets (MSDS) for

each product used, project specific guidelines and recommendations, qualifications of applicator, and design details for any additional ancillary systems and equipment to be used in site and surface preparation, application and testing. The liner material must be applied by a Certified Applicator of the liner manufacturer. A copy of this certification shall be supplied to the Engineer prior to the commencement of the lining portion of the project. All work for and in connection with the installation of the lining in the structure and the field sealing, shall be done in strict conformity with the applicable specifications and the instructions and recommendations of the lining manufacturer. Other applicators may be available to perform the work.

PART 3 - Execution

- A. Before installation of the PVC liner work begins, the Contractor shall clean and clear the main of obstructions such as solids, roots, and other materials which would prevent proper installation of the liner. Internal debris such as sludge, dirt, sand, rocks, grease, and other solid or semi-solid material shall be cleaned out of the main with hydraulic equipment, high velocity jet cleaners, or mechanical equipment. Refuse from this operation shall be accumulated and removed from the system at the downstream manhole and be hauled to the waste water treatment plant no less than once a day. Accumulations of the debris on the surface or transfer of the refuse to downstream portions of the sewage collection system shall not be permitted. Sanitary sewer mains contaminated with debris from the Contractor's upstream operations shall be cleaned and cleared of debris by the Contractor at the Contractor's sole expense to the satisfaction of the Owner and the Engineer, or the Owner may, with its own, or other hired forces, clean the contaminated sections and withhold such monies from the next partial payment due the Contractor for work completed on the project. Precautions shall be taken to ensure that sewer lines are not damaged during the cleaning operations or that flooding to public or private property results. The contractor shall bear the sole expense of damage to public or private property.
- B. Where indicated on the plans or directed by the Engineer or discovered in the field during the scrutinization processes described below, the Contractor shall route protruding services flush with the wall of the sewer main. The routing shall be accomplished by mechanical means which shall not damage the main. Thirteen protruding services have been identified at various locations throughout the project.
- C. Where indicated on the plans or directed by the Engineer, the Contractor shall abandon existing manholes in place. The Contractor shall line through the manhole with the liner, fill the manhole with control density backfill, remove the ring and cover, and restore the surface to the condition of the surrounding existing conditions. No manholes are contemplated for abandonment in place on this project.
- D. The Contractor shall scrutinize the mains to determine breaks, obstacles, and service connections by remote mechanical processes. A DVD and log of the inspection shall be processed by the Contractor and two (2) copies shall be submitted to the Engineer for delivery to the Owner. A reconnaissance survey has been performed by the Owner to aid in allocating resources for this project. The logs of this survey are available for inspection at the office of the Engineer with the prior consent of the Engineer. Copies may be checked out

and returned within a short period of time. However, since the Owner does not possess the specialized equipment available to the Contractor, the results of these surveys are not complete or all encompassing but were made solely for the design of the project and may not represent the condition of the mains. Consequently, the Contractor shall remotely inspect and record his findings for the contemplation of the Owner and the Engineer prior to proceeding with the installation of the liner or performing point repairs. The labor, materials, equipment, and ancillary items required to clean the line and provide the video inspections items shall be considered subsidiary to other contract work items and separate measure or payment shall not be made.

- E. If the inspection reveals obstructions such as protruding service connections, displaced joints, broken or missing pipes, or a pipe collapse which cannot be cleared with internal methods and will prevent the proper installation of the liner, then the Contractor shall excavate the distressed location in conformance with these contract documents, make a point repair of the main utilizing SDR 26 D-3034 sewer pipe, the appropriate Femco, or equal, couplings, necessary PVC wyes, and PVC SDR 26 service pipe of the appropriate size, and backfill and compact the excavation in conformance with Section 02530. Point repairs shall be a short term activity which shall be initiated and completed in one working day. Base shall be restored to allow vehicular access and the surfacing restored promptly. The Contractor shall provide excavation and suitable backfill as required to install the system. At each end of the point repair, the coupling shall be encased in "control density backfill" which shall be allowed to solidify and cure prior to backfill to prevent joint movement. This will include removing any unsuitable backfill material from the site. The work shall be approved by the Owner's representative prior to initiating it.
- F. Temporary plugs at the ends of existing sewer mains in existing manholes shall be required to effectively handle existing effluent flows. The contractor shall be responsible for providing the means to divert existing flows around the work site from manhole to manhole to allow the construction of the improvements to be performed in dry conditions. The Contractor shall be responsible for cleansing required or treatments necessary to install the PVC liner. The labor, materials, equipment, and ancillary items required to provide these temporary plugs, pumps, or other items shall be considered subsidiary to other contract work items and separate measurement or payment shall not be made.
- G. Sanitary sewer services shall be maintained throughout the rehabilitation process. Portable toilets shall be supplied and maintained by the Contractor for the users to ensure continuous service is available if required by the Owner. The Contractor shall contact and maintain communications with the users of the sanitary sewer mains undergoing rehabilitation. Written notice shall be supplied to each user describing the work schedule, a Contractor contact for the user along with a phone number for the contact, and the effects of the work the user may be expected to experience. On the day the main is lined the user shall be contacted and advised of the specifics required of the user such as running clean water through the house service to confirm the active lateral and the length of time no effluent shall be permitted from the facility. Communications with users, written notices to users, and coordination of the user's requirements including providing necessary temporary sanitary facilities by the Contractor shall be considered incidental to the pipelining work and shall not be paid for separately but shall be considered merged with the unit cost bid to line the pipe.

Installation of the liner shall not commence until the substrate has properly cured in accordance with these specifications and the liner manufacturer's written recommendations.

- H. The entrance to the host pipe shall be covered so as to provide a smooth surface to prevent damage to the pipeliner. The insertion end of the pipeliner shall be sealed to inhibit fluids and solids from entering the pipeliner. The liner shall be slowly fed into entry manhole from the supply reel, while simultaneously pulling the pipeliner at the exit manhole, to minimize tension on the pipeliner. Maintain two-way communication between personnel at entry and exit manholes to coordinate the rate of pipeliner supply and pulling operations. A power winch and a steel cable connected to the pulling head may be used as recommended by the manufacturer to advance the pipeliner.
- I. Process the pipeliner in accordance with the manufacturer's instructions for heating and expanding the pipeliner. Upon completion of processing, the pipeliner shall fit tightly against the inside wall of the host pipe, be locked into the joints of the host pipe, and have distinct dimples at the locations of existing service connections to the host pipe. Temperature and pressure gauges shall be used at the insertion and termination manholes to monitor internal conditions during pipeliner processing and molding. **DO NOT ALLOW PRESSURE TO EXCEED 12 PSI, AS DAMAGE MAY OCCUR TO HOST PIPE.**
- J. The live service connections shall be reinstated using remote controlled methods as approved by the manufacturer or as otherwise approved by the Engineer. After creating a hole in the pipeliner, polish the edges of the resulting hole to remove sharp edges and to improve flow conditions from the service lateral into the lined sewer main.
- K. A watertight seal at the insertion and termination points in the manholes shall be provided in accordance with the manufacturer's recommendations. Neatly cut off the pipeliner to a minimum of 3" to 4" from the manhole wall. Provide a mortar/concrete bench adjacent to the pipeliner segment within the manhole to support the pipeliner sidewalls and to provide for smooth merging of flows from other pipelines.
- L. The Contractor shall perform an internal video inspection of the completed pipeliner and the restored service connections. The camera shall have an accurate footage counter which shall display on the monitor the exact distance of the camera from the center line of the starting manhole. A final visual inspection shall be made by the Contractor and manufacturer's representative. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by the Contractor. Two (2) copies of the final video inspection on DVD prepared and processed by the Contractor shall be supplied to the Engineer for delivery to the Owner. Defects detected with the aid of the final video process shall promptly be rectified to the satisfaction of the Engineer by the Contractor.

END OF SECTION