CITY OF FORT LAUDERDALE

CONTRACT AND SPECIFICATIONS PACKAGE

BID/EVENT NO. 226

PROJECT NO. P12464-B

Tarpon River A-11 Sewer Basin Rehabilitation Phase 2

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Description **Pages**

ATTACHMENTS

Note: **The following documents are available electronically for completion and must be returned with your bid along with your bid security, proof of insurance, and proof of required licenses/certifications.**

CITB Questionnaire Sheet
CITB Specific References
CITB Trench Safety
Non-Collusion Statement
Non-Discrimination Certification Form
E-Verify Statement
Contract Payment Method
Construction Bid Certification Page
Affidavit of Compliance with Foreign Entity Laws

INVITATION TO BID

Sealed bids will be received electronically until **2:00 p.m.**, local time, on **February 13, 2024,** and opened online immediately thereafter for **BID/EVENT NO., 226, PROJECT NO., P12464-B, Tarpon River A-11 Sewer Basin Rehabilitation**.

All openings will be held on the City's online strategic sourcing platform. Once the Procurement Specialist opens the solicitation, the bid tabulations may be viewed immediately on a computer, laptop, cell phone, or any other device with Wi-Fi access. In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

Anyone requesting assistance or having further inquiry in this matter must contact the Procurement Specialist indicated in the solicitation, via the Question and Answer (Q&A) forum on the City's online strategic sourcing platform before the Last Day for Questions indicated in the Solicitation.

This project is in the Neighborhood of Tarpon River within the following boundaries: S New River Dr in the north, SW Flagler Av in the west, SE 6th Av in the east, and SW 7th St in the south, in the City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, main lines lining, service laterals lining, new clean out installations (in asphalt, concrete, grass or rocks), clean out repairs, root removal, grease removal, double stack laterals lining, sectional liner installation, CCTV and repair recommendations, dye water testing, and incidental restoration repairs such as asphalt, grass, pavers, pavement markings, tree removals and minor landscaping.

Drawing Plans: There are no drawing plans for this Project.

Licensing Requirements:

1. The selected Contractor must possess an underground utility and excavation license, or a Broward County Primary Pipeline license, and/or a Certified General Contractor's license.

2. The Contractor's CCTV Operator must possess NASSCO (National Association of Sewer Service Companies) PACP (Pipeline Assessment & Certification Program)/LACP (Lateral Assessment & Certification Program)/MACP (Manhole Assessment & Certification Program) certifications.

NOTE: Payment on this contract will be made by check.

Pre-Bid Meeting/Site visit: There will not be a pre-bid meeting and/or site visit for this Invitation to Bid.

However, it will be the sole responsibility of the bidder to inspect the City's location(s)/facilities and become familiar with the scope of the City's requirements and systems prior to submitting a bid. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the bidder has familiarized himself with the nature and extent of the work, equipment, materials, and labor required.

Bid Security: A certified check, cashier's check, bank officer's check or bid bond for **FIVE percent (5%)** of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each offer.

Bid Bonds:

Bidders can submit bid bonds **three** different ways.

1) Bidders may submit bid bonds **electronically** directly through the City's online strategic sourcing platform using **Surety 2000**.

2) Bidders may **upload** their original executed bid bond on the City's online strategic sourcing platform to accompany their electronic bids, and **mail** the original, signed and sealed hard copy to the Finance Department, Procurement Services Division, 521 NE 4th Avenue, Fort Lauderdale, Florida 33301-1016, **within five (5) business days** after bid opening, with the company name, bid number and title clearly indicated on the envelope.

3) Bidders can **mail** their bid bond to the Finance Department, Procurement Services Division, 521 NE 4th Avenue, Fort Lauderdale, Florida 33301-1016, **before time of bid opening**, with the company name, bid number and title clearly indicated on the envelope. NOTE: Bond must be received in Procurement and time stamped before bid opening.

It will be the sole responsibility of the bidder to ensure that its bid is submitted prior to the bid opening date and time listed. **PAPER BID SUBMITTALS WILL NOT BE ACCEPTED. BIDS MUST BE SUBMITTED ELECTRONICALLY VIA THE CITY'S ONLINE STRATEGIC SOURCING PLATFORM.**

Certified Checks, Cashier's Checks and Bank Drafts:
These **CANNOT** be submitted via the City's online strategic souring platform, nor are their images allowed to be uploaded and submitted with your electronic bid. These forms of securities, as well as hard copy bid bonds, must be received on or before the Invitation to Bid (ITB) opening date and time, at the Finance Department, Procurement Services Division, 521 NE 4th Avenue, Fort Lauderdale, Florida 33301-1016, with the bid number and title clearly indicated on the envelope.

It is the bidder's sole responsibility to ensure that its bid bond or other bid security is received by the Procurement Services Division before the time of bid opening. Failure to adhere to this requirement may be grounds to consider the bid as non-responsive.

The City of Fort Lauderdale reserves the right to waive any informality in any or all bids and to reject any or all bids.

For information concerning technical specifications, please utilize the Q&A platform provided on the City's online strategic sourcing platform. Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures, will only be transmitted by written addendum. **Bidders please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the bidder has familiarized himself with the nature and extent of the work, equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation.

Information on bid results and projects currently out to bid can be obtained on the City's website – https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services
For general inquiries, please call (954) 828-5933.

INSTRUCTIONS TO BIDDERS

The following instructions are given for the purpose of guiding bidders in properly preparing their bids or proposals. These directions have equal force and weight with the specifications, and strict compliance is required with all of these provisions.

QUALIFICATIONS OF BIDDERS – No bid will be accepted from, nor will any contract be awarded to, any person who is in arrears to the City of Fort Lauderdale, upon any debt or contract, or who has defaulted, as surety or otherwise, upon any obligation to the City, or who is deemed irresponsible or unreliable by the City Commission of Fort Lauderdale.

CONCERNING SUB-CONTRACTORS, SUPPLIERS, AND OTHERS - The amount of work that is sublet by the Bidder shall be limited by the condition that the Bidder shall, with his own organization, perform at least forty percent (40%) of the total dollar amount of the Work to be performed under the Agreement.

PERSONAL INVESTIGATION - Bidders shall satisfy themselves by personal investigation, and by such other means as they may think necessary or desirable, as to the conditions affecting the proposed work and the cost. No information derived from maps, plans, specifications, or from the Engineer or City staff shall relieve the Contractor from any risk or from fulfilling all terms of the contract.

INCONSISTENCIES – Any inconsistency between different provisions of the plans, specifications, bid or contract, or any point requiring explanation must be inquired by the bidder, in writing, at least ten (10) days prior to the time set for opening bids. After bids are opened, the bidders shall abide by the decision of the Engineer as to such interpretation.

ADDENDA AND INTERPRETATIONS - No interpretations of the meaning of the plans, specifications or other contract documents will be made orally to any bidder. Prospective bidders must request such interpretation in writing as instructed in the bid package. To be considered, such request must be received by the Questions and Answers deadline as indicated in the City's online strategic sourcing platform. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. **It is the bidder's responsibility to verify if addenda have been issued in the City's online strategic sourcing platform.** Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become a part of the contract document. **Bidder** shall verify in the City's online strategic sourcing platform that it has all addenda before submitting a bid.

LEGAL CONDITIONS - Bidders are notified to familiarize themselves with the provisions of the laws of the State of Florida relating to hours of labor on municipal work, and with the provisions of the laws of the State of Florida and the Charter and the ordinances of the City of Fort Lauderdale.

PUBLIC ENTITY CRIMES - A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for Category Two for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

FORMS OF BIDS - Each bid and its accompanying statements MUST BE SUBMITTED ELECTRONICALLY, IN GOOD ORDER WITH ALL BLANKS COMPLETED, and must show the name of the bidder and a statement as to its contents. In the event of any conflict or discrepancy between bid

price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

The bid must be signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the bid. No bid will be accepted, for any reason whatsoever, which is not submitted to the City as stated above, within the specified time.

INSURANCE - Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida.

BID BOND - A certified check, cashier's check or bank officer's check made payable to the City of Fort Lauderdale, or a bid bond in favor of the City of Fort Lauderdale shall accompany each bid as evidence of the good faith and responsibility of the bidder. The amount of the check or bond shall be retained by the City as liquidated damages in the event the bidder whose bid is accepted refuses to or fails to enter into a contract for the execution of the work solicited in this Invitation to Bid.

The bid bond or check shall be a guarantee that the successful bidder will promptly execute a contract satisfactory to the City for the work solicited in this Invitation to Bid and furnish good and sufficient bonds.

Following the full execution of a contract for the work solicited in this Invitation to Bid and the successful bidder's provision of good and sufficient bonds, in the event bid security was provided by check, the amount of the bid security accompanying the successful bidder's bid will be refunded to the successful bidder, or in the event bid security was provided by a bond, the bond accompanying the successful bidder's bid will be returned to the successful bidder. In the event the successful bidder fails to enter into, execute, and deliver a contract and furnish the required bonds within ten (10) days after the City provides notice to the successful bidder to deliver the executed contract and the required bonds, the bid bond shall immediately be payable to the City of Fort Lauderdale, or in the case of a check, the City shall retain the amount of the check, as liquidated damages. The City's retention of such amount shall not be construed as a penalty or forfeiture.

FILLING IN BIDS - All prices must be electronically submitted in the bid pages, and bids must fully cover all items for which prices are asked and no other. Where more than one person is interested, it is required that all persons interested or their legal representative make all verification and subscribe to the bid. In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

PRICES QUOTED: Deduct any discount offered and quote firm net unit prices. In the case of a discrepancy in computing the amount of the bid, the unit price quoted will govern. All prices quoted shall be F.O.B. destination, freight prepaid (Bidder pays and bears freight charges, Bidder owns goods in transit and files any claims), unless otherwise stated in Special Conditions. Each item must be bid

separately. No attempt shall be made to tie any item or items contained in the ITB with any other business with the City.

BIDS FIRM FOR ACCEPTANCE: Bidder warrants, by virtue of bidding, that his bid and the prices quoted in his bid will be firm for acceptance by the City for a period of one hundred and twenty (120) days from the date of bid opening unless otherwise stated in the ITB. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

ADDITIONAL ITEMS OR SERVICES: The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Contractor agrees to provide such items or services and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Contractor thirty (30) days written notice.

DELETION OR MODIFICATION OF SERVICES: The City reserves the right to delete any portion of the Contract at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished on the portion of the Contract to be deleted, the Contractor shall be paid for the deleted portion on the basis of the estimated percentage of completion of such portion.

If the Contractor and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Contractor will submit a revised cost to the City for approval prior to proceeding with the work.

TERMINATION FOR UNAPPROPRIATED FUNDS**:** The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the contract into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

CAUSES FOR REJECTION - No bid will be canvassed, considered or accepted which, in the opinion of the City is informal or unbalanced, or contains inadequate or unreasonable prices for any items. Each item must carry its own proportion of the cost as nearly as is practicable. Any alteration, erasure, interlineation, or failure to specify bids for all items called for in the schedule shall render the bid informal.

REJECTION OF BIDS - The City reserves the right to reject any bid if the evidence submitted by the bidder, or if the investigation of such bidder, fails to satisfy the City that such bidder is properly qualified to carry out the obligations and to complete the work contemplated. Any or all bids will be rejected, if there is reason to believe that collusion exists among bidders. A bid will be considered irregular and may be rejected, if it shows serious omissions, alterations in form, additions not called for, conditions or unauthorized alternates, or irregularities of any kind. The City reserves the right to reject any or all bids and to waive such technical errors as may be deemed best for the interests of the City.

BID PROTEST PROCEDURE: Any bidder who is not recommended for award of a contract and who alleges a failure by the City to follow the City's procurement ordinance or any applicable law may protest to the Procurement Division – Deputy Director of Finance, by delivering a letter of protest within five (5) days after a Notice of Intent to award is posted on the City's website at the following link: https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services/notices-of-intent-to-award

The complete protest ordinance may be found on the City's website at the following link: https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-182DIREPRAWINAW

WITHDRAWALS - Any bidder may, without prejudice to himself, withdraw its bid at any time prior to the expiration of the time during which bids may be submitted. Such request for withdrawal must be in writing and signed in the same manner and by the same person who signed the bid. After expiration of the period for receiving bids, no bids can be withdrawn, modified, or explained.

CONTRACT - The bidder to whom award is made shall execute a written contract to do the work and maintain the same in good repair until final acceptance by the proper authorities and shall furnish good and sufficient bonds as specified within ten (10) days after receiving such contract for execution. If the bidder to whom the first award is made fails to enter into a contract as provided, the award may be annulled and the contract let to the next lowest bidder who is responsive and responsible, and that bidder shall fulfill every stipulation and obligation as if such bidder were the original party to whom award was made.

The contract shall provide that the Contractor agrees to correct any defective or faulty work or material, which may appear within one (1) year after completion of the work and receipt of final payment.

ENFORCEMENT OF SPECIFICATIONS - Copies of the specifications will be placed in the hands of all the assistants to the Engineer and Inspectors employed on the Work, who shall enforce each and every requirement of the contract. Such assistants shall have no authority to vary from such requirements.

DRAWING PLANS - Drawing plans may be obtained **free of charge** from the City's on-line strategic sourcing platform.

SURETY BOND – The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2022), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

The successful bidder shall furnish a performance and payment bond in compliance with Section 255.05, Florida Statutes (2022), written by a Corporate Surety company, holding a Certificate of Authority from the Secretary of the Treasury of the United States as acceptable sureties on federal bonds, in an amount equal to the total amount payable by the terms of the contract, executed and issued by a Resident Agent licensed by and having an office in the State of Florida, representing such Corporate Surety, conditioned for the due and faithful performance of the work, and providing in addition to all other conditions, that if the Contractor, or his or its subcontractors, fail to duly pay for any labor, materials, or other supplies used or consumed by such Contractor, or his or its subcontractor or subcontractors, in performance of the work contracted to be done, the Surety will pay the same in the amount not exceeding the sum provided in such bonds, together with interest at the rate of fifteen percent (15%) per annum, and that they shall indemnify and hold harmless the City of Fort Lauderdale to the extent of any and all payments in connection with carrying out of the contract, which the City may be required to make under the law.

The Contractor is required at all times to have a valid surety bond in force covering the work being performed. A failure to have such bond in force at any time shall constitute a default on the part of the Contractor. A bond written by a surety, which becomes disqualified to do business in the State of Florida, shall automatically constitute a failure on the part of the Contractor to meet the above requirements.

Such bond shall continue in effect for one (1) year after completion and acceptance of the work with liability equal to at least twenty-five percent (25%) of contract price, or an additional bond shall be conditioned that the Contractor will correct any defective or faulty work or material which appear within one (1) year after completion of the contract, upon notification by the City, except in contracts which are concerned solely with demolition work, in which cases twenty-five percent (25%) liability will not be applicable.

AUDIT OF CONTRACTOR'S RECORDS - Upon execution of the Contract, the City reserves the right to conduct any necessary audit of the Contractor's records. Such an audit, or audits, may be conducted by the City or its representatives at any time prior to final payment, or thereafter, for a period up to three (3) years. The City may also require submittal of the records from either the Contractor, the Subcontractor, or both. For the purpose of this Section, records shall include all books of account, supporting documents and papers deemed necessary by the City to assure compliance with the contract provisions.

Failure of the Contractor or Subcontractor to comply with these requirements may result in disqualification or suspension from bidding for future contracts or disapproval as a Subcontractor at the option of the City.

The Contractor shall assure that each of its Subcontractors will provide access to its records pertaining to the project upon request by the City.

PERIODIC ESTIMATE FOR PARTIAL PAYMENT - After the Contractor has submitted a periodic estimate for partial payment, approved and certified by the Public Works Department, the City shall make payment in the manner provided in the Contract Documents and in accordance with Florida's Prompt Payment Act, Section 218, Florida Statutes (2022).

RESERVATION FOR AWARD AND REJECTION OF BIDS - The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City. The City reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the ITB and whose bid is considered to best serve the City's interest. In determining the responsiveness of the offer and the responsibility of the Bidder, the following shall be considered when applicable: the ability, capacity and skill of the Bidder to perform as required; whether the Bidder can perform promptly, or within the time specified, without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the Bidder; the quality of past performance by the Bidder; the previous and existing compliance by the Bidder with related laws and ordinances; the sufficiency of the Bidder's financial resources; the availability, quality and adaptability of the Bidder's supplies or services to the required use; the ability of the Bidder to provide future maintenance, service or parts; the number and scope of conditions attached to the bid.

LOCAL BUSINESS PREFERENCE **-** Section 2-186, Code of Ordinances of the City of Fort Lauderdale, provides for a local business preference. In order to be considered for a local business preference, a proposer must include the Local Business Preference Certification Statement of this ITB, as applicable to the local business preference class claimed at the time of Bid submittal:

Upon formal request of the City, based on the application of a Local Business Preference, the Proposer shall, within ten (10) calendar days, submit the following documentation to the Local Business Preference Class claimed:

a. Copy of City of Fort Lauderdale current year business tax receipt, or Broward County current year business tax receipt, and

b. List of the names of all employees of the proposer and evidence of employees' residence within the geographic bounds of the City of Fort Lauderdale or Broward County, as the case may be, such as current Florida driver license, residential utility bill (water, electric, telephone, cable television), or other type of similar documentation acceptable to the City.

Failure to comply at time of bid submittal shall result in the Proposer being found ineligible for the local business preference.

Definitions:

a. The term "Class A business" shall mean any business that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the city, and shall maintain a staffing level for the proposed work of at least fifty percent (50%) who are residents of the City of Fort Lauderdale.

b. The term "Class B business" shall mean any business that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the city, or shall maintain a staffing level for the proposed work of at least fifty percent (50%) who are residents of the City of Fort Lauderdale.

c. The term "Class C business" shall mean any business that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of Broward County.

c. The term "Class D business" shall mean any business that does not qualify as a Class A, Class B, or Class C business.

The complete local business preference ordinance may be found on the City's web site at the following link:
https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-186LOBUPR

DISADVANTAGED BUSINESS ENTERPRISE PREFERENCE - Section 2-185, Code of Ordinances of the City of Fort Lauderdale, provides for a disadvantaged business preference. In order to be considered for a disadvantaged business preference, a proposer must include a certification from a government agency, as applicable to the disadvantaged business preference class claimed at the time of Bid submittal:

Upon formal request of the City, based on the application of a Disadvantaged Business Preference the Proposer shall within ten (10) calendar days submit the following documentation to the Disadvantaged Business Enterprise Preference Class claimed:

a. Copy of City of Fort Lauderdale current year business tax receipt, or the Tri-County (Broward, Dade, West Palm Beach) current year business tax receipt, or proof of active Sunbiz status and

b. List of the names of all employees of the proposer and evidence of employees' residence within the geographic bounds of the City of Fort Lauderdale or the Tri-County, as the case may be, such as current Florida driver license, residential utility

bill (water, electric, telephone, cable television), or other type of similar documentation acceptable to the City.

Failure to comply at time of bid submittal shall result in the Proposer being found ineligible for the Disadvantaged Business Enterprise Preference business preference.

The complete Disadvantaged Business Preference ordinance may be found on the City's website at the following link: https://www.fortlauderdale.gov/home/showpublisheddocument?id=56883

DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS - The bidder or proposer certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any Federal department or agency.

LOBBYING ACTIVITIES - **ALL CONTRACTORS PLEASE NOTE**: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-11-42 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No., C-11-42, and Resolution No. 07-101, may be obtained from the City Clerk's Office on the 7th Floor of City Hall, 100 N. Andrews Avenue, Fort Lauderdale, Florida 33301. The Ordinance may also be viewed on the City's website at https://www.fortlauderdale.gov/home/showdocument?id=6036.

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GENERAL CONDITIONS

Unless otherwise modified in the Project's Special Conditions, the following General Conditions shall be part of the Contract:

GC - 01 - DEFINITIONS - The following words and expressions, or pronouns used in their stead, shall wherever they appear in the Contract and the Contract Documents, be construed as follows:

"Addendum" or "Addenda" - shall mean the additional Contract provisions issued in writing, by the Engineer, prior to the receipt of bids.

"Bid" – shall mean the offer or bid of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

"Bidder" – shall mean any person, firm, company, corporation or entity submitting a bid for the Work.

"Bonds" –shall mean bid, performance and payment bonds and other instruments of security, furnished by Contractor and his surety in accordance with the Contract Documents.

"City" – shall mean the City of Fort Lauderdale, Florida, a Florida municipal corporation. In the event the City exercises its regulatory authority as a government body, the exercise of such regulatory authority and the enforcement of any rules, regulations, codes, laws and ordinances shall be deemed to have occurred pursuant to City's authority as a governmental body and shall not be attributable in any manner to the City as a party to this Contract.

"Consultant" – shall mean a person, firm, company, corporation or other entity employed by the City to perform the professional services for the project.

"Contractor" – shall mean the successful Bidder who has been employed by the City to perform the construction and related services for the project.

"Contract Work" - shall mean everything expressed or implied to be required to be furnished and furnished by the Contractor by any one or more of the parts of the Contract Documents referred to in the Contract hereof. In the case of any inconsistency in or between any parts of this Contract, the Project Manager shall determine which shall prevail.

"Design Documents" – shall mean the construction plans and specifications included as part of a Bid Solicitation prepared either by the City or by the Consultant under a separate Agreement with the City.

"Engineer" - shall include the terms "professional engineer" and "licensed engineer" and means a person who is licensed to engage in the practice of engineering under Florida Statute, Chapter 471. An Engineer may be a City employee or a consultant hired by the City.

"Extra Work" - shall mean work other than that required by the Contract.

"Inspector" – shall mean an authorized representative of the City assigned to make necessary inspections of materials furnished by Contractor and of the Work performed by Contractor.

"Notice" - shall mean written notice sent by certified United States mail, return receipt requested, or sent by commercial express carrier with acknowledgement of delivery, or via fax or email, or by hand delivery with a request for a written receipt of acknowledgment of delivery and shall be served upon the Contractor either personally or to its place of business listed in the Bid.

“Owner” - shall mean the City of Fort Lauderdale.

“Project Manager” - shall mean a professional designated by the City to manage the Project under the supervision and direction of the Public Works Director or designee.

"Public Works Director" – shall mean the Public Works Director of the City of Fort Lauderdale.

"Site" - shall mean the area upon or in which the Contractor's operations are carried out and such other areas adjacent thereto as may be designated as such by the Project Manager.

"Sub-contractor" - shall mean any person, firm, company, corporation or other entity, other than employees of the Contractor, who or which contracts with the contractor, to furnish, or actually furnishes labor and materials, or labor and equipment, or labor, materials and equipment at the site.

"Surety" - shall mean any corporation or entity that executes, as Surety, the Contractor's performance and payment bond securing the performance of this Contract.

GC - 02 - SITE INVESTIGATION AND REPRESENTATION - The Contractor acknowledges that it has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Site, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, field conditions, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

The Contractor acknowledges that it has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor’s experts, has determined that no conditions exist that would in any manner affect the Bid Price and that the project can be completed for the Bid Price submitted.

Any failure by the Contractor to acquaint itself with all the Site conditions shall not relieve Contractor from responsibility for properly estimating the difficulty or cost thereof under the Contract Documents.

GC - 03 - SUBSTITUTIONS - If the Contractor desires to use materials and/or products of manufacturer's names different from those specified in the Contract Documents, the Bidder requesting the substitution shall make written application as described herein. The burden of proving the equality of the proposed substitution rests on the Contractor making the request. To be acceptable, the proposed substitution shall meet or exceed all expressed requirements of the Contract Documents and shall be submitted upon the Contractor's letterhead. The following requirements shall be met in order for the substitution to be considered:

1. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Project Manager will consider reports from

reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and

2. Requests for substitution shall completely and clearly indicate in what respects the materials and/or products differ from those indicated in the Contract Documents; and

3. Requests for substitution shall be accompanied by the manufacturer's printed recommendations clearly describing the installation, use and care, as applicable, of the proposed substitutions; and

4. Requests for substitution shall be accompanied by a complete schedule of changes in the Contract Documents, if any, which must be made to permit the use of the proposed substitution.

If a proposed substitution is approved by the Project Manager, an addendum will be issued to prospective bidders not less than three (3) working days prior to the date set for opening of bids. Unless substitutions are received and approved as described above, the successful Bidder shall be responsible for furnishing materials and products in strict accordance with the Contract Documents.

GC- 04 – CONSTRUCTION RESOURCES – Contractor shall provide all labor and equipment necessary to complete the installation within a timely manner. Contractor shall provide details as to manpower and equipment to be dedicated to the project in its Work Plan. Contractor is responsible for making arrangements, obtaining and purchasing construction water services if required to complete the work.

GC - 05 - CONTROL OF THE WORK - The Project Manager shall have full control and direction of the Work in all respects. The Project Manager and/or his authorized designee(s) shall, at all times, have the right to inspect the Work and materials. The Contractor shall furnish all reasonable facilities for obtaining such information, as the Project Manager may desire respecting the quality of the Work and materials and the manner of conducting the Work. Should the Contractor be permitted to perform night Work, or to vary the period which work is ordinarily carried on in the daytime, he shall give ample notice to the Project Manager so that proper and adequate inspection may be provided. Such Work shall be done only under such regulations as are furnished in writing by the Project Manager, and no extra compensation shall be allowed to the Contractor therefore. In the event of night work, the Contractor shall furnish such light, satisfactory to the Project Manager, as will ensure proper inspection. Nothing herein contained shall relieve the Contractor from compliance with any and all City ordinances relating to noise or Work during prohibited hours.

GC - 06 - SUB-CONTRACTOR - The Contractor shall not sublet, in whole or any part of the Work without the written consent and approval of the Project Manager. Within ten (10) days after official notification of starting date, the Contractor must submit in writing, to the Project Manager, a list of all Sub-contractors. No Work shall be done by any sub-contractor until such Sub-contractor has been officially approved by the Project Manager. A sub-contractor not appearing on the original list will not be approved without written request submitted to the Project Manager and approved by the Public Works Director. In all cases, the Contractor shall give his personal attention to the Work of the Sub-contractors and the Sub-contractor is liable to be discharged by the Contractor, at the direction of the Project Manager, for neglect of duty, incompetence or misconduct.

Acceptance of any sub-contractor, other person, or organization by the Project Manager shall not constitute a waiver of any right of Project Manager to reject defective Work or Work not in conformance with the Contract Documents.

Contractor shall be fully responsible for all acts and omissions of its Sub-contractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for

whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between City and any sub-contractor or other person or organization having a direct contract with Contractor, nor shall it create any obligation on the part of City to pay or to see to the payment of any moneys due to any sub-contractor or other person, or organization, except as may otherwise be required by law.

GC - 07 - QUANTITIES - Contractor recognizes and agrees that the quantities shown on plans and Bid/Price Schedule are estimates only and may vary during actual construction. No change shall be made involving any departure from the general scheme of the Work and that no such change involving a material change in cost, either to the City or Contractor, shall be made, except upon written permission of the City. However, the Project Manager shall have the right to make minor alternations in the line, grade, plan, form or materials of the Work herein contemplated any time before the completion of the same. That if such alterations shall diminish the quantity of the Work to be done, such alterations shall not constitute a claim for damages or anticipated profits. That if such alterations increase the amount of the Work to be done, such increase shall be paid for according to the quantity actually performed and at the unit price or prices stipulated therefore in the Contract. The City shall, in all cases of dispute, determine the amount or quantity of the several kinds of Work which are to be paid for under this Contract, and shall decide all questions relative to the execution of the same, and such estimates and decisions shall be final and binding.

Any Work not herein specified, which might be fairly implied as included in the Contract, of which the City shall judge, shall be done by the Contractor without extra charge. However, such cost increases shall be authorized either by the Public Works Director or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

GC - 08 - NO ORAL CHANGES - Except to the extent expressly set forth in the Contract, no change in, or modification, termination or discharge of the Contract in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the parties charged, therewith or their duly authorized representative.

GC - 09 - PERMITS AND PROTECTION OF PUBLIC – Permits on file with the City and/or those permits to be obtained by the Contractor, shall be considered directive in nature, and will be considered a part of this Contract. A copy of all permits shall be given to the City and become part of the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

Contractor shall secure all permits and licenses required for completing the Project. Contractor will obtain the necessary State, County, and City construction/work permits if required.

The Contractor shall comply with all applicable Codes, Standards, Specifications, etc. related to all aspects of the Project.

Where there are telephones, light or power poles, water mains, conduits, pipes or drains or other construction, either public or private, in or on the streets or alleys, the Work shall be so conducted that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given to all affected parties prior to proceeding with the Work.

The Contractor shall not be permitted to interfere with public travel and convenience by grading or tearing up streets indiscriminately, but the Work of constructing the various items in this contract shall proceed in an orderly, systematic and progressive manner.

GC - 10 - DISEASE REGULATIONS - The Contractor shall enforce all sanitary regulations and take all precautions against infectious diseases as the Project Manager may deem necessary. Should any infectious or contagious diseases occur among his employees, he shall arrange for the immediate removal of the employee from the Site and isolation of all persons connected with the Work.

GC - 11 - CONTRACTOR TO CHECK PLANS, SPECIFICATIONS, AND DATA - The Contractor shall verify all dimensions, quantities, and details shown on the plans, supplementary drawings, schedules, and shall notify the Project Manager of all errors, omissions, conflicts and discrepancies found therein within three (3) working days of discovery. Failure to discover or correct errors, conflictions, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction, or improper operation resulting therefrom nor from rectifying such condition at its own expense.

GC - 12 - MATERIALS AND WORKMANSHIP - All material shall be new and the workmanship shall, in every respect, be in conformity with approved modern practice and with prevailing standards of performance and quality. In the event of a dispute, the Project Manager's decision shall be final. Wherever the Plans, Specifications, Contract Documents, or the directions of the Project Manager are unclear as to what is permissible and/or fail to note the quality of any Work, that interpretation will be made by the Project Manager, which is in accordance with approved modern practice, to meet the particular requirements of the Contract.

GC - 13 - SAFEGUARDING MARKS - The Contractor shall safeguard all points, stakes, grade marks, monuments, and benchmarks made or established on the Work, bear the cost of re-establishing same if disturbed, or bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting or for removing without authorization, such established points, stakes and marks. The Contractor shall safeguard all existing and known property corners, monuments and marks not related to the Work and, if required, shall bear the cost of having them re-established by a licensed Professional surveyor registered in the State of Florida if disturbed or destroyed during the course of construction.

GC - 14 - RESTROOM FACILITIES - Contractor shall provide portable toilet facilities for employee's use at a location within the Work site to be determined by the City.

GC - 15 - PROGRESS MEETINGS - Weekly Status meetings will be conducted with representatives from the City and the Contractor. Contractor shall budget time to participate in such meetings. A well-run Project should result in short meetings.

GC - 16 - ISSUE RESOLUTION - Should Contractor become engaged in a dispute with a resident or a City employee, the Contractor shall report the situation to the Project Manager immediately. It shall be mandatory that the City participate in any dispute resolution. Failure of Contractor personnel to notify the City shall obligate Contractor to replace the offending employee immediately if requested by the City.

GC - 17 - CITY SECURITY-CONTRACTOR AND SUBCONTRACTOR EMPLOYEE INFORMATION - Prior to commencing work, Contractor shall provide to the City a list of all personnel and sub-contractors on site. The list will include the name, address, birth date and driver's license number for all personnel. All personnel and subcontractors on site will have on their person a company photo ID during all stages of the construction. Contractor shall provide standard required personal information per current City procedures.

GC - 18 - POST-CONSTRUCTION SURVEY - The Contractor shall provide as-built survey, sealed and signed by a registered surveyor in the State of Florida, as a condition of final payment.

GC – 19 - KEY PERSONNEL - Contractor shall provide as part of the Work Plan, resumes for all key project personnel providing supervision and project management functions. Resumes shall include work history and years of experience performing this type of work.

GC - 20 - EXISTING UTILITY SERVICE - All existing utility service shall be maintained with a minimum of interruption at the expense of the Contractor.

GC - 21 - JOB DESCRIPTION SIGNS – Contractor, at Contractor's expense, shall furnish, erect, and maintain suitable weatherproof signs on jobs over $100,000 containing the following information:

1. City Seal (in colors)
2. Project or Improvement Number
3. Job Description
4. Estimated Cost
5. Completion Date

Minimum size of sign shall be four feet high, eight feet wide and shall be suitably anchored. The entire sign shall be painted and present a pleasing appearance. Exact location of signs will be determined in the field. Two (2) signs will be required, one at each end of the job. All costs of this work shall be included in other parts of the work.

GC - 22 - FLORIDA EAST COAST RIGHT-OF-WAY - Whenever a City contractor is constructing within the Florida East Coast Railway Company's Right-of-Way, it will be mandatory that the contractor carry bodily injury and property damage insurance in amounts satisfactory to the Florida East Coast Company. This insurance requirement shall be verified by the contractor with the Florida East Coast Company prior to commencing work, and maintained during the life of the Contract.

GC - 23 - ACCIDENTS - The Contractor shall provide such equipment and facilities as are necessary and/or required, in the case of accidents, for first aide services to be provided to a person who may be injured during the project duration. The Contractor shall also comply with the OSHA requirements as defined in the United States Labor Code 29 CFR 1926.50.

In addition, the Contractor must report immediately to the Project Manager every accident to persons or damage to property, and shall furnish in writing full information, including testimony of witnesses regarding any and all accidents.

GC - 24 - SAFETY PRECAUTIONS - Contractor must adhere to the applicable environmental protection guidelines for the duration of a project. If hazardous waste materials are used, detected or generated at any time, the Project Manager must be immediately notified of each and every occurrence. The Contractor shall comply with all codes, ordinances, rules, orders and other legal requirements of public authorities (including OSHA, EPA, DERM, the City, Broward County, State of Florida, and Florida Building Code), which bear on the performance of the Work.

The Contractor shall take the responsibility to ensure that all Work is performed using adequate safeguards, including but not limited to: proper safe rigging, safety nets, fencing, scaffolding, barricades, chain link fencing, railings, barricades, steel plates, safety lights, and ladders that are necessary for the protection of its employees, as well as the public and City employees. All riggings and scaffolding shall be constructed with good sound materials, of adequate dimensions for their intended use, and substantially braced, tied or secured to ensure absolute safety for those required to use it, as well as those in the vicinity. All riggings, scaffolding, platforms, equipment guards,

trenching, shoring, ladders and similar actions or equipment shall be OSHA approved, as applicable, and in accordance with all Federal, State and local regulations.

GC - 25 - DUST PREVENTION - The Contractor shall, by means of a water spray, or temporary asphalt pavement, take all necessary precautions to prevent or abate a dust nuisance arising from dry weather or Work in an incomplete stage. All costs of this Work shall be included in the cost of other parts of the Work.

Should the Contractor fail to abate a dust nuisance the Project Manager may stop the Work until the issue is resolved to the City's satisfaction.

GC - 26 - SITE CLEANUP AND RESTORATION – The Contractor shall remove all debris and unused or discarded materials from the work site daily. Contractor shall clean the work site to remove all directional drilling "Driller's Mud" materials. No "Driller's Mud" residue shall be allowed to remain in the soil or on the surface of the land or vegetation. All debris and drilling materials must be disposed of offsite at an approved location.

The Contractor shall promptly restore all areas disturbed that are outside the Project limits in equal or better condition at no additional cost to the City.

GC - 27 - COURTEOUS BEHAVIOR AND RESPECT FOR RESIDENTS AND PROPERTY – The Contractor and its employees, associates and sub-contractors shall maintain courteous behavior at all times and not engage in yelling, loud music, or other such activities. Contractor's employees shall not leave trash or other discarded items at the Work Site, especially on any private property. In the event complaints arise, Contractor shall immediately remove such offending employees from the project if requested to do so by the Project Manager. Contractor's employees shall not trespass on any private property unless necessary to complete the work but with prior permission from the owner.

Contractor shall notify and obtain permission from the residents 24 hours in advance when planning to work within the resident's property. In addition, Contractor shall notify the resident prior to entering their property to perform work or inspect/investigate the work site. Contractor shall not block residents' driveways unnecessarily. Contractor shall not park equipment on landscaped areas when the vehicle is not needed for the current construction activities. Contractor shall be responsible for repair and/or replacement of all damaged landscaping within 48 hours including repairing vehicle wheel impressions, irrigation systems, lighting systems, structures, or any other items of resident's property. Contractor shall not destroy, damage, remove, or otherwise negatively impact any landscaping within or outside the right-of-way without prior approval from the Project Manager.

GC - 28 - PLACING BARRICADES AND WARNING LIGHTS - The Contractor shall furnish and place, at Contractor's own expense, all barricades, warning lights, automatic blinker lights and such devices necessary to properly protect the work and vehicular and pedestrian traffic. Should the Contractor fail to erect or maintain such barricades, warning lights, etc., the Project Manager may, after 24 hours' notice to the Contractor, proceed to have such barricades and warning lights placed and maintained by City or other forces and all costs incurred thereof charged to the Contractor and may be retained by the City from any monies due, or to become due, to the Contractor.

GC - 29 - TRAFFIC CONTROL - The Contractor shall coordinate all Work and obtain, through the City's Transportation and Mobility Department, Broward County, Florida Department of Transportation, as applicable, any permits required to detour traffic or close any street before starting to work in the road.

All traffic control devices, flashing lights, signs and barricades shall be maintained in working condition at all times and conform to Manual of Uniform Traffic Control Devices (MUTCD), latest edition.

GC - 30 - COORDINATION - The Contractor shall notify all utilities, transportation department, etc., in writing, with a copy to the Project Manager before construction is started and shall coordinate its Work with them. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal, construction and rearrangement operations in order that services rendered by these parties will not be unnecessarily interrupted.

The Contractor shall arrange its Work and dispose of its materials so as to not interfere with the operation of other contractors engaged upon adjacent work, and to join its Work to that of others in a proper manner, and to perform its Work in the proper sequence in relation to that of other contractors as may be directed by the Project Manager.

Each Contractor shall be responsible for any damage done by it or its agents to the work performed by another contractor.

GC - 31 - WATER - Bulk water used for construction, flushing pipelines, and testing shall be obtained from fire hydrants. Contractor shall make payment for hydrant meter at Treasury Billing Office, 1st Floor, City Hall, 100 N. Andrews Avenue. With the paid receipt, contractor can pick up hydrant meter at the utility location office. No connection shall be made to a fire hydrant without a meter connected.

GC - 32 - PROHIBITION AGAINST CONTRACTING WITH SCRUTINIZED COMPANIES - Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, and that it does not have business operations in Cuba or Syria, as provided in Section 287.135, Florida Statutes (2022), as may be amended or revised. The Contractor certifies that it is not on the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2022), as may be amended or revised, and that it is not engaged in a boycott of Israel. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of Section 287.135, Florida Statutes (2022), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2022), as may be amended or revised, or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2022), as may be amended or revised.

By submitting a bid or response, the company, principals, or owners certify that it is not listed on the Scrutinized Companies with Activities in Sudan List or listed on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or is engaged in business operations in Cuba or Syria.

GC - 33 - USE OF FLORIDA LUMBER TIMBER AND OTHER FOREST PRODUCTS - In accordance with Florida Statute 255.20 (3), the City specifies that lumber, timber, and other forest products used for this Project shall be produced and manufactured in the State of Florida if such products are available and their price, fitness, and quality are equal. This requirement does not apply to plywood specified for monolithic concrete forms, if the structural or service requirements for timber for a particular job cannot be supplied by native species, or if the construction is financed in whole or in

part from federal funds with the requirement that there be no restrictions as to species or place of manufacture.

The Bidder affirms by submitting a bid response to this solicitation that they will comply with section 255.20 (3) Florida Statutes.

GC - 34 - PUBLIC RECORDS/TRADE SECRETS/COPYRIGHT: The Proposer's response to the Solicitation is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this Solicitation and the Contract to be executed for this Solicitation, subject to the provisions of Chapter 119.07 of the Florida Statutes.

Any language contained in the Bidder's response to the Solicitation purporting to require confidentiality of any portion of the Bidder's response to the Solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Bidder submits any documents or other information to the City which the Bidder claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Bidder shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Bidder must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Bidder's response to the Solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the bidder agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. In addition, the bidder agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as exempt from disclosure or confidential. Bids purporting to be subject to copyright protection in full or in part will be rejected. The bidder authorizes the City to publish, copy, and reproduce any and all documents submitted to the City bearing copyright symbols or otherwise purporting to be subject to copyright protection.

EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES (2022), TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

Telephone Number: **(954) 828-5002**

Mailing Address: **City Clerk's Office**
100 N. Andrews Avenue
Fort Lauderdale, Florida 33301-1016

E-mail: **prrcontract@fortlauderdale.gov**

Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2022), as may be amended or revised, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this Agreement if the Contractor does not transfer the records to the City.

4. Upon completion of the Agreement, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Agreement, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Agreement, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

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SPECIAL CONDITIONS

01. PURPOSE

The City of Fort Lauderdale, Florida, is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide construction services to repair the sewer system components for the basin serving pump station A-11 for the City's Public Works Department, in accordance with the terms, conditions, and specifications contained in this Invitation to Bid (ITB).

This project is in the Neighborhood of Tarpon River within the following boundaries: S New River Dr in the north, SW Flagler Av in the west, SE 6th Av in the east, and SW 7th St in the south, in the City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, main lines lining, service laterals lining, new clean out installations (in asphalt, concrete, grass or rocks), clean out repairs, root removal, grease removal, double stack laterals lining, sectional liner installation, CCTV and repair recommendations, dye water testing, and incidental restoration repairs such as asphalt, grass, pavers, pavement markings, tree removals and minor landscaping.

02. TRANSACTION FEES

The City uses the City's online strategic sourcing platform INFOR (www.INFOR.com) to distribute and receive bids and proposals. There is no charge to vendors/contractors to register and participate in the solicitation process, nor will any fees be charged to the awarded contractor.

03. SUBMISSION OF BIDS

It is the sole responsibility of the Contractor to ensure that its bid is submitted electronically through the City's online strategic sourcing platform, www.INFOR.com, and that any bid security reaches the City of Fort Lauderdale, Procurement Services Division, 521 NE 4th Avenue, Fort Lauderdale, Florida 33301-1016, in a sealed envelope marked on the outside with the ITB solicitation number and Contractor's name, no later than the time and date specified in this solicitation. **PAPER BID SUBMITTALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.** In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

04. INFORMATION OR CLARIFICATION

For information concerning procedures for responding to this solicitation, contact **Erick Martinez**, **Senior Procurement Specialist**, at (954) 828-4019 or email at emartinez@fortlauderdale.gov. Such contact shall be for clarification purposes only.

provided in the City's online strategic sourcing platform. Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. **Bidders please note**: No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the bidder has familiarized himself with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation. The questions and answers

submitted in the City's online strategic sourcing platform shall become part of any contract that is created from this ITB.

05. CONTRACT TIME

5.1 The Contractor recognizes that TIME IS OF THE ESSENCE. The Work shall commence within **fourteen** (14) calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **two hundred ten** (210) calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **two hundred forty** (240) calendar days after the Substantial Completion date.

06. BID SECURITY

A certified check, cashier's check, bank officer's check or bid bond for **FIVE percent (5%)** of the bid amount, made payable to the City of Fort Lauderdale, shall accompany each offer.

07. REQUIRED LICENSES/CERTIFICATIONS

Contractor must possess the following licenses/certifications to be considered for award:

1. The selected Contractor must possess an underground utility and excavation license, or a Broward County Primary Pipeline license, and/or a Certified General Contractor's license.

2. The Contractor's CCTV Operator must possess NASSCO (National Association of Sewer Service Companies) PACP (Pipeline Assessment & Certification Program)/LACP (Lateral Assessment & Certification Program)/MACP (Manhole Assessment & Certification Program) certifications.

Note: Contractor must have proper licensing and shall submit evidence of same with its bid response.

08. SPECIFIC EXPERIENCE REQUIRED

The following expertise is required to be considered for this Contract. Specific references attesting to this expertise must be submitted with the bid response.

The contractor shall have at least ten (10) years' previous construction experience in providing construction services as it relates specifically to sanitary sewer rehabilitation in the State of Florida. Bidder shall submit proof of construction experience for a minimum of three (3) projects of similar scope and scale (or larger) and shall, for each project listed, identify location; dates of construction; project name and scope; scope of work that was self-performed by the contractor; and client's name, address, telephone number and e-mail address.

Contractor must have experience installing full wrap, one-piece lateral connections utilizing a compression O-ring gasket. The material and installation practices for sewer service lateral shall, at a minimum, adhere to the requirements of ASTM F2561-11 – Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main Using a One-Piece Main and Lateral Cured-in Place Liner; the liner assembly shall meet the ASTM F1216 and ASTM D5813 requirements.

The City also requires the contractor to have experience in installing the following products or approved equal: Insignia End Seals by LMK Enterprises, AV-202 multigrout, and In-liner Technologies, Insituform, or National liner. An equal product must be submitted for approval and must have a minimum of 500,000 linear feet or 2,000 manhole-to-manhole line sections of documented successful wastewater collection system installation in the U.S. and 250,000 linear feet of product shall have been in successful service within the State of Florida for a minimum of five (5) years.) Third-party test results with data supporting the long-term performance and structural strength of the approved product(s) proposed shall be reviewed by the City. Test samples shall be prepared to simulate installation methods and trauma of the product. No product will be approved without independent third-party testing verification.

Before awarding the contract, the City reserves the right to require that a firm submit such evidence of its qualifications as the City may deem necessary. Further, the City may consider any evidence of the financial, technical, and other qualifications and abilities of a firm or principal(s), including previous experiences of same with the City and performance evaluation for services, to make the award in the best interest of the City.

NOTE: REFERENCES SHALL NOT INCLUDE ONLY CITY OF FORT LAUDERDALE EMPLOYEES OR WORK PERFORMED FOR THE CITY. THE CITY IS ALSO INTERESTED IN WORK EXPERIENCE AND REFERENCES FROM ENTITIES OTHER THAN THE CITY OF FORT LAUDERDALE.

By signing this bid solicitation, contractor is affirming that this expertise will be provided for this Contract at no additional charge.

09. BID ALLOWANCE

Allowance for permits: Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The amount indicated is intended to be sufficient to cover the entire Project. If the City's permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of the City's permit fees required for project completion.

Allowance	Allowance Amount
Bypass Pumping Allowance	$ 45,000.00
Permit Fee Allowance	$ 12,000.00
Dewatering Allowance	$ 50,000.00
Landscape Allowance	$ 60,000.00
Owner's Contingency	$ 100,000.00
TOTAL:	**$ 267,000.00**

10. INSURANCE REQUIREMENTS *(See Article 10, Bonds and Insurance, of the Contract for details)*

INSURANCE

As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, Contractor, at its sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of

Contractor. Contractor shall provide the City a certificate of insurance evidencing such coverage. Contractor's insurance coverage shall be primary insurance for all applicable policies, in respect to the City's interests. The limits of coverage under each policy maintained by Contractor shall not be interpreted as limiting Contractor's liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

The coverages, limits, and/or endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by Contractor for assessing the extent or determining appropriate types and limits of coverage to protect Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under this Agreement.

The following insurance policies and coverages are required:

Commercial General Liability
Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for contractual liability and independent contractors.

The City, a Florida municipality, its officials, employees, and volunteers are to be covered as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Pollution and Remediation Legal Liability (Hazardous Materials)
For the purpose of this section, the term "hazardous materials" includes all materials and substances that are designated or defined as hazardous by Florida or federal law or by the rules or regulations of Florida or any federal agency. If work being performed involves hazardous materials, Contractor shall procure and maintain any or all of the following coverages (which will be specifically addressed upon review of exposure):

Contractors Pollution Liability Coverage
For sudden and gradual occurrences and in an amount not less than $1,000,000 per claim arising out of this Agreement, including but not limited to, all hazardous materials identified under the Agreement.
Business Automobile Liability
Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If Contractor does not own vehicles, Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Crane and Rigging Liability
Coverage must be afforded for any crane operations under the Commercial General or Business Automobile Liability policy as necessary, in line with the limits of the associated policy.

Workers' Compensation and Employer's Liability
Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

Contractor waives, and Contractor shall ensure that Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

Contractor must be in compliance with all applicable State and Federal workers' compensation laws, including the U.S. Longshore and Harbor Workers' Compensation Act and the Jones Act, if applicable.

Insurance Certificate Requirements

a. Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.
b. Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
d. In the event the Agreement term or any surviving obligation of Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
f. The City shall be covered as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
g. The City shall be granted a Waiver of Subrogation on Contractor's Workers' Compensation insurance policy.
h. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the application of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at Contractor's expense.

If Contractor's primary insurance policy/policies do not meet the minimum requirements as set forth in this Agreement, Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

Contractor's insurance coverage shall be primary insurance in respect to the City's interests, a Florida municipality, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City shall be non-contributory.

Any exclusion or provision in any insurance policy maintained by Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage may be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate of insurance should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement to Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is Contractor's responsibility to ensure that any and all of Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of Contractor. The City reserves the right to adjust insurance limits from time to time at its discretion with notice to Contractor.

NOTE: CITY PROJECT NUMBER, PROJECT NAME AND BID NUMBER MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON REQUIRED LIABILITY POLICIES.

A Sample Insurance Certificate shall be included with the bid to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.

11. PERFORMANCE AND PAYMENT BOND: 100%

12. CITY PROJECT MANAGER

The Project Manager is hereby designated by the City as Louis Lafaurie whose address is 100 North Andrews, 4th Floor, Fort Lauderdale, Florida 33301-1016, telephone number: (954) 828-6538, and e-mail address is llafaurie@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

13. LIQUIDATED DAMAGES *(See Article 16, Liquidated Damages, of the Contract for details)*

Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars ($500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. (See Article 16, Liquidated Damages Clause, of the Contract)

14. PAYMENT (*See Article 7, Payment, of the Contract for other details*)

Payment on this Contract will be made by check.

15. WORK SCHEDULE (including overtime hours):

Regular work hours: **8:00 am to 5:00 pm, Monday through Friday.**
City Inspector Hours: **8:00 am to 4:30 pm, Monday through Friday.**

Any inspection requested by the contractor outside those hours will be considered overtime to be paid by the Contractor.

16. INSPECTION OVERTIME COST: $100/hr.

CITY OF FORT LAUDERDALE
CONSTRUCTION AGREEMENT

THIS Agreement made and entered into this _____ day of _____, 2024, by and between the City of Fort Lauderdale, a Florida municipal corporation ("City") and _____, a Florida company/corporation ("Contractor"), ("Party" or collectively "Parties");

WHEREAS, the City desires to retain a contractor for the Project as expressed in its Invitation to Bid Event No. 226, Project Number P12464-B, which was opened on _____; and

WHEREAS, the Contractor has expressed its willingness and capability to perform the necessary work to accomplish the Project;

NOW, THEREFORE, the City and the Contractor, in consideration of the mutual covenants and conditions contained herein and for other good and valuable consideration, the receipt and sufficiency is hereby acknowledged, agree as follows:

ARTICLE 1 – DEFINITIONS

Whenever used in this Agreement or in other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural forms:

1.1 Agreement – This written Agreement between the City and the Contractor covering the work to be performed including other Contract Documents that are attached to or incorporated in the Agreement.

1.2 Application for Payment – The form accepted by the City which is to be used by the Contractor in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.

1.3 Approve – The word approve is defined to mean review of the material, equipment or methods for general compliance with design concepts and with the information given in the Contract Documents. It does not imply a responsibility on the part of the City to verify in every detail conformance with plans and specifications.

1.4 Bid – The offer or Bid of the Contractor submitted on the prescribed form setting forth the total prices for the Work to be performed.

1.5 Bid Documents – Advertisement for Invitation to Bids, the Instructions to Bidders, the Bid Form (with supplemental affidavits and sample agreements), the Contract Forms, General Conditions, the Supplementary Conditions, the Specifications, and the Plans, which documents all become an integral part of the Contract Documents.

1.6 Certificate of Substantial Completion - Certificate provided by the City certifying that all Work, excluding the punch list items, has been completed, inspected, and accepted by the City.

1.7 Change Order - A written document executed by both Parties ordering a change in the Contract Price or Contract Time or a material change in the Work.

1.8 City – The City of Fort Lauderdale, Florida, including but not limited to its employees, agents, officials, representatives, contractors, subcontractors, volunteers, successors and assigns, with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

1.9 Contract Documents – The Contract Documents shall consist of this Agreement, Exhibits to this Agreement, Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance, Notice of Award and Notice to Proceed, General Conditions, Special Conditions, Technical Specifications, Plans/Drawings, Addenda, Bid Form and supplement Affidavits and Agreements, all applicable provisions of State and Federal Law and any modification, including Change Orders or written amendments duly delivered after execution of Agreement, Invitation to Bid, Instructions to Bidders and Bid Bond, Contractor's response to the City's Invitation to Bid, Schedule of Completion, Schedule of Values, all amendments, modifications and supplements, work directive changes issued on or after the Effective Date of the Agreement, as well as any additional documents that are required to be submitted under the Agreement.

Permits on file with the City and/or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

1.10 Contract Price – The amount established in the bid submittal and award by the City's City Commission, as may be amended by Change Order.

1.11 Contract Time – The number of calendar days stated in the Agreement for the completion of the Work. The dates on which the work shall be started and shall be completed as stated in the Notice to Proceed.

1.12 Contractor – The person, firm, company, or corporation with whom the City has entered into the Agreement, including but not limited to its employees, agents, representatives, contractors, subcontractors, their subcontractors and their other successors and assigns.

1.13 Day – A calendar day of twenty-four (24) hours ending at midnight.

1.14 Defective – When modifying the word "Work" refers to work that is unsatisfactory, faulty, or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, test or approval referred to in the Contract Documents, or has been damaged prior to the Project Manager's recommendation of final payment.

1.15 Effective Date of the Agreement – The effective date of the Agreement shall be the date the City Commission approves the work.

1.16 Final Completion Date – The date the Work is completed, including completion of the final punch list, and delivered along with those items specified in the Contract Documents and is accepted by the City.

1.17 Hazardous Materials (HAZMAT) - Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in 40 CFR 300.6. Also defined by 49 CFR 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.

1.18 Hazardous Substance - As defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act; any substance designated pursuant to Section 311(b) (2) (A) of the Clean Water Act; any element, compound, mixture, solution or substance designated pursuant to Section 102 identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act {but not including any waste listed under Section 307[a] of the Clean Water Act}; any hazardous air pollutant listed under Section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture pursuant to Section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

1.19 Hazardous Waste - Those solid wastes designated by OSHA in accordance with 40 CFR 261 due to the properties of ignitability, corrosivity, reactivity, or toxicity. Any material that is subject to the Hazardous Waste Manifest requirements of the EPA specified in 40 CFR Part 262.

1.20 Holidays - Those designated non-workdays as established by the City Commission of the City of Fort Lauderdale.

1.21 Inspection – The term “inspection” and the act of inspecting as used in this Agreement is defined to mean the examination of construction to ensure that it conforms to the design concept expressed in the plans and specifications. This term shall not be construed to mean supervision, superintending and/or overseeing.

1.22 Notice of Award - The written notice by City to the Contractor stating that upon compliance by the Contractor with the condition’s precedent enumerated therein, within the time specified that the City will sign and deliver this Agreement.

1.23 Notice to Proceed – A written notice to Contractor authorizing the commencement of the activities identified in the notice or as described in the Contract Documents.

1.24 Plans - The official graphic representations of this Project that are a part of the Contract Documents.

1.25 Premises (otherwise known as Site or Work Site) – means the land, buildings, facilities, etc. upon which the Work is to be performed.

1.26 Project – The construction project described in the Contract Documents, including the Work described therein.

1.27 Project Manager - The employee of the City, or other designated individual who is herein referred to as the Project Manager, will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement. The Project Manager, or designee, shall be the authorized agent for the City unless otherwise specified.

1.28 Punch List - The City's list of Work yet to be done or be corrected by the Contractor, before the Final Completion date can be determined by the City.

1.29 Record Documents - A complete set of all specifications, drawings, addenda, modifications, shop drawings, submittals and samples annotated to show all changes made during the construction process.

1.30 Record Drawings or "As-Builts" - A set of drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the Contractor. These documents will be signed and sealed by a Professional Engineer, or a Professional Land Surveyor licensed in the State of Florida and employed by the Contractor at no cost to the City.

1.31 Substantially Completed Date – A date when written notice is provided by the City to the Contractor stating that the Work is substantially completed. If, at the time of inspection, it is determined the project is substantially completed, the City will also issue a letter of Substantial Completion along with a punch list of incomplete or deficient items to be completed prior to requesting a Final Completion inspection.

1.32 Work – The construction and services required by the Contract Documents, whether completed or partially completed, and includes all labor, materials, equipment, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute the whole or a part of the Project.

ARTICLE 2 – SCOPE OF WORK

2.1 The Contractor shall complete all Work as specified or indicated in the Contract Documents. The Project for which the Work under the Contract Documents may be the whole or only part is generally described as follows:

TARPON RIVER A-11 SEWER BASIN REHABILITATION
ITB EVENT# 226 PROJECT# P12464-B

2.2 All Work for the Project shall be constructed in accordance with the approved plans and Specifications. The Work generally involves:

PROJECT DESCRIPTION

This project is in the Neighborhood of Tarpon River within the following boundaries: S New River Dr in the north, SW Flagler Av in the west, SE 6th Av in the east, and SW 7th St in the south, in the City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, main lines lining, service laterals lining, new clean out installations (in asphalt, concrete, grass or rocks), clean out repairs, root removal, grease removal, double stack laterals lining, sectional liner installation, CCTV and repair recommendations, dye water testing, and incidental restoration repairs such as asphalt, grass, pavers, pavement markings, tree removals and minor landscaping.

2.3 Within ten (10) days of the execution of this Agreement, the Contractor shall submit a Construction Schedule, Schedule of Values and a listing of all personnel employed. The general sequence of the Work shall be submitted by the Contractor and approved by the City before any work commences. The City reserves the right to issue construction directives necessary to facilitate the Work or to minimize any conflict with operations.

ARTICLE 3 – PROJECT MANAGER

3.1 The Project Manager is hereby designated by the City as Louis Lafaurie, whose address is 100 N. Andrews Avenue, 4th Floor, Fort Lauderdale, FL 33301, telephone number: (954) 828-6538, and email address is llafaurie@fortlauderdale.gov. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

ARTICLE 4 – CONTRACT DOCUMENTS

The Contract Documents, which comprise the entire Agreement between the City and Contractor, are incorporated herein and attached to this Agreement, and consist of the following:

4.1 This Agreement.

4.2 Exhibits to this Agreement: (Plans sheets [ ] to [ ] inclusive).

4.3 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.

4.4 Notice of Award and Notice to Proceed.

4.5 General Conditions and Special Conditions.

4.6 Technical Specifications.

4.7 Plans/Drawings.

4.8 Addenda number _____ through _____, inclusive.

4.9 Bid Form and supplement Affidavits and Agreements.

4.10 All applicable provisions of State and Federal Law.

4.11 Invitation to Bid Event No. 226, Instructions to Bidders, and Bid Bond.

4.12 Contractor's response to the City's Invitation to Bid Event No. 226, dated _____.

4.13 Schedule of Completion.

4.14 All amendments, modifications and supplements, change orders and work directive changes, issued on or after the Effective Date of the Agreement.

4.15 Any additional documents that are required to be submitted under the Agreement.

4.16 Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement.

In the event of any conflict between the documents or any ambiguity or missing specification or instruction, the following priority is established:

a. Approved change orders, addenda or amendments.

b. Specifications and Drawings.

c. Special Conditions.

d. General Conditions.

e. This Agreement dated _____, and any attachments.

f. Invitation to Bid Event No. 226, and the specifications prepared by the City.

g. Contractor's response to the City's Invitation to Bid Event No. 226, dated _____.

h. Schedule of Values.

i. Schedule of Completion.

If during the performance of the Work, Contractor finds a conflict, error or discrepancy in the Contract Documents, Contractor shall so report to the Project Manager, in writing, within five (5) calendar days, and before proceeding with the Work affected shall obtain a written interpretation or clarification from the City.

Any Work that may reasonably be inferred from the specifications or plans as being required to produce the intended result shall be supplied whether or not it is specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such works shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization

or associations, or to the code of any governmental authority whether such reference be specific or implied, shall mean the latest standard specification, manual or code in effect as of the Effective Date of this Agreement, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the City, the Contractor, or any of their agents or employees from those set forth in the Contract Documents.

ARTICLE 5 – CONTRACT TIME

5.1 The Contractor recognizes that **TIME IS OF THE ESSENCE**. The Work shall commence within **fourteen** (14) calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **two hundred ten** (210) calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **two hundred forty** (240) calendar days after the Substantial Completion date.

ARTICLE 6 – CONTRACT PRICE

6.1 City shall pay Contractor for performance of the Work in accordance with Article 7, subject to additions and deletions by Change Order, as provided for in this Agreement.

6.2 The Parties expressly agree that the Contract Price, which shall not exceed the amount of $_____, constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line items unit prices listed in the Bid. Line items are based on a unit price cost multiplied by a defined quantity. Any additional duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change to the Contract Price.

6.3 The Contract Price constitutes the compensation payable to Contractor for performing the Work plus any Work done pursuant to a Change Order. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract Price.

ARTICLE 7 – PAYMENT

7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided for in the General Conditions.

7.2 Progress Payments. City shall make progress payments on account of the Contract Price on the basis of Contractor's monthly Applications for Payment, which shall be submitted by the Contractor between the first (1st) and the tenth (10th) day after the end

of each calendar month for which payment is requested. All progress payments will be made on the basis of the progress of the Work completed.

7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety-five percent (95%) of the value of Work completed less in each case the aggregate of payments previously made.

7.4 Final Payment. Upon final completion of the Work in accordance with the General Conditions, as may be supplemented, the City shall pay Contractor an amount sufficient to increase total payments to one hundred percent (100%) of the Contract Price. However, not less than five percent (5%) of the Contract Price shall be retained until Record Drawings (as-builts), specifications, addenda, modifications, and shop drawings, including all manufacturers' instructional and parts manuals are delivered to and accepted by the City.

7.5 City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:

7.5.1 Defective work not remedied.
7.5.2 Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
7.5.3 Failure of Contractor to make payments properly to subcontractors or for material or labor.
7.5.4 Damage to another contractor not remedied.
7.5.5 Liquidated damages and costs incurred by Consultant for extended construction administration, if applicable.
7.5.6 Failure of Contractor to provide any and all documents required by the Contract Documents.

When the above grounds are removed or resolved satisfactory to the Project Manager, payment shall be made in whole or in part.

7.6 The City shall make payment to the Contractor in accordance with the Florida Prompt Payment Act, Section 218.70, Florida Statutes (2022), as amended or revised, provided, however, complete and error free pay application is submitted.

7.7 The City shall make payment to the Contractor by check.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS

In order to induce the City to enter into this Agreement, Contractor makes the following representations upon which the City has relied:

8.1 Contractor is qualified in the field of public construction and in particular to perform the Work and services set forth in this Agreement.

8.2 Contractor has visited the Work Site, has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, water table

condition, moisture conditions and all year-round local weather and climate conditions (past and present), and examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Bid Price and that the project can be completed for the Bid Price submitted within the Contract Time as defined in this Agreement.

Furthermore, Contractor warrants and confirms that it is totally familiar with, understands and obligates Contractor to comply with all federal, state and local laws, ordinances, rules, regulations and all market conditions that affect or may affect the cost and price of materials and labor needed to fulfill all provisions of this Agreement or that in any manner may affect cost, progress or performance of the Work.

8.3 The Contractor has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Project, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

8.4 The Contractor has also studied on its own, investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Works, and finds and has further determined that no conditions exist that would in any manner affect the Bid Price and that the Project can be completed for the Bid Price submitted.

8.5 Contractor has made or caused to be made, examinations, investigations, tests and studies of such reports and related data in addition to those referred to in Paragraphs 8.2, 8.3 and 8.4 above as it deems necessary for the performance of the Work at the Contract Prices, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor for such purposes.

8.6 Contractor has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.

8.7 Contractor has given City written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution by City is acceptable to the Contractor.

8.8 <u>Labor</u>

8.8.1 The Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site.

8.8.2 The Contractor shall, at all times, have a competent superintendent, capable of reading and thoroughly understanding the drawings and specifications, as the

Contractor's agent on the Work, who shall, as the Contractor's agent, supervise, direct and otherwise conduct the Work.

8.8.3 The Contractor shall designate the superintendent on the job to the City, in writing, immediately after receipt of the Notice to Proceed. The Contractor understands and agrees that the superintendent's physical presence on the job site is indispensable to the successful completion of the Work. If the superintendent is frequently absent from the job site, the Project Manager may deliver written notice to the Contractor to stop work or terminate the Agreement in accordance with Article 17.

8.8.4 Where required and necessary, the Contractor shall, at all times, have a certified "competent person" assigned to the job site. The Contractor shall assign personnel to the job site that have successfully completed training programs related to trench safety, confined space work, and maintenance of traffic (MOT). Personnel certified by the International Municipal Signal Associations with Florida Department of Transportation qualifications are required relative to MOT. Any other certifications that may be required by applicable permitting agencies for the Work shall also be complied with by the Contractor. Failure to pursue the Work with the properly certified supervisory staff may result in notice to stop work or terminate the Agreement in accordance with Article 17.

8.9 Materials:

8.9.1 The Contractor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of Work.

8.9.2 All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. Suppliers shall be selected and paid by the Contractor; the City reserves the right to approve all suppliers and materials.

8.10 Work Hours: Except in connection with the safety or protection of persons, or the Work, or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all work at the site shall be performed during regular working hours between 8 a.m. and 5:00 p.m., Monday through Friday.

Unless approved by the City in advance, the Contractor will not perform work on Saturday, Sunday or any legal holiday (designated by the City of Fort Lauderdale) without the Project Manager's written consent at least seventy-two (72) hours in advance of starting such work. For any overtime inspection required by City personnel, the Contractor shall pay for the additional charges to the City with respect to such overtime work. Such additional charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made to the Contractor for overtime work. **It shall be noted that the City's Inspector work hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday, and any work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime at a rate of $100.00 per hour.** The cost to the Contractor to reimburse the City for overtime inspection is established at direct-labor and overtime costs for each person or

inspector required. Incidental overtime costs for engineering, testing and other related services will also be charged to the Contractor at the actual rate accrued.

8.11 Patent Fee and Royalties: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work, or any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor hereby expressly binds itself to indemnify and hold harmless the City from all such claims and fees and from any and all suits and action of every name and description that may be brought against City on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may be brought against said City for the infringement of any and all patents or patent rights claimed by any person, firm corporation or other entity.

8.12 Permits: The Contractor shall obtain and pay for all permits and licenses. There shall be no allowance for Contractor markup, overhead or profit for permits and licenses.

The Contractor shall pay all government charges which are applicable at the time of opening of bids. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.

8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the specifications or plans are in conflict, the Contractor shall give the Project Manager prompt written notice thereof within five (5) calendar days, and any necessary changes shall be adjusted by any appropriate modifications. If the Contractor performs any work knowing or having reason to know that it is contrary to such laws, ordinances, rules, standards, specifications and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom.

8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, and the State of Florida.

8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

The Contractor shall not enter upon private property for any purpose without first securing the permission of the property owner in writing and furnishing the Project Manager with a copy of said permission. This requirement will be strictly enforced, particularly with regard to such vacant properties as may be utilized for storage or staging by the Contractor.

The Contractor shall conduct its work in such a manner as to avoid damage to adjacent private or public property. Any damage to existing structures of work of any kind, including permanent reference markers or property corner markers, or the interruption

of a utility service, shall be repaired or restored promptly at no expense to the City or property owner.

The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction, as determined by the Project Manager. The Contractor will be responsible for repairing or replacing any trees, shrubs, lawns and landscaping that may be damaged due to careless operation of equipment, stockpiling of materials, tracking of grass by equipment or other construction activity. The Contractor will be liable for or will be required to replace or restore at no expense to the City all properties and areas not protected or preserved as required herein that may be destroyed or damaged.

During the progress of the Work, the Contractor shall keep the premises free from accumulation of waste materials, rubbish and debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by the City. The Contractor shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents at no cost to the City.

8.16 Project Coordination: The Contractor shall provide for the complete coordination of the construction effort. This shall include, but not necessarily be limited to, coordination of the following:

8.16.1 Flow of material and equipment from suppliers.
8.16.2 The interrelated work with affected utility companies.
8.16.3 The interrelated work with the City where tie-ins to existing facilities are required.
8.16.4 The effort of independent testing agencies.
8.16.5 Notice to affected property owners as may be directed by the Project Manager.
8.16.6 Coordination with and scheduling of all required inspections from all permitting agencies.

8.17 Project Record Documents and Final As-Builts (Record Drawings): Contractor shall be responsible for maintaining up-to-date redline as-built drawings, on site, at all times during construction. All as-built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. Contractor shall provide the City with a minimum of three (3) sets of signed and sealed record drawings (Final As-Builts) and a CD of the electronic drawings files created in AutoCad 2014 or later. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the Contractor.

8.18 Safety and Protection:

8.18.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

8.18.1.1 All employees working on the project and other persons who may be affected thereby.

8.18.1.2 All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

8.18.1.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

8.18.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and utilities when execution of the Work may affect them at least seventy-two (72) hours in advance (unless otherwise required). All damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties

and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and accepted by the City.

8.19 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

8.20 Risk of Loss: The risk of loss, injury or destruction shall be on the Contractor until acceptance of the Work by the City. Title to the Work shall pass to the City upon acceptance of the Work by the City.

8.21 Environmental: The Contractor has fully inspected the Premises and agrees, except as to the presence of any asbestos, to accept the Premises in an "as is" physical condition, without representation or warranty by the City of any kind, including, without limitation, any and all existing environmental claims or obligations that may arise from the presence of any "contamination" on, in or about the Premises. Further, Contractor and all entitles claiming by, through or under the Contractor, releases and discharges the City from any claim, demand, or cause of action arising out of or relating to the Contractor's use, handling, storage, release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of any hazardous substances including asbestos on, under, from or about the Premises. The Contractor shall have no liability for any pre-existing claims or "contamination" on the Premises.

The Contractor shall not use, handle, store, discharge, treat, remove, transport, or dispose of Hazardous Substances including asbestos at, in, upon, under, to or from the Premises

until receipt of instructions from the City. At such time, a City approved Change Order, which shall not include any profit, shall authorize the Contractor to perform such services.

The Contractor shall immediately deliver to the Project Manager complete copies of all notices, demands, or other communications received by the Contractor from any governmental or quasi-governmental authority or any insurance company or board of fire underwriters or like or similar entities regarding in any way alleged violations or potential violations of any Environmental Law or otherwise asserting the existence or potential existence of any condition or activity on the Premises which is or could be dangerous to life, limb, property, or the environment.

For other and additional consideration, the Contractor hereby agrees, at its sole cost and expense, to indemnify and protect, defend, and hold harmless the City and its respective employees, agents, officials, officers, representatives, contractors and subcontractors, successors, and assigns (hereafter the "City") from and against any and all claims, demands, losses, damages, costs, expenses, including but not limited to mitigation, restoration, and natural restoration expenses, liabilities, assessments, fines, penalties charges, administrative and judicial proceedings and orders, judgments, causes of action, in law or in equity, remedial action requirements and/or enforcement actions of any kind (including, without limitation, attorneys' fees and costs) directly or indirectly arising out of or attributable to, in whole or in part, the Contractor's use, handling, storage, release, threatened release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of a Hazardous Substance (excluding asbestos) on, under, from, to or about the Premises or any other activity carried on or undertaken on or off the Premises by the Contractor or its employees, agents or subcontractors, in connection with the use, handling, storage, release, threatened release, discharge, treatment, mitigation, natural resource restoration, removal, transport, decontamination, cleanup, disposal and/or presence or any Hazardous Substance including asbestos located, transported, or present on, undue, from, to, or about the Premises. This indemnity is intended to be operable under 42 U.S.C. Section 9607, as amended or revised, and any successor section.

The scope of the indemnity obligations includes, but is not limited to: (a) all consequential damages; (b) the cost of any required or necessary repair, cleanup, or detoxification of the applicable real estate and the preparation and implementation of any closure, remedial or other required plan, including without limitation; (i) the costs of removal or remedial action incurred by the United States government or the State of Florida or response costs incurred by any other person, or damages from injury to destruction of, or loss of, natural resources, including the cost of assessing such injury, destruction, or loss, incurred pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, as amended; (ii) the clean-up costs, fines, damages, or penalties incurred pursuant to any applicable provisions of Florida law; and (iii) the cost and expenses of abatement, correction or cleanup, fines, damages, response costs, or penalties which arise from the provisions of any other statute, law, regulation, code ordinance, or legal requirement state or federal; and (c) liability for personal injury or property damage arising under any statutory or common law tort theory, including damages assessed for the maintenance of a public private nuisance, response costs, or for the carrying on of an abnormally dangerous activity.

8.22 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any other reason or allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

8.23 No Liens: If any subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the Work is performed or any part or against any personal property or improvements or claim against any monies due or to become due from the City to Contractor or from Contractor to a subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any Change Order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within twenty (20) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining such. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments.

8.24 Weather Emergencies: Upon issuance of a hurricane watch by the National Weather Service, the Contractor shall submit to the City a plan to secure the work area in the event a hurricane warning is issued. The plan shall detail how the Contractor will secure the Premises, equipment and materials in a manner as to prevent damage to the Work and prevent materials and equipment from becoming a hazard to persons and property on and around the Premises. The plan shall include a time schedule required to accomplish the hurricane preparations and a list of emergency contacts that will be available, and in the City before, during and immediately after the storm.

Upon issuance of a hurricane warning by the National Weather Service, if the Contractor has not already done so, the Contractor shall implement its hurricane preparedness plan. Cost of development and implementation of the hurricane preparedness plan shall be considered as incidental to construction. Cost of any clean up and rework required after the storm will be considered normal construction risk within Florida and shall not

entitle the Contractor to any additional compensation. Contractor shall be entitled to request an extension in time for completion of the Work, in accordance with the provisions of Article 15 of this Agreement, equal to the time it is shut down for implementation of the preparedness plan, the duration of the storm and a reasonable period to restore the Premises.

8.25 Force Majeure: No Party shall hold the other responsible for damages or for delays in performance caused by force majeure, acts of God, or other acts or circumstances beyond the control of the other Party or that could not have been reasonably foreseen and prevented. For this purpose, such acts or circumstances shall include, but not be limited to weather conditions affecting performance, floods, epidemics, pandemics, war, act of Governmental Authority, state of emergency, riots, strikes, lockouts, or other industrial disturbances, or protest demonstrations. Should such acts or circumstances occur, the Parties shall use their best efforts to overcome the difficulties arising therefrom and to resume the Work as soon as reasonably possible with the normal pursuit of the Work.

Inclement weather, continuous rain for less than three (3) days or the acts or omissions of subcontractors, third-party contractors, materialmen, suppliers, or their sub-contractors, shall not be considered acts of force majeure.

No Party shall be liable for its failure to carry out its obligations under the Agreement during a period when such Party is rendered unable by force majeure to carry out its obligation, but the obligation of the Party or Parties relying on such force majeure shall be suspended only during the continuance of the inability and for no longer period than the unexpected or uncontrollable event.

The Contractor further agrees and stipulates, that its right to excuse its failure to perform by reason of force majeure shall be conditioned upon giving written notice of its assertion that a Force Majeure delay has commenced within ninety-six (96) hours after such an occurrence. The Contractor shall use its reasonable efforts to minimize such delays. The Contractor shall promptly provide an estimate of the anticipated additional time required to complete the Project.

8.26 Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assisted Contracts: The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR Part 26 and as approved by DOT, is incorporated by reference in this Agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this Agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 *et seq.*).

Additionally, the Contractor assures that it, the sub-recipient or its subcontractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of

this Agreement. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as the recipient deems appropriate. This additional language must be included in each subcontract the prime Contractor signs with a subcontractor.

ARTICLE 9 – CITY'S RESPONSIBILITIES

9.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Article 7.

9.2 The City shall provide public rights-of-way and easement, where available, for the installation of conduits, transformers pads and related appurtenances only.

9.3 Technical Clarifications and Interpretations:

9.3.1 The City shall issue, with reasonable promptness, such written clarifications or interpretations of the Contract Documents as it may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Should the Contractor fail to request interpretation of questionable items in the Contract Documents, the City shall not entertain any excuse for failure to execute the Work in a satisfactory manner.

9.3.2 The City shall interpret and decide matters concerning performance under the requirements of the Contract Documents, and shall make decisions on all claims, disputes or other matters in question. Written notice of each claim, dispute or other matter will be delivered by claimant to the other Party but in no event later than five (5) days after the occurrence of event and written supporting data will be submitted to the other Party within five (5) days after such occurrence. All written decisions of the City on any claim or dispute will be final and binding.

9.4 The Contractor shall perform all Work to the reasonable satisfaction of the City in accordance with the Contract Documents. In cases of disagreement or ambiguity, the City shall decide all questions, difficulties, and disputes of whatever nature, which may arise under or by reason of this Agreement or the quality, amount and value of the Work, and the City's decisions on all claims, questions and determination are final.

9.5 Cancellation for Unappropriated Funds**:** The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the Agreement into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

ARTICLE 10 – BONDS AND INSURANCE

10.1 Public Construction and Other Bonds: The Contractor shall furnish Public Construction or Performance and Payment Bonds ("Bond"), each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. These Bonds shall remain in

effect until at least one (1) year after the date of final payment, except as otherwise provided by law. All Bonds shall be furnished and provided by the surety and shall be in substantially the same form as prescribed by the Contract Documents and be executed by such sureties as (i) are licensed to conduct business in the State of Florida, and (ii) are named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department and (iii) otherwise meet the requirements set forth herein that apply to sureties. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

10.1.1 Performance Bond: The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2022), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

A Corporate Surety Bond legally issued, meeting the approval of, and running to the City in an amount not less than the Contract Price of such improvements, conditioned that the Contractor shall maintain and make all repairs to the improvements constructed by the Contractor at their own expense and free of charge to the City, for the period of one (1) year after the date of acceptance of the Work within such period by reason of any imperfection of the material used or by reason of any defective workmanship, or any improper, imperfect or defective preparation of the base upon which any such improvement shall be laid.

10.2 Disqualification of Surety: If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State of Florida or it ceases to meet the requirements of clauses (i) and (ii) of Paragraph 10.1, the Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to the City.

10.3 Insurance

As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, Contractor, at its sole expense, shall provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of Contractor. Contractor shall provide the City a certificate of insurance evidencing such coverage. Contractor's insurance coverage shall be primary insurance for all applicable policies, in respect to the City's interests. The limits of coverage under each policy maintained by Contractor shall not be interpreted as limiting Contractor's liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

The coverages, limits, and/or endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by Contractor for assessing the extent or determining appropriate types and limits of coverage to protect Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under this Agreement.

The following insurance policies and coverages are required:

Commercial General Liability
Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $1,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $1,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for contractual liability and independent contractors.

The City, a Florida municipality, its officials, employees, and volunteers are to be covered as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Pollution and Remediation Legal Liability (Hazardous Materials)
For the purpose of this section, the term "hazardous materials" includes all materials and substances that are designated or defined as hazardous by Florida or federal law or by the rules or regulations of Florida or any federal agency. If work being performed involves hazardous materials, Contractor shall procure and maintain any or all of the following coverages (which will be specifically addressed upon review of exposure):

Contractors Pollution Liability Coverage
For sudden and gradual occurrences and in an amount not less than $1,000,000 per claim arising out of this Agreement, including but not limited to, all hazardous materials identified under the Agreement.
Business Automobile Liability
Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If Contractor does not own vehicles, Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Crane and Rigging Liability

Coverage must be afforded for any crane operations under the Commercial General or Business Automobile Liability policy as necessary, in line with the limits of the associated policy.

Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute.

Contractor waives, and Contractor shall ensure that Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

Contractor must be in compliance with all applicable State and Federal workers' compensation laws, including the U.S. Longshore and Harbor Workers' Compensation Act and the Jones Act, if applicable.

Insurance Certificate Requirements

a. Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.
b. Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
d. In the event the Agreement term or any surviving obligation of Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.
e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.
f. The City shall be covered as an Additional Insured on all liability policies, with the exception of Workers' Compensation.
g. The City shall be granted a Waiver of Subrogation on Contractor's Workers' Compensation insurance policy.
h. The title of the Agreement, Bid/Contract number, event dates, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale
100 N. Andrews Avenue
Fort Lauderdale, FL 33301

Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the application of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for adding the City as an Additional Insured shall be at Contractor's expense.

If Contractor's primary insurance policy/policies do not meet the minimum requirements as set forth in this Agreement, Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

Contractor's insurance coverage shall be primary insurance in respect to the City's interests, a Florida municipality, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City shall be non-contributory.

Any exclusion or provision in any insurance policy maintained by Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the contract work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage may be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate of insurance should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement to Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is Contractor's responsibility to ensure that any and all of Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of Contractor. The City reserves the right to adjust insurance limits from time to time at its discretion with notice to Contractor.

NOTE: CITY PROJECT NUMBER, PROJECT NAME AND BID NUMBER MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON REQUIRED LIABILITY POLICIES.

A Sample Insurance Certificate shall be included with the bid to demonstrate the firm's ability to comply with insurance

requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.

ARTICLE 11- WARRANTY AND GUARANTEE, TESTS AND INSPECTIONS, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

11.1 Warranty: The Contractor warrants and guarantees to the City that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.

11.1.1 Warranty of Title: The Contractor warrants to the City that it possesses good, clear and marketable title to all equipment and materials provided and that there are no pending liens, claims or encumbrances against the equipment and materials.

11.1.2 Warranty of Specifications: The Contractor warrants that all equipment, materials and workmanship furnished, whether furnished by the Contractor, its subcontractors or suppliers, will comply with the specifications, drawings and other descriptions supplied or adopted and that all services will be performed in a workmanlike manner.

11.1.3 Warranty of Merchantability: The Contractor warrants that any and all equipment to be supplied pursuant to this Agreement is merchantable, free from defects, whether patent or latent in material or workmanship, and fit for the ordinary purposes for which it is intended.

11.2 Tests and Inspections: Contractor shall retain the services of an independent, certified, testing lab to perform all testing as required by the specifications, contract drawings, and any applicable permitting agency. Contractor shall provide evidence of certification to the City before the work and testing is done. Testing results shall be submitted to the Project Manager for review and approval at the time the results are provided to the Contractor. The Contractor shall give the Project Manager and City Inspector a minimum of twenty-four (24) hours' advanced notice of readiness of the Work for all required inspections, tests, or approvals and shall notify all applicable permitting agencies in a timely manner based on requirements set forth in the permit documents.

11.2.1 Neither observations by the Project Manager nor inspections, tests or approvals by others shall relieve the Contractor from its obligations to perform the Work in accordance with the Contract Documents.

11.3 Uncovering Work: If any work that is to be inspected, tested or approved is covered without approval or consent of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation and/or testing. Such uncovering and replacement shall be at the Contractor's sole expense unless the Contractor has given the Project Manager timely notice of the Contractor's intention to cover such Work and the Project Manager has not acted with reasonable promptness in response to such notice.

11.3.1 If the Project Manager considers it necessary or advisable that Work covered in accordance with Paragraphs 11.2.1 be observed by the City or inspected or tested by others, the Contractor at the City's request, shall uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection testing and reconstruction if it makes a claim therefore as provided in Articles 14 and 15.

11.4 City May Stop the Work: If the Work is defective, or the Contractor fails to supply sufficient skilled supervisory personnel or workmen or suitable materials or equipment or the work area is deemed unsafe, the City may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor or any other Party. The City will not award any increase in Contract Price or Contract Time if the Work is stopped due to the circumstances described herein.

11.5 Correction or Removal of Defective Work Before Final Payment: If required by the Project Manager, the Contractor shall promptly, without cost to the City and as specified by the Project Manager, either correct any defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by the City remove it from the site and replace it with non-defective Work.

11.6 One Year Correction Period After Final Payment: If within one (1) year after the date of final acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, either correct such defective Work, or, if it has been rejected by the City, remove it from the site and replace it with non-defective Work.

If the Contractor does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs for such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor.

11.7 Acceptance of Defective Work, Deductions: If, instead of requiring correction or removal and replacement of defective Work, the City, at the City's sole option, prefers to accept it, the City may do so. In such a case, if acceptance occurs prior to the Project Manager's recommendation of final payments, a Change Order shall be issued incorporating the necessary revisions in the Contract's Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the Contractor to the City.

11.8 City May Correct Defective Work: If the Contractor fails within a reasonable time after written notice of the Project Manager to proceed to correct defective Work or to remove and replace rejected Work as required by the Project Manager in accordance with Paragraph 11.5, or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may, after seven (7) days' written notice to the Contractor, correct and remedy any such deficiency. In exercising its rights under this paragraph, the City shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the City may exclude the Contractor from all or part of the site, take possession of all or part of the Work, suspend the Contractor's services related thereto and take possession of the Contractor's tools, construction equipment and materials stored at the site or elsewhere. The Contractor shall allow the City's representative agents and employees such access to the site as may be necessary to enable the City to exercise its rights under this paragraph. All direct and indirect costs of the City in exercising such rights shall be charged against the Contractor in an amount verified by the Project Manager, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's right hereunder.

ARTICLE 12 – INDEMNIFICATION

12.1 Disclaimer of Liability: The City shall not at any time, be liable for injury or damage occurring to any person or property from any cause, whatsoever, arising out of Contractor's construction and fulfillment of this Agreement.

12.2 Indemnification: For other, additional good valuable consideration, the receipt and sufficiency of which is hereby acknowledged:

12.2.1 Contractor shall, at its sole cost and expense, indemnify and hold harmless the City, its representatives, employees and elected and appointed officials from or on account of all claims, damages, losses, liabilities and expenses, direct, indirect or consequential including but not limited to fees and charges of engineers, architects, attorneys, consultants and other professionals and court costs arising out of or in consequence of the performance of this Agreement at all trial and appellate levels. Indemnification shall specifically include but not be limited to claims, damages, losses, liabilities and expenses arising out of or from (a) the negligent or defective design of the project and Work of this Agreement; (b) any act, omission or default of the Contractor, its subcontractors, agents, suppliers, employees or laborers; (c) any and all bodily injuries, sickness, disease or death; (d) injury to or destruction of tangible property, including any resulting loss of use; (e) other such damages, liabilities, or losses received or sustained by any person or persons during or on account of any operations connected with the construction of this Project including the warranty period; (f) the use of any improper materials; (g) any construction defect including both patent and latent

defects; (h) failure to timely complete the work; (i) the violation of any federal, state, county or City laws, ordinances or regulations by Contractor, its subcontractors, agents, servants, independent contractors or employees; (j) the breach or alleged breach by Contractor of any term of the Agreement, including the breach or alleged breach of any warranty or guarantee.

12.2.2 Contractor agrees to indemnify, defend, and hold harmless the City, its officers, agents and employees, from all damages, liabilities, losses, claims, fines and fees, and from any and all suits and actions of every name and description that may be brought against City, its officers, agents and employees, on account of any claims, fees, royalties, or costs for any invention or patent and/or for the infringement of any and all copyrights or patent rights claimed by any person, firm, or corporation.

12.2.3 Contractor shall pay all claims, losses, liens, settlements or judgments of any nature in connection with the foregoing indemnifications including, but not limited to, reasonable attorney's fees and costs for trials and appeals.

12.2.4 If any subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements thereon or make a claim against any monies due or to become due from the City to Contractor or from Contractor to a subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any change order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within five (5) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining the discharge. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments, and which shall be deducted from any amount owing to Contractor. In the event the amount due Contractor is less than the amount required to satisfy Contractor's obligation under this, or any other article, paragraph or section of this Agreement, the Contractor shall be liable for the deficiency due the City.

12.2.5 The Contractor and the City agree that Section 725.06(2), Florida Statutes (2022), as may be amended or revised, controls the extent and limits of the indemnification and hold harmless provisions of this Agreement, if any, and that the Parties waive any defects in the wording of this Article that runs afoul of said statutory section.

ARTICLE 13 – CHANGES IN THE WORK

13.1 Without invalidating this Agreement, the City may, at any time or from time-to-time order additions, deletions or revisions in the Work through the issuance of Change Orders. Upon receipt of a fully executed Change Order, the Contractor shall proceed with the Work involved. All Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 14 or Article 15 on the basis of a claim made by either Party.

13.2 The Project Manager may authorize minor changes in the Work not involving an adjustment in the Contract Price or the Contract Time, which are consistent with the overall intent of the Contract Documents. Such changes must be in writing and signed by the City and the Contractor.

13.3 If notice of any change affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be the Contractor's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City.

ARTICLE 14 – CHANGE OF CONTRACT PRICE

Change of Contract Price, approved by City, shall be computed as follows:

14.1 Cost of the Work: The term "Cost of the Work" means the sum of all direct costs necessarily incurred and paid by Contractor in the proper performance of the Work. Except as otherwise may be agreed to in writing by the City, these costs shall be in amounts no higher than those prevailing in the City and shall include only the following items and shall not include any of the costs itemized in Paragraph 14.3:

14.1.1 Payroll costs for employees in the direct employ of the Contractor in the performance of the Work under schedules of job classifications agreed upon by the City and the Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work.

Payroll costs shall include, but not be limited to, salaries and wages plus cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, worker's compensation, health and retirement benefits, bonuses, sick leave, vacation and applicable holiday pay.

14.1.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage, and required suppliers and field services. All cash discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the City, and the Contractor shall make provisions so that they may be obtained.

14.1.3 Supplemental costs including the following:

14.1.3.1 Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work.

14.1.3.2 Rentals of all construction equipment and machinery and the parts whether rented from the Contractor or others in accordance with rental agreements approved by the City, and the costs of transporting, loading, unloading, installation, dismantling and removal. The rental of any such equipment, machinery or parts shall cease when the use is no longer necessary for the Work.

14.1.3.3 Sales, consumer, use or similar taxes related to the Work and for which the Contractor is liable, imposed by laws and regulations.

14.1.3.4 Royalty payments and fees for permits and licenses.

14.1.3.5 The cost of utilities, fuel and sanitary facilities at the Work site.

14.1.3.6 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

14.1.3.7 Cost of premiums for additional bonds and insurance required because of changes in the Work.

14.2 The Contract Price may only be increased by an approved and fully executed Change Order when Work is modified in accordance with Article 13 and approved by the City in writing. Any claim for an increase in the Contract Price resulting from a Change Order shall be based on written notice delivered to the Project Manager within ten (10) days of the occurrence of the Change Order giving rise to the claim. Notice of the amount of the claim with supporting data shall be included in the Change Order and delivered within twenty (20) days of such occurrence unless Project Manager allows an additional period of time to ascertain accurate cost data. Any change in the Contract Price resulting from any such claim shall be incorporated in the Change Order. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

14.3 Not Included in the Cost of the Work: The term “Cost of the Work” shall not include any of the following:

14.3.1 Payroll costs and other compensation of the Contractor’s officers’ executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditor, accountants, purchasing and contracting agents, expediters, timekeepers, clerks and other personnel employed by the Contractor whether at the site or in the Contractor’s principal or branch office for general administration of the work and not specifically

included in the agreed upon schedule of job classifications referred to in Paragraph 14.1.1, all of which are to be considered administrative costs covered by the Contractor's fee.

14.3.2 Expenses of the Contractor's principal and branch offices other than the Contractor's office at the site.

14.3.3 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments.

14.3.4 Cost of premiums for all bonds and for all insurance whether or not the Contractor is required by the Contract Documents to purchase and maintain the same.

14.3.5 Costs due to the negligence of the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

14.3.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 14.1.

14.4 Basis of Compensation: The Contractor's compensation, allowed to the Contractor for overhead and profit, shall be determined as follows:

14.4.1 A mutually acceptable negotiated fee:

14.4.1.1 For costs incurred under Paragraphs 14.1.1 and 14.1.2, the Contractor's fee shall not exceed five percent (5%).

14.4.1.2 No fee shall be payable on the basis of costs itemized under Paragraphs 14.1.3.1, 14.1.3.2, 14.1.3.3, 14.1.3.4, 14.1.3.5, 14.1.3.6, 14.1.3.7, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 14.3.5 and 14.3.6.

14.4.1.3 The amount of credit to be allowed by the Contractor to the City for any such change which results in a net decrease plus a deduction in the Contractor's fee by an amount equal to five percent (5%) for the net decrease.

14.4.1.4 When both additions and credits are involved in any one change the combined overhead and profit shall be figured on the basis of net increase if any, however, not to exceed five percent (5%) of the agreed compensation. Profit will not be paid on any Work not performed.

14.5 Cost Breakdown Required: Whenever the cost of any Work is to be determined pursuant to this Article, the Contractor will submit in form acceptable to the City an itemized cost breakdown together with supporting documentation. Whenever a change in the Work is to be based upon mutual acceptance of a lump sum, whether the amount is an

addition, credit, or no-charge-in-cost, the Contractor shall submit an estimate substantiated by a complete itemized breakdown:

14.5.1 The breakdown shall list quantities and unit prices for materials, labor, equipment and other items of cost.

14.5.2 Whenever a change involves the Contractor and one (1) or more subcontractors and the change is an increase in the agreed compensation, the overhead and profit percentage for the Contractor and each subcontractor shall be itemized separately.

ARTICLE 15 – CHANGE OF THE CONTRACT TIME

15.1 The Contract Time may only be changed by an approved and fully executed Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Manager within five (5) days of the occurrence of the event giving rise to the claim. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

15.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made therefore as provided in Paragraph 15.1. Such delays shall include but not be limited to, acts or neglect by the City, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, pandemics, act of Governmental Authority, state of emergency, or acts of God.

15.3 All time limits stated in the Contract Documents are of the essence. The provisions of this Article 15 shall not exclude recovery for damages for delay by the Contractor.

15.4 Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor (non-affiliated Contractors) shall not give rise to a claim by the Contractor for damages for increases in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T and Florida East Coast Railway, LLC.

15.5 Rights of Various Interests: Whenever work being done by City's forces or by other contractors is contiguous to or within the limits of work covered by this Agreement, the respective rights of the various interests involved shall be established by the Project Manager to secure the completion of the various portions of the Work in general harmony.

ARTICLE 16 – LIQUIDATED DAMAGES

16.1 Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of _____ **Hundred/Thousand Dollars ($_.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay Is caused by the Contractor. Should an act of God or the acts or omissions of the City, its agents or representatives, in derogation to the terms of this Agreement cause the delay, the Contractor shall not be responsible for the delay nor liquidated

damages. Liquidated damages are fixed and agreed upon between the Parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by the City as a consequence of such delay and both Parties desiring to obviate any question of dispute concerning the amount of damages and the cost and effect of the failure of the Contractor to complete the Work on time. Liquidated damages shall apply separately to each portion of the Work for which a time of completion is given. The City shall have the right to deduct from or retain any compensation which may be due or which may become due and payable to the Contractor the amount of liquidated damages, and if the amount retained by the City is insufficient to pay in full such liquidated damages, the Contractor shall pay all liquidated damages in full. The Contractor shall be responsible for reimbursing the City, in addition to liquidated damages or other damages for delay, for all costs of engineering, architectural fees, and inspection and other costs incurred in administering the construction of the Project beyond the completion date specified or beyond an approved extension of time granted to the Contractor whichever is later. Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor shall not give rise to a claim by Contractor for damages for increase in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T, and Florida East Coast Railway, LLC.

16.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

ARTICLE 17 – SUSPENSION OF WORK AND TERMINATION

17.1 City May Suspend Work: The City may, at any time and without cause, suspend the Work or any portion of the Work for a period of not more than ninety (90) days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor shall resume the Work on the date fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension, if the Contractor makes a claim as provided in Articles 14 and 15.

17.2 City's Right to Terminate Contract: The City may terminate this Agreement upon fifteen (15) calendar days' written notice upon the occurrence of any one or more of the following events:

17.2.1 If the Contractor makes a general assignment for the benefit of creditors.

17.2.2 If a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under Agreement, whose appointment or authority to take charge of property of the Contractor is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of the Contractor's creditors.

17.2.3 If Contractor fails to begin the Work within fifteen (15) calendar days after the date set forth in the Notice to Proceed, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to ensure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if Contractor shall fail to perform any material term set forth in the Contract Documents, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Project Manager may give notice in writing to Contractor and its Surety of such delay, neglect or default, specifying the same.

17.2.4 If the Contractor repeatedly fails to make prompt payments to subcontractors or for labor, material or equipment.

17.2.5 If the Contractor repeatedly disregards proper safety procedures.

17.2.6 If the Contractor disregards any local, state or federal laws or regulations.

17.2.7 If the Contactor otherwise violates any provisions of this Agreement.

17.3 If Contractor, within a period of ten (10) calendar days after such notice, shall not proceed in accordance therewith, the City may exclude the Contractor from the Work site and take the prosecution of the Work out of the hands of the Contractor, and take possession of the Work and all of the Contractor's tools, appliances, construction equipment and machinery at the site and use them without liability to the City for trespass or conversion, incorporate in the Work all materials and equipment stored at the site or for which the City has paid the Contractor but which are stored elsewhere, and finish the Work as the City may deem expedient. In this instance, the Contractor shall not be entitled to receive any further compensation until the Work is finished.

17.3.1 If after notice of termination of Contractor's notice to proceed, it is determined for any reason that Contractor was not in default, the rights and obligations of City and Contractor shall be the same as if the notice of termination had been issued pursuant to the Termination for Convenience clause as set forth below in Section 17.5.

17.3.2 Upon receipt of Notice of Termination pursuant to Sections 17.2 or 17.5, Contractor shall promptly discontinue all affected work unless the Notice of Termination directs otherwise and deliver or otherwise make available to City all data, drawings, specifications, reports, estimates, summaries and such other information as may have been required by the Contract Documents whether completed or in process.

17.4 If the Contractor commits a default due to its insolvency or bankruptcy, the following shall apply:

17.4.1 Should this Agreement be entered into and fully executed by the Parties, funds released and the Contractor (Debtor) files for bankruptcy, the following shall occur:

17.4.1.1 In the event the Contactor files a voluntary petition under 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303, the Contractor shall acknowledge the extent, validity, and priority of the lien recorded in favor of the City. The Contractor further agrees that in the event of this default, the City shall, at its option, be entitled to seek relief from the automatic stay pursuant to 11 U.S.C. 362. The City shall be entitled to relief from the automatic stay pursuant to 11 U.S.C. 362(d) (1) or (d) (2), and the Contactor agrees to waive the notice provisions in effect pursuant to 11 U.S.C. 362 and any applicable Local Rules of the United States Bankruptcy Court. The Contactor acknowledges that such waiver is done knowingly and voluntarily.

17.4.1.2 Alternatively, in the event the City does not seek stay relief, or if stay relief is denied, the City shall be entitled to monthly adequate protection payments within the meaning of 11 U.S.C. 361. The monthly adequate protection payments shall each be in an amount determined in accordance with the Note and Mortgage executed by the Contractor in favor of the City.

17.4.1.3 In the event the Contractor files for bankruptcy under Chapter 13 of Title 11, United States Code in additional to the foregoing provisions, the Contractor agrees to cure any amounts in arrears over a period not to exceed twenty-four (24) months from the date of the confirmation order, and such payments shall be made in addition to the regular monthly payments required by the Note and mortgage. Additionally, the Contractor shall agree that the City is over secured and, therefore, entitled to interest and attorney's fees pursuant to 11 U.S.C. 506(b). Such fees shall be allowed and payable as an administrative expense. Further, in the event the Contractor has less than five (5) years of payments remaining on the Note, the Contractor agrees that the treatment afforded to the claim of the City under any confirmed plan of reorganization shall provide that the remaining payments shall be satisfied in accordance with the Note, and that the remaining payments or claim shall not be extended or amortized over a longer period than the time remaining under the Note.

17.4.2 Should this Agreement be entered into and fully executed by the Parties, and the funds have not been forwarded to Contractor, the following shall occur:

17.4.2.1 In the event the Contractor files a voluntary petition pursuant to 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303., the Contractor acknowledges that the commencement of a bankruptcy proceeding constitutes an event of default under the terms of this Agreement. Further, the Contractor acknowledges that this Agreement

constitutes an executory contract within the meaning of 11 U.S.C. 365. The Contractor acknowledges that this Agreement is not capable of being assumed pursuant to 11 U.S.C. 365(c)(2), unless the City expressly consents in writing to the assumption. In the event the City consents to the assumption, the Contractor agrees to file a motion to assume this Agreement within ten (10) days after receipt of written consent from the City, regardless of whether the bankruptcy proceeding is pending under Chapter 7, 11, or 13 of Title 11 of the United States Code. The Contractor further acknowledges that this Agreement is not capable of being assigned pursuant to 11 U.S.C. 365(b)(1).

17.5 Termination for Convenience: This Agreement may be terminated for convenience in writing by City upon thirty (30) days' written notice to Contractor (delivered by certified mail, return receipt requested) of intent to terminate and the date on which such termination becomes effective. In such case, Contractor shall be paid for all work executed and accepted by the City and costs reasonably incurred by Contractor relating to commitments which had become firm prior to the termination. No payment shall be made for profit for work/services which have not been performed or accepted.

17.6 Where the Contractor's service has been so terminated by the City, the termination shall not affect any rights of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due the Contractor by the City will not release the Contractor from liability.

17.7 The Contractor has no right, authority or ability to terminate the Work except for the wrongful withholding of any payments due the Contractor from the City.

ARTICLE 18 – DISPUTE RESOLUTION

18.1 Resolution of Disputes: Questions, claims, difficulties and disputes of whatever nature which may arise relative to the technical interpretation of the Contract Documents and fulfillment of this Agreement as to the character, quality, amount and value of any work done and materials furnished, or proposed to be done or furnished under, or by reason of, the Contract Documents which cannot be resolved by mutual agreement of City Project Manager and Contractor shall be submitted to the City Manager or his designee and Contractor's representative for resolution. Prior to any litigation being commenced, for any disputes which remain unresolved, within sixty (60) days after final completion of the Work, the Parties shall participate in mediation to address all unresolved disputes to a mediator agreed upon by the Parties. Should any objection not be resolved in mediation, the Parties retain all their legal rights and remedies provided under the laws of Florida. Failure by a Party to comply in strict accordance with the requirements of this Article, then said Party specifically waives all of its rights provided hereunder, including its rights and remedies under the laws of Florida.

18.1.1 All non-technical administrative disputes (such as billing and payment) shall be determined by Contract Administrator.

18.1.2 During the pendency of any dispute and after a determination thereof, Contractor and Contract Administrator shall act in good faith to mitigate any

potential damages including utilization of construction schedule changes and alternate means of construction. During the pendency of any dispute arising under this Agreement, other than termination herein, Contractor shall carry on the Work and adhere to the progress schedule. The Work shall not be delayed or postponed pending resolution of any disputes or disagreements.

18.1.3 For any disputes which remain unsolved, within sixty (60) calendar days after Final Completion of the Work, the Parties shall participate in mediation to address all unresolved disputes. A mediator shall be mutually agreed upon by the Parties. Should any objection not be resolved in mediation, the Parties retain all their legal rights and remedies under applicable law. If a Party objecting to a determination, fails to comply in strict accordance with the requirements of this Article, said Party specifically waives all of its rights provided hereunder, including its rights and remedies under applicable law.

ARTICLE 19 – NOTICES

19.1 All notices required by any of the Contract Documents shall be in writing and shall be deemed delivered upon mailing by certified mail, return receipt requested to the following:

To the City:

Louis Lafaurie
Project Manager
City of Fort Lauderdale
100 North Andrews Avenue, 4th Floor
Fort Lauderdale, Florida 33301-1016
Telephone: (954) 828-6538
E-mail: llafaurie@fortlauderdale.gov

with copies to:

City Manager and City Attorney
City of Fort Lauderdale
100 North Andrews Avenue
Fort Lauderdale, Florida 33301-1016

To the Contractor:

_____
_____
_____
Telephone: _____
E-mail: _____

ARTICLE 20 – LIMITATION OF LIABILITY

20.1 The City desires to enter into this Agreement only if in so doing the City can place a limit on the City's liability for any cause of action arising out of this Agreement, so that the

City's liability for any breach never exceeds the sum of $1,000. For other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Contractor expresses its willingness to enter into this Agreement with the knowledge that the Contractor's recovery from the City to any action or claim arising from the Agreement is limited to a maximum amount of $1,000, which amount shall be reduced by the amount actually paid by the City to the Contractor pursuant to this Agreement, for any action or claim arising out of this Agreement. Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended either to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes (2022), as may be amended or revised, or to extend the City's liability beyond the limits established in said Section 768.28, Florida Statutes (2022), as may be amended or revised; and no claim or award against the City shall include attorney's fees, investigative costs, expert fees, suit costs or pre-judgment interest.

20.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

ARTICLE 21 – GOVERNING LAW; WAIVER OF JURY TRIAL

21.1 The Agreement shall be interpreted and construed in accordance with, and governed by, the laws of the state of Florida. The Parties agree that the exclusive venue for any lawsuit arising from, related to, or in connection with this Agreement shall be in the state courts of the Seventeenth Judicial Circuit in and for Broward County, Florida. If any claims arising from, related to, or in connection with this Agreement must be litigated in federal court, the Parties agree that the exclusive venue for any such lawsuit shall be in the United States District Court or United States Bankruptcy Court for the Southern District of Florida. **BY ENTERING INTO THIS AGREEMENT, THE PARTIES HEREBY EXPRESSLY WAIVE ANY AND ALL RIGHTS EITHER PARTY MIGHT HAVE TO A TRIAL BY JURY OF ANY ISSUES RELATED TO THIS AGREEMENT. IF A PARTY FAILS TO WITHDRAW A REQUEST FOR A JURY TRIAL IN A LAWSUIT ARISING OUT OF THIS AGREEMENT AFTER WRITTEN NOTICE BY THE OTHER PARTY OF VIOLATION OF THIS SECTION, THE PARTY MAKING THE REQUEST FOR JURY TRIAL SHALL BE LIABLE FOR THE REASONABLE ATTORNEYS' FEES AND COSTS OF THE OTHER PARTY IN CONTESTING THE REQUEST FOR JURY TRIAL, AND SUCH AMOUNTS SHALL BE AWARDED BY THE COURT IN ADJUDICATING THE MOTION.**

ARTICLE 22 – MISCELLANEOUS

22.1 The duties and obligations imposed by this Agreement and the rights and remedies available to the Parties and, in particular but without limitation, the warranties, guaranties and obligations imposed upon the Contractor and all of the rights and remedies available to the City, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents, and the provisions of this Paragraph will survive final payment and termination or completion of this Agreement.

22.2 The Contractor shall not assign or transfer this Agreement or its rights, title or interests. The obligations undertaken by the Contractor pursuant to this Agreement shall not be delegated or assigned to any other person or firm. Violation of the terms of this Paragraph shall constitute a material breach of Agreement by the Contractor and the City any, at its discretion, cancel this Agreement and all rights, title and interest of the Contractor which shall immediately cease and terminate.

22.3 The Contractor and its employees, volunteers and agents shall be and remain as independent contractor and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be constructed to create a partnership, association or any other kind of joint undertaking or venture between the Parties.

22.4 The City reserves the right to audit the records of the Contractor relating in any way to the Work to be performed pursuant to this Agreement at any time during the performance and term of this Agreement and for a period of three (3) years after completion and acceptance by the City. If required by the City, the Contractor agrees to submit to an audit by an independent certified public accountant selected by the City. The Contractor shall allow the City to inspect, examine and review the records of the Contractor at any and all times during normal business hours during the term of this Agreement.

22.5 The remedies expressly provided in this Agreement to the City shall not be deemed to be exclusive but shall be cumulative and in addition to all other remedies in favor of the City now or later existing at law or in equity.

22.6 Should any part, term or provisions of this Agreement be decided by the courts to be invalid, illegal or in conflict with any state or federal law, the validity of the remaining portion or provision shall not be affected.

22.7 Prohibition Against Contracting With Scrutinized Companies: Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, and that it does not have business operations in Cuba or Syria, as provided in Section

287.135, Florida Statutes (2022), as may be amended or revised. The Contractor certifies that it is not on the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2022), as may be amended or revised, and that it is not engaged in a boycott of Israel. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of Section 287.135, Florida Statutes (2022), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2022), as may be amended or revised, or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2022), as may be amended or revised.

By submitting a bid or response, the company, principals, or owners certify that it is not listed on the Scrutinized Companies with Activities in Sudan List or listed on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or is engaged in business operations in Cuba or Syria.

22.8 Public Entity Crimes: In accordance with the Public Crimes Act, Section 287.133, Florida Statutes (2022), as may be amended or revised, a person or affiliate who is a contractor, consultant or other provider, who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to the City, may not submit a bid on a contract with the City for the construction or repair of a public building or public work, may not submit bids on leases of real property to the City, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with the City, and may not transact any business with the City in excess of the threshold amount provided in Section 287.017, Florida Statutes (2022), as may be amended or revised, for category two purchases for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. Violation of this section by Contractor shall result in cancellation of the City purchase and may result in Contractor debarment.

22.9 Attorney Fees: If City or Contractor incurs any expense in enforcing the terms of this Agreement through litigation, the prevailing Party in that litigation shall be reimbursed for all such costs and expenses, including but not limited to court costs, and reasonable attorney fees incurred during litigation.

22.10 Public Records

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES (2022), TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT PRRCONTRACT@FORTLAUDERDALE.GOV, 954-828-5002, CITY CLERK'S OFFICE, 100 N. ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA 33301.

Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2022), as may be amended or revised, or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this Agreement if the Contractor does not transfer the records to the City.

4. Upon completion of the Agreement, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Agreement, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Agreement, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

22.11 Non-Discrimination

The Contractor shall not discriminate against its employees based on the employee's race, color, religion, gender, gender identity, gender expression, marital status, sexual orientation, national origin, age, disability, or any other protected classification as defined by applicable law.

1. The Contractor certifies and represents that the Contractor offers the same health benefits to the domestic partners of its employees as are offered its employees' spouses or offers its employees the cash equivalent of such health benefits because it is unable to provide health benefits to its employees' domestic partners, and that the Contractor will comply with Section 2-187, Code of Ordinances of the City of Fort Lauderdale, Florida, as may be amended or revised, ("Section 2-187"), during the entire term of this Agreement.

2. The failure of the Contractor to comply with Section 2-187 shall be deemed to be a material breach of this Agreement, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

3. The City may terminate this Agreement if the Contractor fails to comply with Section 2-187.

4. The City may retain all monies due or to become due until the Contractor complies with Section 2-187.

5. The Contractor may be subject to debarment or suspension proceedings. Such proceedings will be consistent with the procedures in Section 2-183 of the Code of Ordinances of the City of Fort Lauderdale, Florida.

22.12 E-Verify

As a condition precedent to the effectiveness of this Agreement, pursuant to Section 448.095, Florida Statutes (2023), as may be amended or revised, the Contractor and its subcontractors shall register with and use the E-Verify system to electronically verify the employment eligibility of newly hired employees.

1. The Contractor shall require each of its subcontractors, if any, to provide the Contractor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The Contractor shall maintain a copy of the subcontractor's affidavit for the duration of this Agreement and in accordance with the public records requirements of this Agreement.

2. The City, the Contractor, or any subcontractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated Subsection 448.09(1), Florida Statutes (2023), as may be amended or revised, shall terminate the contract with the person or entity.

3. The City, upon good faith belief that a subcontractor knowingly violated the provisions of Subsection 448.095(5), Florida Statutes (2023), as may be amended or revised, but that the Contractor otherwise complied with Subsection 448.095(5), Florida Statutes (2023), as may be amended or revised, shall promptly notify Contractor and order the Contractor to immediately terminate the contract with the subcontractor, and the Contractor shall comply with such order.

4. A contract terminated under Subparagraph 448.095(5)(c)1. or 2., Florida Statutes (2023), as may be amended or revised, is not a breach of contract and may not be considered as such. If the City terminates this contract under Paragraph 448.095(5)(c), Florida Statutes (2023), as may be amended or revised, the Contractor may not be awarded a public contract for at least one year after the date on which the contract was terminated. The Contractor is liable for any additional costs incurred by the City as a result of termination of this Agreement.

5. Contractor shall include in each of its subcontracts, if any, the requirements set forth in this Section, including this subparagraph, requiring any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2023), as may be amended or revised, to include all of the requirements of this Section in their subcontracts. Contractor shall be responsible for compliance by any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2023), as may be amended or revised, with the requirements of Section 448.095, Florida Statutes (2023), as may be amended or revised.

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CITY

IN WITNESS OF THE FOREGOING, the Parties have set their hands and seals the day and year first written above.

CITY OF FORT LAUDERDALE, a Florida municipal corporation

By: _____
GREG CHAVARRIA
City Manager

Date: _____

ATTEST:

By: _____
DAVID R. SOLOMAN
City Clerk

Approved as to Legal Form and correctness:
D'Wayne M. Spence, Interim City Attorney

By:_____
RHONDA MONTOYA HASAN
Assistant City Attorney

CONTRACTOR

WITNESSES:

CONTRACTOR.,
a Florida company/corporation.

_____ By:_____

_____ Print Name:_____
Print Name

Title:_____

ATTEST:

_____

_____
Print Name

By:_____
Secretary

(CORPORATE SEAL)

STATE OF _____:

COUNTY OF _____:

The foregoing instrument was acknowledged before me by means of ❑ physical presence or ❑ online notarization, this _____ day of _____, 2023, by _____, (NAME OF AUTHORIZED OFFICER) as _____ (TITLE OF AUTHORIZED OFFICER), for _____ (NAME OF COMPANY), a Florida _____(TYPE OF COMPANY).

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

Personally Known_____ OR Produced Identification_____
Type of Identification Produced: _____

SECTION 01001
GENERAL REQUIREMENTS

PART 1 PROJECT DESCRIPTION

1.1 GENERAL

A. A brief description of the work is stated in the NOTICE TO CONTRACTORS. To determine the full scope of the Project or any particular part of the Project, coordinate the applicable information in these Contract Documents.

B. The work under this Contract shall be performed by the CONTRACTOR as required by the OWNER. Work will be authorized in the form of Task Orders issued to the CONTRACTOR. The CONTRCTOR shall complete all work in the Task Order within the number of calendar days stipulated in the schedule provided by the CONTRACTOR and accepted by the PROJECT MANAGER for each individual Task Order unless an extension in the time of completion is granted by the PROJECT MANAGER, as stated in the INSTRUCTIONS TO BIDDERS. Upon completion of the Work and compliance with applicable provisions in the Contract Documents, the CONTRACTOR will receive final payment for all work done.

C. The following additional information, though not all inclusive, is given to assist CONTRACTORS in their evaluation of the work required to meet the project objectives.

D. The CONTRACTOR shall become familiar with the existing operating conditions of the OWENR's sewage transmission system and take such into consideration in planning and scheduling work. No extra claims shall be made for work required to achieve conditions beyond those obtainable under normal operation of the existing collection and transmission facilities necessary to accomplish the Work.

E. The CONTRACTOR shall provide as built and data for all assets the CONTRACTOR works on in a fashion that it is compatible with the City Asset Management System "CityWorks". Delivery methods shall include desk top viewing and database import with minimal asset manipulation. Contractor shall package the data in WINCAM Vx software or later software version. Contractor is responsible to ensure the data generated by them is concordant with CITYWORKS asset management system. Any changes incurred by the contractor due to lack of coordination or preparation by the contractor, shall be corrected by the contractor at no cost to the City.

1.2 D.O.T SPECIFICATIONS

A. Portions of The Florida Department of Transportation Standard Specifications for Road and Bridge Construction and their Roadway and Traffic Design Standards, hereinafter referred to as the FDOT Standard Specifications, are referred to herein and amended, in part, and the same are hereby made part of this Contract to the extent of such references and shall be as binding upon the Contract as though reproduced herein. Such reference shall mean the current edition, including all supplements. In case of a conflict in the requirements of the FDOT Specifications and the requirements stated herein, the requirements herein shall prevail.

B. The CONTRACTOR will be required to submit MOTs for work in the county and state highways and City streets. CONTRACTOR shall coordinate with MOT's for nearby or highway work and obtain approval for all traffic control as required by the permits contained elsewhere in this section.

PART 2 SEQUENCE OF OPERATIONS

2.1 SCHEDULING

A. Prepare and submit a schedule in accordance with provisions of Section 01320 CONTSTRUCTION PROGRESS DOCUMENTATION.

B. Plan the work and carry it out with minimum interference to the operation of the existing facilities. Prior to starting the work, confer with the PROJECT MANAGER and OWNER's representative to develop an approved work schedule which will permit the facilities to function normally as practical. It may be necessary to do certain parts of the construction work outside normal business working hours to avoid undesirable conditions. The CONTRACTOR shall do this work at such times, and at no additional cost to the OWNER. Do not make connections between existing work and new work until necessary inspection and tests have been completed on the new work and it is found to conform in all respects to the requirements of the Contract Documents.

C. No work shall be started until the CONTRACTOR has received approved shop drawings, established material/delivery dates for all equipment, and received approval of the construction schedule from the ENGINEER or OWNER. The CONTRACTOR shall have sufficient manpower, equipment and material to complete the project.

D. No work shall commence without express consent of the PROJECT MANAGER or OWNER.

E. If a privately owned staging area is required, no work shall commence until approval of the facility is obtained from City Planning and Zoning in accordance with Section 14-19.2 of the Unified Land Development Regulations. Submit a copy of the approval and agreement to the CITY ENGINEER.

2.2 MOBILATION AND DEMOBILIZATON

A. The CONTRACTOR shall be responsible for mobilization and demobilization of labor, materials, and equipment.

2.3 COORDINATION

A. The CONTRACTOR shall cooperate in the coordination of separate activities in a manner that will provide the least interference with the OWNER'S operations and other CONTRACTORS and utility companies working in the area, and in the interfacing and connection of the separate elements of the overall project work.

B. If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the PROJECT MANAGER or OWNER.

2.4 SHUTDOWN OF EXISTING OPERATIONS OR UTILITIES

A. Continuous operation of the OWNER'S service functions is of critical importance. The CONTRACTOR's work shall not result in the interruption of storm, sewage, water, or solid waste service to any customers.

B. Minimizing conflicts with the ongoing area-wide commercial activities is of critical importance. The CONTRACTOR'S work shall minimize the interruption of operations at any facility business.

C. Connections to existing services or utilities, or other work that requires the temporary shutdown of any existing operations or utilities shall be planned in detail and appropriate scheduling of the work and coordinated with the OWNER or PROJECT MANAGER. Two (2) business days advanced notice shall be given in order that the OWNER or PROJECT MANAGER may witness the shutdown, tie-in, and startup. The temporary shutdown must be approved by the OWNER.

All tie-in and bypass operations shall be the responsibility of the CONTRACTOR and will be paid per its corresponding pay item in Section 01025.

D. All materials and equipment (including emergency equipment) necessary to expedite the tie-in shall be on hand prior to the shutdown of existing services or utilities.

2.5 OPERATION OF EXISTING SYSTEM PROHIBITED

A. At no time shall the CONTRATOR undertake to close off any utility lines or open valves or take any other action which would affect the operation of existing systems. The OWNER'S forces will operate all valves. Provide at least one (1) business day notice to OWNER prior to any operations.

2.6 BYPASS PUMPING

A. Wastewater flows shall be controlled through the pipeline sections and pumpstations where work is being performed. Under no circumstances can portions of the system be removed from service for periods of time in excess of that approved by the OWNER. The CONTRACTOR shall be responsible to access conditions and capacities of the existing sewer lines and pump stations and accommodate it in the project work plan to implement an acceptable bypass plan to the OWNER. Bypass pumping is paid at the unit price outlined on the bid tabulation sheet. Bypass pumping shall be in accordance with Section 02750 WASTEWATER FLOW CONTROL.

PART 3 SITE CONDITIONS

3.1 SITE INVESTIATION AND REPRESENTATION

A. The CONTRACTOR acknowledges satisfaction as to the general nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, availability of labor, water, electric power, roads, and uncertainties of weather, river and canal stages, or similar physical conditions, the character of equipment and facilities needed primarily to and during the prosecution of the work, and all other matters which can in any way affect the work or the cost thereof under this Contract.

B. Failure by the CONTRACTOR to become acquainted with the physical conditions and all the available information will not relieve the CONTRACTOR from responsibility for properly estimating the difficulty or cost of successfully performing the work.

C. The CONTRACTOR warrants that because of examination and investigation of all the aforesaid data, the CONTRACTOR can perform the work in a good and workmanlike manner and to the satisfaction of the OWNER. The OWNER assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract, and (2) the Contract expressly provides that the responsibility therefore is assumed by the OWNER.

3.2 INFORMATION ON SITE CONDITIONS

A. Information obtained by the OWNER or PROJECT MANAGER regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities as applicable, and similar data will be available for inspection at the office of the OWNER upon request. Such information is offered as supplementary information only. Neither the PROJECT MANAGER nor the OWNER assumes any responsibility for the completeness or interpretation of such supplementary information.

3.3. UTILITIES

A. The CONTRACTOR shall be responsible for determining and/or confirming, at his cost, the locations of all utilities within the project area, and shall be responsible for contacting each utility for location and notification prior to commencing work.

B. The CONTRACTOR shall contact potentially affected utilities as provided in Section 01040 COORDINATION.

C. The CONTRACTOR shall contact Sunshine State One Call at 800-432-4770 at least two (2) working days prior to any excavation and plan for locating all utilities in the project area.

3.4 CONTRACTOR'S RESPONSBILITY FOR UTILITY PROPERTIES AND SERVICE

A. Where the CONTRACTOR's operations could cause damage or inconvenience to utilities, telephone, television, power, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the CONTRACTOR with the OWNER of the utility affected.

B. Notify all utility offices which are affected by the construction operation at least two (2) working days in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose and provide temporary support for all existing underground utilities.

C. The CONTRACTOR shall be solely and directly responsible to the OWNER and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.

D. Neither the OWNER nor its officers or agents shall be responsible to the CONTRACTOR for damages because of the CONTRACTOR'S failure to protect utilities encountered in the work.

E. In the event of interruption to domestic water, sewer, storm drain, or other utility services because of accidental breakage due to construction operations, promptly notify the proper authority. Damages to City utilities shall be immediately reported by calling the 24-hour customer service line at 954-828-8000. The PROJECT MANAGER shall also be notified by phone or e-mail. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside of working hours unless prior approval is granted.

F. In the event the CONTRACTOR encounters water service lines or sewer laterals that interfere with trenching, he may, by obtaining prior approval of the property OWNER, the ENGINEER, and the OWNER, cut the service, dig through and restore the service with similar and equal materials at the CONTRACTOR'S expense.

G. The CONTRACTOR shall replace, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the ENGINEER.

3.5 INTERFERING STRUCTURES

A. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground.

B. Protect underground and aboveground existing structures from damage whether they lie within the limits of the easements obtained by the OWNER. Where such existing fences, gates, sheds, buildings, or any other structure must be removed to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the

property OWNER involved at the CONTRACTOR'S own expense. Notify the PROJECT MANAGER of any damaged underground structure and make repairs or replacements before backfilling.

C. Without additional compensation, the CONTRACTOR may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes and signposts that interfere with the CONTRACTOR's operations.

3.6 EASEMENTS

A. Where portions of the work are located on public or private property, easements and permits will be obtained by the OWNER, except as otherwise noted in these Specifications. Easements will provide for the use of property for construction purposes to the extent indicated on the easements. Copies of these easements and permits are available upon request to the OWNER. It shall be the CONTRACTOR'S responsibility to determine the adequacy of the easement obtained in every case and to abide by all requirements and provisions of the easement. The CONTRACTOR shall confine his construction operations to within the easement limits or street right-of-way limits or make special arrangements with the property OWNER or appropriate public agency for the additional area required. Any damage to the property either inside or outside of the limits of the easements provided by the OWNER or street rights-of-way, shall be the responsibility of the CONTRACTOR as specified herein. The CONTRACTOR shall provide immediate notice to the OWNER of any damage to fencing and provide temporary fencing as required to provide a functionally similar level of security. The CONTRACTOR shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the PROJECT MANAGER, the CONTRACTOR will be required to furnish the OWNER with written releases from property OWNER's or public agencies where side agreements or special easements have been made by the CONTRACTOR or where the CONTRACTOR'S operations for any reason, have not been kept within the construction right-of-way obtained by the OWNER or the street right-of-way.

B. It is anticipated that the required easements and permits will be obtained before construction is started. However, should the procurement of any easement or permit be delayed, the CONTRACTOR shall schedule and perform work around these areas until such a time as the easement permit has been secured.

C. Prior to removing an existing structure or item, provide written notice to the OWNER at least fourteen (14) days in advance of the anticipated removal.

PART 4 SAFETY AND CONVENIENCE

4.1 SAFTETY AND ACCESS

A. The CONTRACTOR shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or un-ramped grade in pedestrian sidewalk or walkway and trenches or excavations in roadway, and VOC emissions caused by CIPP pipe rehabilitation. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the work. All barricades and signs shall be clean and serviceable, in the opinion of the PROJECT MANAGER.

B. During construction, the CONTRACTOR shall construct and always maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates as applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floors, roofs, and walkways. All such barriers shall have adequate warning lights as necessary or required for safety. All lights shall be regularly maintained, and in a fully operational state at all times.

C. The CONTRACTOR shall notify all residents and businesses of planned construction at least five (5) working days prior to the start of work in the block where they are located. Such notices

shall be brochures or door-hangers with sufficient information to describe the extent and duration of the planned work. Door hangers shall also be distributed the day work is to begin to all homes in the affected area as a reminder to the Homeowner's. Notification activities shall be coordinated with the PROJECT MANAGER.

D. Homeowners and business OWNERs shall be provided reasonable access. The CONTRACTOR shall provide temporary sidewalks, bridges, or driveway access, including safe passage over open excavations as required.

E. Sewer service pipes shall be plugged prior to and during any CIPP pipe rehabilitation and the curing process of thermo-set resins. This requirement protects the Homeowners and business occupants and prevents VOC's and other unwanted odors from migrating into the building through potentially dry fixture traps.

4.2 ACCIDENT REPORTS

A. In addition, the CONTRACTOR must promptly report in writing to the PROJECT MANAGER all accidents whatsoever arising out of, or in connection with, the performance of the work whether on or adjacent to, the site, giving full details and statements of witnesses. If death or serious injuries or damages are caused, the accident shall be reported immediately by telephone or messenger to the PROJECT MANAGER.

B. If a claim is made by anyone against the CONTRACTOR or any SUBCONTRACTOR on account of any accident, the CONTRACTOR shall promptly report the facts in writing the PROJECT MANAGER, giving full details of the claim.

4.3 SAFE ACCESS BY FEDERAL, STATE AND LOCAL GOVERNEMENT OFFICIALS

A. Authorized representatives of the state, federal or local governmental agencies, shall at all times have safe access to the work, and the CONTRACTOR shall provide proper facilities for such access and inspection.

4.4. PROTECTION OF PROPERTY

A. Protect stored materials located adjacent to the proposed work. Notify property owners affected by the construction as least two (2) business days in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding two (2) hours unless the CONTRACTOR has made special arrangements with the affected persons.

B. The CONTRACTOR shall identify and isolate his active work zone in such a manner as to exclude all personnel not employed by him, the PROJECT MANAGER, and the OWNER.

4.5 FIRE PREVENTION AND PROTECTION

A. The CONTRACTOR shall perform all work in a fire-safe manner. He shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The CONTRACTOR shall comply with applicable federal, state, and local fire-presentation regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

4.6 ACCESS FOR POLICE, FIRE AND POSTAL SERVICE

A. Notify the fire department and police department before closing any street or portion thereof. No closing shall be made without the OWNER'S approval of MOT plan. Notify said departments

when the streets are again passable for emergency vehicles. Do not block off emergency vehicle assess to consecutive arterial crossings or dead-end-streets, more than 300 linear feet, without special written permission from the fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access.

B. The CONTRACTOR shall leave a night emergency telephone number or numbers with the police department, the PROJECT MANAGER, and the OWNER, so that contact may be always made easily in case of barricade and flare trouble or other emergencies.

C. Maintain proposal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service and the completion of the work in each area, replace them in their original location and in a condition satisfactory to the U.S. Postal Service.

PART 5 PRESERVATION, RESORATION AND CLEANUP

5.1 SITE RESTORATION AND CLEANUP

A. At all times during the work, keep the premises clean and orderly, and upon completion of the work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, shrubbery, or fences, regardless of whether these are on private property, or on state, county, or city rights-of-way. Remove all excavated materials from grassed and planted areas and leave these surfaces in a condition equivalent to their original condition. Replace excavated areas as specified in Section 02320 TRENCH BACKFILL, raked, and graded to conform to their original contours.

5.2 FINISHING OF SITE, BORROW AND STORAGE AREAS

A. Upon completion of the project, all areas used by the CONTRACTOR shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain. Grassed areas shall be restored as specified.

PART 6 PERMITS

6.1 GENERAL

A. Permits obtained by the OWNER may include the following:
1. Broward County Engineering: The CONTRACTOR shall obtain a construction permit for work in any Broward County rights-of-way, Pre-approval has been obtained by the ENGINEER.

B. Permits to be obtained by the CONTRACTOR may include, but are not limited to the following:
1. Local and County Building Permits
2. Local, County and State contracting licenses.
3. Tree removal and trimming permits.
4. BCEPD: Dewatering permit

C. The CONTRACTOR shall comply with all applicable permit conditions. <u>For MOT Broward County permit approval, the CONTRACTOR shall ensure that he obtains pre-approval from (1) Signal Design (2) Systems Communication (3) Schools/ Traffic Calming and (4) Maintenance of Traffic reviewers.</u>

D. For Broward County MOT permit submittal CONTRACTOR shall contact: Mr. Lei Cai (954) 847-2653 or (954) 847-2600, 2300 W. Commercial Boulevard, Fort Lauderdale, Florida 33309.

END OF SECTION

SECTION 01005
INTENT OF STANDARD DETAILS AND SPECIFICATONS

A. Intent of specification and standard details is to cover an installation complete in every respect. It is not intended to give every detail. The OWNER will not be responsible for absence of any detail which the CONTRACTOR may require, nor for any special construction which may be found necessary as work progresses. If an item is either indicated or specified it shall be considered sufficient for inclusion of said item in contract. The CONTRACTOR shall furnish and install materials and equipment usually furnished with such systems and as needed to complete an operating installation, whether mentioned or not, which are customary to its trade.

B. Incidental accessories not usually shown or specified but which are necessary for the proper installation and operations shall be included in work without additional cost to the OWNER, the same as if herein specified.

C. Any apparatus, appliance, material or work not shown on the standard details but mentioned in the Specifications, or vice versa, or any incidental accessories necessary to make the work complete and ready for operation, shall be furnished, delivered, and installed by the CONTRACTOR without additional costs to the OWNER.

D. Standard details are diagrammatic and indicate the general arrangement of systems and work indicated (do not scale the standard details). Consult the OWNER or ENGINEER for exact locations of fixtures, appurtenances, etc., where these items are not definitely located.

E. The OWNER's or ENGINEER's interpretation of the standard details and Specifications shall be final and binding upon CONTRACTOR.

F. The CONTRACTOR shall visit site prior to submitting bid, and thoroughly investigate and verify all conditions under which work shall be performed.

G. The most up to date version of the City's Standard Details are available on the City's webpage and on this specification attachments.

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The scope of work under this contract will include, but is not limited to the following project components as issued by individual Task Orders under the contract:

1. The CONTRACTOR shall provide all materials, labor, and equipment necessary to rehabilitate City sewer mains, laterals, cleanouts, and manholes in accordance with the associated Specifications.

2. The CONTRACTOR shall provide all materials, labor, and equipment necessary to provide Closed Circuit Television (CCTV) recordings of the CITY sewer systems for inspection purposes in accordance with project Specifications. Post rehabilitation CCTV shall be provided by the CONTRACTOR, at its own cost. Such work shall be considered incidental to the project work.

3. The CONTRACTOR shall provide all materials, labor, and equipment necessary to clean roots, grease and tuberculation from the CITY'S sewer pipes as required by task ordered issued and in accordance with the project Specifications.

4. The CONTRACTOR shall provide all materials, labor, and equipment necessary to perform excavated point repairs in accordance with the project Specifications.

5. The CONTRACTOR shall restore sidewalks, curbs, trees, sod, sprinkler, and signs damaged during construction that are outside of the limits of construction, at its own cost. Such restoration is considered incidental to the project work.

6. The CONTRACTOR shall coordinate with Broward County Traffic the restoration and replacement of signs and striping to meet the standards at the time the restoration takes place. The CONTRACTOR shall be fully responsible for compliance.

7. The CONTRACTOR shall retain the services of a certified independent soils and materials testing lab to provide all soils, concrete, asphalt, density, and materials testing as required. Testing results shall be submitted to the ENGINEER for review and approval at the time the testing results are provided to the CONTRACTOR.

8. Excavation repairs (Open Cut Excavated Point Repairs) or new installation related to mains and laterals connections which alter original field conditions will require at the very least as built redline drawings and such determination will be made by the CITY'S PROJECT MANAGER OR CITY ENGINEER. Furthermore, such as built must be submitted in PDF file format. All costs associated with the survey work to generate such as built preparation shall be the responsibility of the CONTRACTOR. CONTRACTOR must submit such information to the CITY's Public Works CAD department through the PROJECT MANAGER.

9. The CONTRACTOR shall be responsible for maintaining up to date redline as-built drawings, on site, at all times during construction. All as- built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. The CONTRACTOR shall provide the CITY with a minimum of three (3) sets of signed and sealed record drawings (final as-builts) and a CD of the electronic drawing files created in the latest version of AutoCAD. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the CONTRACTOR.

10. The CONTRACTOR shall be responsible for all requirements listed elsewhere in these specifications concerning written submittals to the OWNER, including but not limited to the following:

    i. Requests for clarification concerning any pay item with respect to measurement or the extent of associated work intended to be included or excluded. Such requests shall be made prior to CONTRACTOR's submittal of pricing for any work order to ensure prices bid are inclusive of all required cost items.

    ii. Requests for information or clarification concerning approved products, testing requirements, or any other technical requirement of these specifications. Any proposed "equal" or "substitute" to specified products shall require submittal of shop drawings, technical data, and installation references as may be required by the OWNER for the specific case.

    iii. Construction schedules, both initial and updated as required with pay applications. Construction schedules shall identify such items as permit reviews and any necessary work by others that may affect CONTRACTOR's ability to complete the associated work within the schedule provided. Requests for time extensions shall require formal change orders to the contract and contain appropriate documentation to support and justify the additional time requested.

    iv. As-built drawings documenting the installation of any new asset, the replacement of any existing asset for which a significant change of alignment occurs, or the installation/replacement of an asset for which site-specific conditions require adjustment to requirements of the OWNER's standard details.

11. The CONTRACTOR shall provide as built and data for all assets the CONTRACTOR works on in a fashion that it is compatible with the City Asset Management System "CityWorks". Delivery methods shall include desk top viewing and database import with minimal asset manipulation. Contractor shall package the data in

WINCAM Vx software or later software version. Contractor is responsible to ensure the data generated by them is concordant with CITYWORKS asset management system. Any changes incurred by the contractor due to lack of coordination or preparation by the contractor, shall be corrected by the contractor at no cost to the City.

B. Removal and installation and rehabilitation of sewer mains, laterals and manholes includes, but is not limited to:
    1. Traffic control (MOT) as needed, during construction activities.
    2. Bypass pumping, as required, during construction activities.
    3. Dewatering to be provided as required due to field conditions. Dewatering plans to be obtained by CONTRACTOR and approved by Broward County DEP, prior to construction.
    4. Site restoration to a condition similar to what existed prior to any excavation, or as indicated on the plans.
    5. Compliance with applicable permits.

1.2 WORK NOT COVERED BY CONTRACT DOCUMENTS

A. Any associated work on any sewer main, manhole or service lateral not specifically identified in the contract documents or in writing by ENGINEER or OWNER.

PART 2 PRODUCTS (NOT USED)
PART 3 EXECUTION

3.1 ORDER OF OPERATIONS

A. For the OWNER to receive the maximum benefit from the Collection System rehabilitation work, required by this contract, and enhance property OWNER satisfaction and take necessary measurements to protect the public during the performance of the work, the OWNER requires the CONTRACTOR to perform all work in accordance with the following sequence, pursuant to the requirements of the detailed specifications herein provided.

1. Perform all CCTV inspection required to assess rehabilitation needs of the City's sewer assets as defined in Section 02752.

2. Locate and mark all laterals for the installation of a compliant clean-out as defined in Section 02759 or 02760.

3. Install a compliant clean-out per CITY Standard Details on all laterals within the scope of this contract as defined in Section 02759 or Section 02760. Under no circumstances will a cured-in-place pipe (CIPP) be installed in a main or a lateral pipe until a cleanout has been installed on every service pipe that connects to the main pipe scheduled for CIPP rehabilitation

4. Clean, descale, remove roots and grease from all pipelines which are to be rehabilitated with CIPP, as specified in Section 02751.

5. Seal all active infiltration and miscellaneous leakage into all pipelines included in the scope of this contract, as per Section 02134.

6. Plug all lateral flows at the cleanout. Prior to any CIPP installation/processing; all service pipes connected to the main pipe shall be blocked at the cleanout. Blocking the service pipe prevents system flow from mixing with the liner and prevents any CIPP emissions from migrating into the building as defined in Sections 02750.

7. Install liner in sewer mains, included in the contract scope, as defined in Section 02765.

8. Install liner in lateral pipelines as defined, in the contract as defined in Section 02770.

9. Rehabilitate all manholes, included in the contact, as defined in Section 02958.

10. Perform site grading, restoration, and stabilization.

END OF SECTION

SECTION 01025
MEASUREMENTS AND PAYMENT

PART 1 GENERAL

1.1 SUBMITALS

A. Informational:

1. Submit schedule on OWNER's form.

2. Application for Payment

3. Final Application for Payment

4. SCOPE OF WORK

a. Payments to the CONTRACTOR shall be made based on the Bid Proposal as full and complete payment for furnishing all materials, labor, tools and equipment, and for performing all operations necessary to complete the work included in the Contract Documents. Such compensation shall also include payments for any loss or damages arising directly or indirectly from the work, or from any discrepancies between the actual quantities of work and those shown in the Contract Documents.

b. The prices stated in the Bid Proposal include all costs and expenses for taxes, labor, equipment, materials, commissions, transportation charges and expenses, patent fees and royalties, labor for handling materials during inspection, together with any and all other costs and expenses for performing and completing the work as shown on the details and specified herein. The Basis of Payment for an item at the price shown in the Bid Proposal shall be in accordance with its description of the item in this Section and as related to the work specified. Unit prices will be applied to the actual quantities furnished and installed in conformance with the Contract Documents. The items listed below refer to and are the same pay items listed in the Bid Forms. They constitute all of the pay items for the completion of the work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, services, field offices, layout surveys, job signs, sanitary requirements, testing, safety devices, approval and record drawings, water supplies, power, underground utility locating, maintenance of traffic, site preparation, removal of waste, site cleanup, watchmen, bonds, insurance, mobilization, demobilization, transportation, storage, and any other requirements of the General Conditions and Bidding and Contract Requirements. Compensation for all such services, equipment and materials shall be included in the prices stipulated for the unit pay items listed herein.

c. The CONTRACTOR's attention is called to the fact that the quotations for the various items of work are intended to establish a total price for completing the work in its entirety. Should the CONTRACTOR feel that the cost for any item of work has not been established in the Bid Form or this Section, the cost for that Work shall be included in some other applicable Bid Item, so that the Proposal for the project reflects the total price for completing the work in its entirety. It is intended that all work required to complete this Contract will be included in the various items as described herein.

d. In the event of any conflict among sections of these contract documents, the order of precedence shall be as follows: The OWNER's *Standard Details* and front-end documents; this section (Section 01025, Measurement and Payment); and the remaining sections of these Technical Specifications.

e. If repairs to laterals, mains, manholes, force mains, utilities, or any other public or private property are required due to damage caused by the CONTRACTOR's operations, the CONTRACTOR shall provide and employ all necessary labor, equipment, and materials, at no additional cost, to complete such repairs in accordance with applicable provisions of these specifications. This shall include but not be limited to materials for repair, if required, including pipe, fittings and specials, pipe bedding, and materials for surface restoration; transportation and handling costs delivered to the work site; any bypass pumping; providing provisional sewers to maintain service; complying with the State of Florida Trench Safety Act, including shoring; removal, transportation and disposal of existing sewer excavation; supporting and protecting existing utilities as required; dewatering; sheeting and shoring, if necessary; furnishing and installing replacement pipe, fittings and repair couplings; unloading material and placing it in the trench; cutting pipe; furnishing and installing joint materials including lubricant; making all connections within the lines to existing sewers, laterals and structures; placing and compacting bedding and backfill; furnishing and installing additional suitable backfill material, if required; furnishing all materials and equipment required to clean and test the sewer; cleaning and testing the sewer; temporary paving installation and removal; permanent paving replacement; replacement of pavement markings as existed before repair; replacing utilities, catch basins, manholes, trees, grass, shrubs, mail boxes, sprinkler systems, concrete or rock bed driveways, sidewalk and all other similar items, to original locations and to equal or better than original conditions; obtaining and paying for any necessary permits; satisfying all requirements of the permits, and all other appurtenant and miscellaneous items and work including final cleanup.

f. The OWNER will not provide any space or place to store materials for this project. No payment will be made for stored materials.

g. The OWNER will not provide for disposal of any solids resulting from sewer cleaning. The CONTRACTOR shall obtain permits and plan as required to properly dispose of solids. All solids or semisolids resulting from the cleaning operations shall be removed from the site and disposed of by the CONTRACTOR in a legal and sanitary manner as approved by appropriate authorities, at the CONTRACTOR's cost. Where applicable, the OWNER will waive permit fees for CONTRACTOR. Water usage by the CONTRACTOR shall be metered using a meter to be obtained from the OWNER, but the OWNER will waive charges for the cost of such usage.

h. Whenever "Limits of Construction" is referred to, unless specifically defined otherwise, the limit of construction shall be within an area 7.5 feet each side of the centerline of the pipe and no more than five feet beyond the end of the new pipe installed.

i. The term "OWNER" as used throughout these contract documents shall mean the actual Owner or a third-party representative who may be designated by the Owner to take responsibility for various functions under this contract.

5. CONTRACTOR RESPONSIBILITIES

a. The CONTRACTOR shall be solely and directly responsible to the OWNER and operators of utilities, telephone, television, power, water, or sewer systems for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.

b. Neither the OWNER nor its officers or agents shall be responsible to the CONTRACTOR for damages because of the CONTRACTOR's failure to protect utilities encountered in the Work.

c. In the event of interruption to domestic water, sewer, storm drain, or other utility services because of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

d. In the event the CONTRACTOR encounters water service lines or sewer laterals that interfere with trenching, CONTRACTOR may, by obtaining prior approval of the property owner, and the OWNER, cut the service, dig through, and restore the service with similar and equal materials at the CONTRACTOR's expense.

e. The CONTRACTOR shall replace, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the OWNER.

f. Telephone and communications drop connections and systems may extend throughout the project area. Properly located cable, conduit, interface equipment, pull or junction boxes and other signal or systems equipment damaged by the CONRACTOR shall be replaced at the CONTRACTOR’s expense. Damaged cable shall be replaced as an entire run, from junction box to junction box.

g. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the OWNER. Where such existing fences, gates, sheds, buildings, or any other structure must be removed to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at the CONTRACTOR's own expense. Notify the OWNER of any damaged underground structure and make repairs or replacements before backfilling.

h. Without additional compensation, the CONTRACTOR may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the CONTRACTOR's operations.

i. Any damage to property, either inside or outside the limits of the easements provided by the OWNER or street rights of way, shall be the responsibility of the CONTRACTOR as specified herein. The CONTRACTOR shall provide immediate notice to the OWNER of any damage to fencing and provide temporary fencing as required to provide a functional similar level of security. The CONTRACTOR shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the OWNER, the CONTRACTOR will be required to furnish the OWNER with written releases from property owners or public agencies where side agreements or special easements have been made by the CONTRACTOR or where the CONTRACTOR's operations, for any reason, have not been kept within the construction right of way obtained by the OWNER or the street right of way.

j. The CONTRACTOR shall be responsible for all damage to private property where work related activities have occurred without proper easement or authorization. The OWNER may withhold payment to the CONTRACTOR pending resolution of any claims by private owners.

1.2 SCHEDULE

A. Prepare a schedule for the work in accordance with the requirements of Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

B. Unit Price Work: Reflect unit price quantity and price breakdown from confirmed Bid Form.

C. Lump Sum Work:

1. Reflect schedule format included in conformed Bid Form.

2. List Bonds and insurance premiums, mobilization, demobilization, allowance items and contract closeout separately.

3. Break down by Divisions 2 through 16 with appropriate subdivision of each specification.

D. An unbalanced for front-end loaded schedule will not be acceptable and may result in delay of payments.

E. Summarization of all the work shall equal the Contract Price.

1.3 APPLICATION FOR PAYMENT

A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment and include Request for Payment for Materials and Equipment on hand as applicable. Execute Certification by authorized officer of CONTRACTOR.

B. Use detailed Application for Payment Form provided by PROJECT MANAGER.

C. Include each portion of WORK and the unit price breakdown for the WORK to be paid on unit price basis, and a listing of OWNER-selected equipment, if applicable, and allowances, as appropriate.

D. Preparation:

1. Round values to nearest dollar.

2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form.

3. Verify required signatures are current prior to submittal.

4. Provide subcontractor identification forms for each Task Order.

5. Provide subcontractor partial release of lien for all partial applications for payment submitted for pay application after the initial submittal.

6. Provide final release of lien documents for each CONTRACTOR, subcontractor, and supplier for all final payment applications.

7. Submit 4 copies of Application for Payment with original signatures by an approved signor as listed in Sunbiz printed on 8.5" x 14" paper, including a Check list, Transmittal Summary Form and detailed Application for Payment Form, a listing of materials on hand as applicable, completion report for all pay items listed in pay application, complete post rehabilitation photos and CCTV files, boil logs, and all other supporting data as may be requested by PROJECT MANAGER and based on the WORK performed.

8. Supporting data may be submitted electronically. Each log must be provided as an individual digital (e.g., PDF, Excel or Word) file and named using OWNER's labeling system. Format shall

be provided at the pre-construction meeting. Supporting data may include the following, along with anything additional requested by the PROJECT MANAGER at the pre-construction meeting:

- Main line liner cure logs
- Lateral liner logs
- Sectional installation logs
- Manhole inspection logs on CITY form
- Cleanout installation logs. Certified professional survey grade GIS latitude and longitude location point for existing or newly installed cleanouts to be submitted for every clean out within the pump station collection system.
- Pre-rehabilitation inspection CCTV videos and PDF reports
- Post-rehabilitation inspection CCTV videos and PDF reports
- Dye test log on standard CITY form
- Marked cleanout installation photograph and certified professional survey grade GIS latitude and longitude location point for existing or newly installed cleanouts to be submitted for every clean out within the pump station collection system.
- Post- cleanout installation photograph and certified professional survey grade GIS latitude and longitude location point for existing or newly installed cleanouts to be submitted for every clean out within the pump station collection system.
- Pre-point repair photographs
- Post-point repair photographs
- Invoice Status Spreadsheet (Excel)
- Progress Report on Work Completed (PDF)
- Incident Report Log Spreadsheet (Excel)
- Work Order (WO) Tracker Spreadsheet (Excel)
- WO and Change Order (CO) Requiring Approval by CITY Spreadsheet (Excel)

9. All payment applications shall be presented in bound format complete with all supporting documentation and labeled with the project number, task order number, and pay application number. Payment applications presented unbound or without all required documentation will be rejected as incomplete.
10. Provide affidavit on behalf of CONTRACTOR.
11. Provide updated overall construction schedule, for entire construction period, with each pay application.

1.4 MEASURMENT – GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and Specifications as specified in National Institute of Standards and Technology, Handbook 44.

B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by CONTRACTOR and certified accurate by state agency responsible. Weight or load slip shall be obtained from weigher and delivered to ENGINEER or OWNERS representative at point of delivery of material.

C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff and provided further that car weights will not be acceptable for material to be passed through mixing plants.

D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by OWNER. Each vehicle shall bear a plainly legible identification mark.

E. Materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.

F. The quantities for payment under this Contract shall be determined by actual measurement of the completed items, in place, ready for service and accepted by the OWNER unless otherwise specified. The OWNER will witness all field measurements.

G. When depth of cuts is indicated in the bid items, they shall be measured vertically from the existing grade at excavation point, paved or unpaved, to the pipe invert.

H. The quantities stated in the Bid Proposal are approximate only and are intended to serve as a basis for the comparison of bids and to fix the approximate amount of the cost of the Project. The OWNER does not expressly or impliedly agree that the actual amount of the work to be done in the performance of the contract will correspond with the quantities in the Bid Proposal; the amount of work to be done may be more or less than the said quantities and may be increased or decreased by the OWNER as circumstances may require. The increase or decrease of any quantity shall not be regarded as grounds for an increase in the unit price or in the time allowed for the completion of the work, except as provided in the Contract Documents.

I. Payment items for cleaning and televising of mains and laterals will apply when sewer is cleaned and televised for inspection only, or when a sewer repair is not performed due to changed field conditions revealed by the pre-repair video inspection. Cleaning and television inspection performed to prepare for a repair or to document a completed repair are not considered separate pay items. Costs for such cleaning and TV inspection shall be included in the contract unit cost for each particular repair. Lateral inspection shall be performed using a camera launched from the main unless conditions within the sewer require lateral inspection from the cleanout.

J. The television inspection requirements, as well as other testing, documentation, or procedural requirements throughout these specifications, may be made less stringent on a case-by-case basis at the OWNER's sole discretion.

K. The OWNER may request inspection for the purpose of locating or confirming defects in sewer mains and laterals for subsequent repair under this Contract. Where such mains and laterals are subsequently assigned to the Contractor for repair during this Contract, the initial inspection cost shall be deducted from the repair cost.

L. Units of measure shown on Bid Form shall be as follows, unless specified otherwise. All methods of measurement shall be approved by the OWNER.

Item	Method of Measurement
AC	Acre- Field Measure
AL	Allowance
CY	Cubic Yard- Field Measure within City limits specified or shown, or measured in vehicle by volume, as specified.
EA	Each- Field Count
DAY	Daily
GAL	Gallon-Field Measure
HR	Hour
LB	Pound(s)- Weight Measure by Scale
LF	Linear Foot- Field Measure
LS	Lump Sum- Unit is one; no measurement required.
N/A	Not Applicable
SEG	Pipe Segment from Manhole to Adjacent Manhole, or Lateral Pipe
SF	Square Foot
SY	Square Yard
TON	Ton- Weight Measure by Scale (2,000 Pounds)
VF	Vertical Foot

1.5 PAYMENT

A. GENERAL:

1. Progress payments shall be submitted monthly. The timeframe of the work shall be the first day of the month to the last day of the month.

2. The date for the CONTRACTOR's submission of monthly Application for Payment shall be established at the Preconstruction Conference.

3. The CONTRACTOR shall be solely and directly responsible to the OWNER and operators of utilities, telephone, television, power, water, or sewer systems for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the construction operations under this Contract.

4. Neither the OWNER nor its officers or agents shall be responsible to the CONTRACTOR for damages because of a CONTRACTOR's failure to protect utilities encountered in the work.

5. In the event of interruption to domestic water, sewer, storm drain, or other utility services because of accidental breakage due to the construction operations, promptly notified the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all cost of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

6. In the event the CONTRACTOR encounters water service lines or sewer laterals that interfere with trenching, he may, by obtaining prior approval of the property owner, the ENGINEER, and the OWNER, cut the service, dig through, and restore the service with similar and equal materials at the CONTRACTOR's expense.

7. The CONTRACTOR shall replace at his own expense all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract Documents or ordered by the City of Fort Lauderdale.

8. Telephone and communication drop connections and systems makes end throughout the project area. Properly located cable, conduit, interface equipment, pull or junction boxes and other signal or systems equipment damaged by the CONTRACTOR shall be replaced at the CONTRACTOR's expense. Damaged cable should be replaced as an entire run, from junction box to junction box.

9. Protect underground an above ground existing structures from damage, whether they lie within the limits of the easements obtained by the OWNER. Where such existing fences, gates, sheds, buildings, or any other structure must be removed to properly carry out the construction, or are damaged during that construction, restore to their original condition to the satisfaction of the property owner involved at the CONTRACTORs own expense. Notify the ENGINEER of any damaged underground structure and make repairs or replacements before backfilling.

10. Without additional compensation, the CONTRACTOR may remove and shall place in a condition as good as or better than original, such as small miscellaneous structures as fences, mailboxes, and signposts that interfere with the CONTRACTOR's operations.

11. Any damage to property, either inside or outside the limits of the easements provided by the OWNER or street rights of way, shall be the responsibility of the CONTRACTOR as specified herein. The CONTRACTOR shall provide immediate notice to the OWNER of any damage to fencing and provide temporary fencing as required to provide a functionally similar level of security. The contractor shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the project manager, the CONTRACTOR will be required to furnish the OWNER with written releases from property owners or public agencies where side agreements or special easements have been made by the CONTRACTOR or where the CONTRACTOR's operations for any reason, have not been kept within the construction Right-of-way obtained by the OWNER or the street Right-of-way.

12. The CONTRACTOR shall be responsible for all damage to private property where work related activities have occurred without proper easement or authorization. The OWNER may withhold payment to the CONTRACTOR pending resolution of any claims by private owners.

13. Payment items for cleaning and televising of mains and laterals will apply when sewer is cleaned and televised for inspection only, or when a sewer repair is not performed due to changed field conditions revealed by the pre-repair video inspection. Cleaning and television inspection performed to prepare for a repair or to document a completed repair are not considered

separate pay items. Costs for such cleaning and TV inspection shall be included in the contract unit cost for each repair.

14. Use detailed *Periodic Estimate for Partial Payment* Form provided by OWNER. Item descriptions, numbers, units, unit costs, and quantities shall be the same as on the Task Order. List each change order executed prior to date of submission as a separate line item in the appropriate space. *Periodic Estimate for Partial Payment* Form shall also be submitted in Microsoft Excel with each payment application.

15. Vendor's legal name as listed on Florida's SunBiz (https://dos.myflorida.com/sunbiz) shall be used on all forms related to the payment application.

16. Payment application documents must be signed by an authorized representative as listed on SunBiz. Authorized signatory may provide a signed letter on company letterhead stating that someone else in the organization may sign documents on their behalf (signature authorization letter).

17. Spreadsheets showing work completed shall be submitted in Microsoft Excel with each payment application. Spreadsheets shall include asset ID, other relevant asset information such as address of asset, date of work for each pay item, and number of pay items being billed. Totals shall match what is billed on the payment application.

18. An updated overall construction schedule, for the entire construction period, shall be submitted with each payment application.

19. Payment applications may be submitted in hard copy or electronically.

20. If payment application is submitted electronically, documents shall be provided as a single PDF file packaged in the following order. Electronic signatures or scans of original documents with handwritten signatures are acceptable.

    a. *Periodic Estimate for Partial Payment* Form
    b. Signature authorization letter (if applicable)
    c. Work completion spreadsheet(s)
    d. Billing backup for pass-through costs
    e. Contractor's Release of Lien (ROL)
    f. Subcontractor's ROL(s)
    g. Purchase Order
    h. Task Order
    i. SunBiz printout from month of payment application submittal.

21. If payment application is submitted in hard copy, the same documents listed under (a) shall be submitted bound in a three-ring binder. Four (4) originals of the *Periodic Estimate for Partial Payment* Form printed on 8.5" x 14" paper are required. One (1) copy of each of the other documents is required. Any document requiring a signature shall be provided with original signatures.

22. Supporting data may be submitted electronically. Each item must be provided as an individual digital file and named using OWNER's labeling system. Format shall be provided at the pre-construction meeting. Supporting data may include the following, along with anything additional requested by the OWNER at the pre-construction meeting.

    1. Mainline liner cure logs
    2. Lateral liner cure logs
    3. Sectional liner installation logs
    4. Cleanout installation logs
    5. Pre-rehabilitation inspection CCTV videos and pdf survey reports
    6. Post-rehabilitation inspection CCTV videos and pdf survey reports
    7. Dye test log on standard City form
    8. Pre-repair photographs for excavated repairs
    9. Post-repair photographs for excavated repairs

B. Time- and- materials work related to pass-through costs.

    1. When field conditions require work under the allowance allocated for such purposes, the OWNER may request the CONTRACTOR to provide a Not-to-Exceed estimate for such work using unit prices for labor, equipment, materials, and services and estimated amounts for items not listed on the bid form that must be rented or purchased. Hourly rates must be justifiable and similar to typical or local prices.

    2. The CONTRACTOR shall not initiate work prior to approval of the referenced estimate by the OWNER.

    3. CONTRACTOR shall create daily time and material tickets for all applicable labor, equipment, materials, and services on a form provided by the OWNER for both self-performed and sub-contracted services. Time and material tickets shall be approved and signed by OWNER field representative and provided with the invoice for payment.

    4. Upon completion of work, the CONTRACTOR shall bill the OWNER using the unit prices bid for labor, equipment, materials, and services based on actual quantities used. Invoices for subcontractor services, equipment, materials, or other related items shall be provided with the invoice for payment. Subcontracted services, rentals, and purchased materials shall be a passed through costs and not subject to a markup.

    5. The OWNER reserves the right to request cost verification for parts, materials, or permit fees. The OWNER also reserves the right to purchase and supply pipe, fittings, equipment, or other items or material directly for use by the CONTRACTOR at no cost to the OWNER.

    6. Should the CONTRACTOR elect to subcontract any portion of an individual project, the CONTRACTOR must first check the OWNER to identify if any OWNER contacts can be utilized for required services.

C. Payment for Lump Sum Work covers all Work specified or shown for the following items. Unit price items covers all the work necessary to furnish and install the following items:

ITEM	DESCRIPTION
Install Cured in-place Mainline liner - Main	Measurement for payment of furnishing an Installing Main Line Liner will be based upon the actual quantity of linear feet of liner installed. Payment for furnishing an installing mainline liner will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the lining operation, and all other specified work in accordance with section 02765 CURED-IN-PLACE PIPE LINING - MAIN. **Furnish and Install:** **(1) 6-inch diameter x 4.5mm CIPP Liner LF** **(2) 8-inch x 6.0mm CIPP Liner LF** **(3) 10- inch x 6.0mm CIPP Liner LF** **(4) 12-inch x 6.0mm CIPP Liner LF** **(5) 15-inch x 7.5mm CIPP Liner LF** **(6) 18-inch x9.0mm CIPP Liner LF** **(7) 21-inch x 9.0mm CIPP Liner LF** **(8) 24-inch x 12.0mm CIPP Liner LF**
UV Light Glass Fiber Reinforced Plastic (GRP) Cured-in-Place Pipe- Main	Measurement for payment of furnishing an installing UV Light GFRP Main Line Liner will be based upon the actual quantity of linear feet of liner installed. Payment for furnishing an installing UV GFRP mainline liner will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the lining operation, and all other specified work in accordance with section 02766 UV LIGHT GFRP REINFORCED CURED-IN-PLACE-PIPE **Furnish and Install:** **(9) 6-inch diameter x 4.5mm CIPP Liner LF** **(10) 8-inch x 6.0mm CIPP Liner LF** **(11) 10- inch x 6.0mm CIPP Liner LF** **(12) 12-inch x 6.0mm CIPP Liner LF** **(13) 15-inch x 7.5mm CIPP Liner LF** **(14) 18-inch x9.0mm CIPP Liner LF** **(15) 21-inch x 9.0mm CIPP Liner LF** **(16) 24-inch x 12.0mm CIPP Liner LF**
Reinstate Lateral	Measurement for payment of Reinstating Sewer Laterals after lining existing gravity mains will be based upon the quantity of individual reinstatements identified by the OWNERS representative- and- upon completion of the work, the number of reinstatements verified as cut and brushed to the satisfaction of the PROJECT MANAGER after review of the post CCTV videos. Payment for reinstatement of sewer laterals will be made at the unit price, per number identified in the task order and includes but is not limited to transportation costs, storing, mobilization and demobilization costs, furnishing an installing all necessary components, labor and materials, CCTV, and all other specified work in accordance with Section 02765

	CURED-IN-PLACE PIPE LINING **(17) Reinstate Sewer Laterals EA**
Re-Cut Existing Service Lateral	Measurement for payment of Full Cut of Existing Sewer Laterals to restore laterals insufficiently reinstated by others will be based upon the quantity of individual restorations identified by the OWNERs representative and upon completion of the work, the number of restorations verified as cut and brushed to the satisfaction of the project manager after review of the post CCTV videos. Payment for full cut of existing sewer laterals will be made at the unit price, per number identified in the task order and includes but is not limited to transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, labor and materials, CCTV, and all other specified work in accordance with Section 02765 CURED-IN-PLACE PIPE LINING **(18) Full Cut Existing Sewer Lateral EA**
Remove Mainline Protruding Service (Hammer Tap)	Measurement for payment of Removing Mainline Protruding Service will be based upon the quantity of protruding services removed. Payment for removing mainline protruding services will be made at the unit price, per number of identified in the bid schedule an includes but is not limited to all two transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, labor and materials, and CCTV. **(19) Remove Mainline Protruding Service EA**
Sewer Main Cleaning and TV Inspection	Measurement for payment for Sewer Main Cleaning and TV Inspection will be based upon the actual quantity of linear feet of mainline sewer cleaned and inspected via closed circuit television as requested in writing by OWNER, as measured in the field. Payment for cleaning and TV inspection will be made at the unit price identified in the Bid Schedule, and includes but is not limited to mobilization and demobilization costs, cleaning, and all other effort required to perform the work in accordance with Section 02752 PIPE INSPECTION (MAINS AND LATERALS) **(20) Cleaning and TV Inspection 6-inch to 12-inch LF** **(21) Cleaning and TV Inspection 14-inch to 18-inch LF** **(22) Cleaning and TV Inspection 21-inch to 24-inch LF**
Cut and Remove Defective Brim Liner	Measurement for payment of Cutting and Removing Defective Brims Liners will be based upon the quantity of defective brim liners requiring removal. Payment for cutting and removing defective brim liners will be made the unit prices, per number of identified in the Bid Schedule includes but is not limited to transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, cutting an brushing connection to the satisfaction of the PROJECT MANAGER, grouting of the area between the lateral and host pipe to ensure a watertight seal, all testing required to demonstrate a watertight seal has been obtained an pre and post closed circuit television survey. **(23) Cut and Remove Brim Liner EA**

Mechanical Root or Grease Removal	Measurement for payment for Mechanical Root or Grease Removal in excess of what is part of normal cleaning and TV work as specified in Section 02752 will be based upon the actual quantity of linear feet of lateral or mainline sewer cleaned as requested in writing by OWNER, as measured in the field. Payment for additional cleaning will be made at the unit price identified in the bid schedule, an includes but is not limited to mobilization and demobilization costs, cleaning, and all other effort required to perform the work in accordance with Section 02751 PREPARATORY CLEANING, ROOT AND TUBERCULATION REMOVAL **(24) Mechanical root or grease removal (lateral or mainline) (4" to 6") LF** **(25) Mechanical root or grease removal mainline (8" through 12") LF** **(26) Mechanical root or grease removal (14" to 18") LF** **(27) Mechanical root or grease removal (21" to 24") LF**
Mechanical Tuberculation Removal	Measurement for payment for Mechanical Tuberculation Removal will be based upon the actual quantity of linear feet of lateral or mainline sewer cleaned as requested in writing by OWNER, as measured in the field. Payment for additional cleaning will be made at the unit price identified in the bid schedule, an includes but is not limited to mobilization and demobilization costs, cleaning, and all other effort required to perform the work in accordance with Section 02751 PREPARATORY CLEANING, ROOT AND TUBERCULATION REMOVAL **(28) Mechanical tuberculation removal (lateral) (4" to 6") LF** **(29) Mechanical tuberculation removal mainline (under 12") LF** **(30) Mechanical tuberculation removal (12" to 15") LF** **(31) Mechanical tuberculation removal (18" to 24") LF**
Install Cured in-Place Sectional Sewer Main Liner	Measurement for payment of furnishing and Installing Sectional Sewer Main Liner will be based upon the actual quantity of sectionals installed up to eight (8) feet in length. Additional linear footage will be paid per linear foot. Payment for furnishing and installing liner will be made at the unit price, per linear foot of pipe identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the lining operation, CCTV and all other specified work in accordance with Section 02764 CURED-IN-PLACE SECTIONAL LINING. Additional linear footage beyond 8 feet shall be paid per linear foot. All footage and installation must be verified using CCTV. **Furnish and Install:** **(32) 6-inch x 4.5 mm mainline sectional (8-foot) EA** **(33) 6-inch x 4.5 mm mainline sectional (beyond 8-foot) LF** **(34) 8-inch x 6.0 mm mainline sectional (8- foot) EA** **(35) 8-inch x 6.0 mm mainline sectional (beyond 8-foot) LF** **(36) 10-inch x 6.0 mm mainline sectional (8-foot) EA** **(37) 10-inch x 6.0 mm mainline sectional (beyond 8-foot) LF** **(38) 12-inch x 6.0 mm mainline sectional (8-foot) EA** **(39) 12- inch x 6.0 mm mainline sectional (beyond 8-foot) LF** **(40) 15-inch x 7.5 mm mainline sectional (8-foot) EA** **(41) 15-inch x 7.5 mm mainline sectional (beyond 8-foot) LF** **(42) 18-inch x 9.0 mm mainline sectional (8-foot) EA** **(43) 18-inch x 9.0 mm mainline sectional (beyond 8-foot) LF** **(44) 21-inch x 9.0 mm mainline sectional (8-foot) EA** **(45) 21-inch x 9.0mm mainline sectional (beyond 8-foot) LF** **(46) 24-inch x 12.0 mm mainline sectional (8-foot) EA** **(47) 24-inch x 12.0 mm mainline sectional (beyond 8-foot) LF**

CIPP Lateral Lining	Measurement for payment of furnishing and Installing Lateral Liner will be based upon the actual number of sewer lateral lines installed up to 15 feet in length. Linear footage over 15 feet from the main line will be paid by linear foot for actual linear footage included. Payment for furnishing and installing liner will be made at the unit price, per lateral with full circle main connection and per linear foot in access of 15 feet of lateral pipe as identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the lining operation, CCTV and all other specified work in accordance with Section 02770 CURED-IN-PLACE LINING LATERALS **Furnish and Install:** **(48) 6 to 10- inch full circle main connection 4 to 6-inch x 4.5 mm lateral EA** **(49) 12-inch full circle main connection 4 or 6-inch x 4.5 mm lateral EA** **(50) 15- inch full circle main connection 4 or 6-inch x 4.5mm lateral EA** **(51) 18-inch full circle main connection 4 or 6-inch x 4.5mm lateral EA** **(52) 21 to 24-inch full circle main connection 4 or 6-inch x 4.5 lateral EA** **(53) Stack pipe, single lateral, 6 to 12-inch full circle main connection 4 or 6- inch X 4.5 mm lateral EA** **(54) Stack pipe, single lateral, 14 to 18-inch full circle main connection 4 or 6-inch X 4.5 mm lateral EA** **(55) Stack pipe, single lateral, 21 to 24-inch full circle main connection 4 or 6-inch X 4.5 mm lateral EA** **(56) Stack pipe, double lateral, 14 to 18- inch full circle main connection 4 or 6-inch X 4.5 mm lateral EA** **(57) Stack pipe, double lateral, 21 to 24-inche full circle main connection 4 or 6-inch X 4.5 mm lateral EA** **(58) Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet (all mainline sizes) LF** **(59) 6 to 12-inch full circle mainline to lateral connection for a drop connection, 6 to 10-inch x 4.5 mm drop pipe EA** **(60) 4 to 6-inch x 4.5 mm lateral liner from manhole up to 15' in length EA** **(61) Transitional Liner 4 to 6-inch x 4.5mm EA** **(62) 4 to 6-inch x 4.5 mm lateral liner from cleanout EA**
Sewer Lateral TV Inspection	Measurement for payment for TV inspection and locating of sewer laterals will be based upon the actual quantity of sewer laterals cleaned, inspected and located (up to 30 feet) via closed circuit television using a point and tilt camera as requested in writing by OWNER, as measured in the field. Payment for cleaning, TV inspection and locating of sewer laterals beyond 30-foot will be paid for on a linear footage basis for all distances up to the property line. Payment for cleaning and TV inspection will be made at the unit price identified in the Bid Schedule, includes but is not limited to mobilization and demobilization costs, cleaning, and all other effort required to perform the work in accordance with Section 02752 PIPE INSPECTION (Mains and Laterals). **(63) Lateral TV Inspection from sewer main up to 30 feet EA** **(64) Lateral TV Inspection from cleanout up to 30-foot EA** **(65) Lateral TV Inspection beyond 30-foot from the cleanout or the mainline access LF** **(66) Lateral locate for future cleanout install from inside of structure or vent stack EA**
Cleanout Installation	Measurement for payment of furnishing and Installing New Cleanouts will be based upon the quantity of cleanouts installed and restoration of all disturbed project areas in and around the project area. Payment for furnishings and installing cleanouts will be made at the unit prices, per number of identified in the Bid Schedule an includes but is not limited to transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all

	laboratory testing, field testing, excavation, restoration of property disturbed during the installation up to a full flag of concrete for installation in concrete areas, and all other specified work in accordance with CITY OF FORT LAUDERDALE CLEANOUT STANDARD DETAILS SSWR02. **Furnish and Install:** **(67) Cleanout installation in asphalt area depths up to 5-ft EA** **(68) Cleanout installation in concrete area depths up to 5-ft EA** **(69) Cleanout installation in grass area depths up to 5- ft EA** **(70) Cleanout installation in paver area depths up to 5-ft EA** **(71) Cleanout installation beyond 5-ft depth VF**
Minimally Invasive Sanitary Cleanout Installation	Measurement for payment for furnishing and Installing New Minimally Invasive Cleanouts will be based upon the quantity of cleanouts installed and restoration of all disturbed project areas in and around the project area. Payment for furnishings and installing minimally invasive cleanouts will be made at the unit prices, per number of identified in the Bid Schedule an includes but is not limited to transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, excavation, restoration of property disturbed during the installation up to a full flag of concrete for installation in concrete areas, and all other specified work in accordance with Section 02760 MINIMALLY INVASIVE SANITARY CLEANOUT **Furnish and Install:** **(72) Cleanout installation in asphalt area depths up to 5-ft EA** **(73) Cleanout installation in concrete area depths up to 5-ft EA** **(74) Cleanout installation in grass area depths up to 5- ft EA** **(75) Cleanout installation in paver area depths up to 5-ft EA** **(76) Cleanout installation beyond 5-ft depth VF**
Open Cut Excavated Point Repairs	Measurement for payment for Point Repairs will be based upon the actual quantity of point repairs performed. Payment for point repairs will be made of the unit price, per point repair identified in the Bid Schedule up to 15-foot of pipe length and includes but is not limited to all transportation costs, storing, excavation equipment and materials, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the port repair operation, and all other specified work in accordance with Section 02757 POINT REPAIR OF SANITARY SEWER. Linear footage of point repairs beyond 15 linear feet will be paid per linear foot at the price identified in the bid schedule. **(77) Point repair lateral 3 to 6- inch pipe, up to 6-foot depth EA** **(78) Point repair lateral 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth EA** **(79) Point repair lateral 3 to 6-inch pipe over 10-foot depth up to 12-foot depth EA** **(80) Point repair lateral 3 to 6-inch pipe over 12-foot depth up to 14-foot depth EA** **(81) Point repair main 8 to 10-inch pipe up to 6-foot depth EA** **(82) Point repair main 8 to 10-inch pipe, over 6-foot depth up to 8-foot depth EA** **(83) Point repair main 8 to 10-inch pipe, over 8-foot depth up to 10-foot depth EA**

	(84) Point repair main 8 to 10-inch pipe, over 10-foot depth up to 12-foot depth EA **(85) Point repair main 8 to 10-inch pipe, over 12-foot depth up to 15-foot depth EA** **(86) Point repair main 12 to 15-inch pipe, up to 6-foot depth EA** **(87) Point repair main 12 to 15-inch pipe, over 6-foot depth up to 8-foot depth EA** **(88) Point repair main 12 to 15-inch pipe, over 8-foot depth up to 10-foot depth EA** **(89) Point repair main 12 to 15-inch pipe over 10-foot depth up to 12-foot depth EA** **(90) Point repair main 12 to 15-inch pipe, over 12-foot depth up to 15-foot depth EA** **(91) Point repair main 18 to 24-inch pipe up to 6-foot depth EA** **(92) Point repair main 18 to 24-inch pipe, over 6-foot depth up to 8-foot depth EA** **(93) Point repair main 18 to 24-inch pipe, over 8-foot depth up to 10-foot depth EA** **(94) Point repair main 18 to 24-inch pipe, over 10-foot depth up to 12-foot depth EA** **(95) Point repair main 18 to 24-inch pipe, over 12-foot depth up to 15-foot depth EA** **(96) Point repair lateral beyond 15 feet, all diameters, depths up to 6 feet LF** **(97) Point repair main beyond 15-feet in length, all diameters, depths between 6 to 8 feet LF** **(98) Point repair main beyond 15-feet in length, all diameters, depths between 8 to 10 feet LF** **(99) Point repair main beyond 15 feet in length, all diameters, depths between 10 t0 12 feet LF** **(99A) Point repair main beyond 15 feet in length, all diameters, depths between 12 to 15 feet LF**
Polyethylene fused-on saddle	Measurement for payment for Polyethene Fused-on Saddles will be based upon actual quantity provided an install. Payment for Polyethylene fused on saddles will be made at the unit price identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the operation, main line tap and all other specified work in accordance with the section 02757 POINT REPAIR OF SANITARY SEWER **(100) Polyethylene fused-on saddle EA**
Realign, grout and seal manhole casting	Measurement for payment of Manholes Realigned, Grouted, and Sealed will be based upon the actual quantity performed. Payment will be made at the unit price, manhole identified in the bid schedule an includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed, and all other specified work in accordance with Section 02654 MANHOLE REHABILITATION CHIMNEY INTERNAL SEAL. **(101) Realign, grout and seal manhole casting (in street) EA**
Install manhole chimney seal	Measurement for payment of Manhole Chimneys Sealed will be based upon the actual quantity performed.

	Payment will be made at the unit price per manhole as identified in the bid schedule and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed, and all other specified work in accordance with Section 02654 MANHOLE REHABILITATION CHIMNEY INTERNAL SEAL. **(102) Install manhole chimney seal EA**
Replace watertight manhole frame and cover an install seal	Measurement for payment of Replacement of Watertight Manhole Frame and Cover an installation of associated seal will be based upon the actual quantity performed. Payment will be made at the unit price per manhole as identified in the Bid Schedule an includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed, and all other specified work as in accordance with Section 02656 MANHOLE REPAIRS. **(103) Replace manhole frame and cover and install seal EA**
Seal visible infiltration with AV-202 through manhole walls, bench and invert	Measurement for payment to Seal Visible Infiltration using AV-202 will be based upon the actual quantity of material used and verified by CITY representative. Payment will be made at the unit price per gallon as identified in the Bid Schedule and it includes but is not limited to all transportation cost, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed, and all other specified work in accordance with Section 02655 NON- STRUCTURAL MANHOLE LINING. **(104) Seal visible infiltration in Manhole (0-8 foot deep) GAL** **(105) Seal visible infiltration in Manhole (8-16 foot) GAL**
Repair manhole bench and invert	Measurement for payment to Repair Manhole Bench and Invert will be based upon the actual quantity of repairs performed. Payment will be made at the unit price per each manhole invert repaired. Payment of the unit price will provide compensation for cleaning injecting hydrophilic grout to stop active infiltration, if necessary; And patching the manhole bench and flow channels, isolation of the manhole by plugging entering lines, testing, labor, tools, and equipment and all incidentals and materials needed to restore the manhole bench and invert in accordance with Section 02656 MANHOLE REPAIRS **(106) Repair manhole bench and invert EA**
Replace manhole bench and invert	Measurement for payment to Replace the Manhole Bench and Invert will be based upon the actual quantity of replacements performed. Payment will be made at the unit price per each manhole invert replaced. Payment of the unit price will provide compensation for cleaning, injecting hydrophilic grout to stop active infiltration, if necessary; Furnishing labor, equipment, and all materials or combination of materials; And removing and reinstalling flow channel and benches; Isolation of the manhole by plugging entering lines; Testing, labor, tools and equipment; An all incidentals necessary to obtain a watertight, sealed manhole bench and invert in accordance with section 02656 MANHOLE REPAIRS. **(107) Replace manhole bench and invert EA**
Remove existing coating/liner	Measurement for payment to Remove Existing Coating or Liner will be paid based on the actual vertical foot of liner removed. Payment will be made at the unit price per vertical foot of manhole wall for removing the

	existing coating/ liner on manhole interior services. Measurement will be made from the bottom of the liner, at its lowest point to the bottom of the frame. Payment of the unit price shall include all necessary cleaning, abrasive blasting and preparation of the interior manhole surface; Furnishing and supplying of all materials or combination of materials to remove existing coating/ liner, temporary blocking or plugging incoming lines; Removal, transportation and disposal of material generated by cleaning and preparation activities; Television surveys before and after installation; Testing; Clean up, all labor, materials equipment and all incidentals required to provide a complete and acceptable manhole ready to be sealed an lined as required. **(108) Remove existing coating/liner VF**
Provide and install manhole coating/ liner	Measurement for payment to Provide and Install Manhole Coating/ Liner will be based on the actual vertical feet of the coding/ liner installed. Payment will be made at the unit price per vertical foot of manhole wall for installation of spray- applied coating/ liner on manhole interior surfaces. Measurement will be made from the bench, at its highest point, to the bottom of the frame. Payment of the unit price per vertical foot shall include all necessary cleaning, abrasive blasting, preparation of the interior manhole surfaces, drying of manhole surfaces, MOT, furnishing an supplying of all the materials or combination of materials making up the spray- applied coating/ liner; Temporary blocking or plugging incoming lines; removal transportation and disposal of materials generated by cleaning and preparation activities; Television surveys before and after installation, testing; Clean up; All labor, materials, equipment and all incidentals required to provide a complete and acceptable installation in accordance with Section 02656 MANHOLE REPAIRS, Section 02958 STRUCTURAL MANHOLE LINING, 02958-01 IET CODING SYSTEM, AND OR 02958-02 RAVEN CODING SYSTEM. **(109) Provide and Install manhole coating/liner VF**
Line bench, invert, and wall up to 4 vertical feet	Measurement for payment to provide an Install Manhole Coating/ Liner will be based on the actual number of manhole benches, inverts, and partial walls lined. Payment will be made at the unit price per unit of manhole benches, inverts and walls up to 4 foot for removal of up to 4 foot of existing liner for purposes of trying gnu liner into the existing liar and installation of the spray- applied coding/ liner on manhole interior surfaces. Measurement will be made from the bench, at its highest point, to the bottom of the existing liner to remain. Payment of the unit price per unit shall include all necessary removing of existing liner up to four feet from the bench, cleaning, abrasive blasting, preparation of the interior manhole surface is, drying of manhole surface is, MOT, furnishing and supplying of all materials or combination of materials making up the spray- applied coding/ liner; Temporary blocking or plugging incoming lines; Removal, transportation, and disposal of material generated by cleaning and preparation activities; Television surveys before and after installation, testing; Clean up; All labor, materials, equipment and all the incidentals required to provide a complete an acceptable lining of the manhole bench, invert a wall sufficient to install the new liner and make a watertight connection to the existing liner in accordance with Section 02958 MANHOLE REPAIRS, 02958- 01 IET CODING SYSTEM, AND OR 0295802 RAVEN COATING SYSTEM. **(110) Line bench, invert and wall up to 4 feet EA**
Site restoration	Measurement for payment for Site Restoration will be based on the actual cost of restoration incurred outside of the limits of other pay items at the request of the OWNER per unit specified in the Bid Package. These restoration items shall be paid for items not included in other pay items. This restoration will only apply to items requested by the OWNER for additional work outside what's specified in individual pay items. Payment shall include all labor, materials, storage installation and incidentals as specified in technical specification Section 02575, SURFACE RESTORATION

	(111) Asphalt Roadway Replacement SY **(112) Asphalt Pavement Overlay (1" thickness) SY** **(113) Asphalt Driveway Replacement SY** **(114) Concrete Replacement (4" or 6" thickness) SY** **(115) Concrete Curb and Gutter Replacement LF** **(116) Sod Replacement SF** **(117) Remove and Replace Brick Pavers SF**
Dye Test Laterals	Measurement for payment of Dye Testing will be based on the actual number of dye tests performed. Dye testing shall be paid per lateral tested and includes but is not limited to contacting tenant or property owner, obtaining access to the interior or exterior of the property as required to test the sewer lateral connection, providing material data regarding chemicals used to the homeowner, providing all materials, labor, television survey required to verify if a sewer lateral provides an active connection between a property and the sewer main line, and providing a report to the CITY. All dye utilized must be non-staining, free of odors, designed for the purpose of sewer dye testing, and non-toxic. Material data safety sheets must be provided to the city for approval and must be available for the inspection of each property OWNER or tenant. **(118) Dye testing EA**
Replacement of Existing Double Wye	Measurement for payment of double wye replacement will be based upon the actual quantity of replacements performed. Payment for Double Wye replacement will be made at the unit price, per replacement identified in the bid schedule an includes but is not limited to all SDR 35 PVC pipes, fittings in cleanouts per CITY OF FORT LAUDERDALE standard details required for a new installation and all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the Double Wye replacement operation, and all other specified work in accordance with Section 02758 SANITARY SEWER DOUBLE WYE SERVICE CONNECTION AND 02632 STORM DRAIN AND SANITARY SEWER PIPING. **(119) Double Service connection replacement 3 to 6-inch pipe, up to 6-foot depth EA** **(120) Double service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth EA**
Install New Standard Precast Concrete Sewer Manhole	Payment shall be made at the unit price bid, per manhole installed, provided in the Bid Proposal, and shall include full compensation for all labor, materials, equipment, restoration and incidentals required to install the new sewer manhole. New precast concrete sanitary sewer manholes shall conform to the current version of the City of Fort Lauderdale Standard Details. **(121) Install new standard precast concrete 48- inch diameter sewer manhole (up to 4 foot in depth) EA** **(122) Install new standard precast concrete 48- inch diameter sewer manhole (4 to 6 feet in depth) EA** **(123) Install new standard precast concrete 48- inch diameter sewer manhole (6 to 8 feet in depth) EA** **(124) Install new standard precast concrete 48- inch diameter sewer manhole (8 to 10 feet in depth) EA** **(125) Install new standard precast concrete 48- inch diameter sewer manhole 10 to 12 feet in depth) EA** **(126) Install new standard precast concrete 48- inch diameter sewer manhole (12 to 16ft. in depth)** **EA**

Expedited Mobilization	Payment shall be made at the unit price bid, per mobilization performed provided in the Bid Proposal and shall include full compensation for all additional labor, materials, equipment and incidentals required to complete an expedited mobilization, if so requested by the CITY, in association with any other work under this contract. Payment shall be per mobilization performed, where CONTRACTOR shall mobilize an actively initiate the work within 24 hours of the CITY's request. The CONTRACTOR is not required to accomplish an expedited mobilization but cannot otherwise earn the associated payment. **(127) Expediated Mobilization EA**
Install Plug for Pipe Abandonment	Payment shall be made for the unit price bid, per plug installed, provided in the bid proposal and shall include full compensation for all labor, materials, equipment, property re inspection work, and incidentals required to install the plug. Plug installations shall consist of a mechanical plug ("Iron Grip" by Cherne Industries, Inc. or approved equal) followed by a non- shrink, cement- based grow placed up to the mechanical plug an over the pipe opening to ensure a waterproof plug. **(128) Install 4-inch plug for pipe abandonment in pipe of 4-inches in diameter EA** **(129) Install 6-inch plug for pipe abandonment in pipe of 6-inches in diameter EA** **(130) Install 8-inch plug for pipe abandonment in pipe of 8-inches in diameter EA** **(131) Install 10-inch plug for pipe abandonment in pipe of 10-inches in diameter EA** **(132) install 12-inch plug for pipe abandonment in pipe of 12-inches in diameter EA**
Excavate and Replace Stack Lateral	Payment shall be at the unit price bid, per stack replacement performed, provided in the Bid Proposal an includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, laboratory testing, field testing, restoration of property and services disturbed during the operation, and incidentals required to complete a stack lateral replacement per stack lateral pay items with units of EA include up to 15 feet of six-inch pipe and fittings consisting of the LMK Technologies saddle (or approved equal) to attach the stack lateral to the lined gravity main (all diameters), single or double Y as applicable, and other fittings as required. Linear footage of six- inch pipe and fittings beyond 15 linear feet will be paid per linear foot at the price identified in the bid schedule. New stack laterals shall conform to the current versions of the City of Fort Lauderdale Standard Details. Cleanout installation, where directed, shall begin an end with an open trench and all associated excavation backfill, restoration, and other related costs shall be compensated under the lateral replacement pay items. **(133) Excavate and replace stack lateral (up to 6 feet in depth) EA** **(134) Excavate and replace stack lateral (6 to 8 feet in depth) EA** **(135) Excavate and replace stacked lateral (8 to 10 feet in depth) EA** **(136) Excavate and replace stack lateral (10 to 12 feet in depth) EA** **(137) Excavate and replace lateral (beyond 15 linear feet) LF** **(138) Install 6-inch Cleanout, open trench EA**
Install Cured-in-Place Cap-a Connection Liner	Measurement for payment of furnishing and installing a short cured-in-place liner to cap and seal abandoned service connections will be based upon the actual quantity of Cap-A-Connection liners installed up to two (2) feet in length. Payment for furnishing and installing Cap-A- Connection liner will be made at the unit price

	identified in the Bid Schedule and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the liner operation, CCTV and all other specified work in accordance with Section 02771 CURED-IN-PLACE CAP-A-CONNECTION LINING. Placement of the sealed cap connection must be verified using CCTV. **Furnish and Install:** **(139) 8-inch Cap-A-Connection liner x 3.0 mm EA** **(140) 10-inch Cap-A-Connection liner x 4.5 mm EA** **(141) 12-inch Cap-A-Connection liner x 4.5 mm EA** **(142) 15-inch Cap-A-Connection liner x 6.0 mm EA** **(143) 18-inch Cap-A-Connection liner x 6.0 mm EA** **(144) 21-inch Cap-A-Connection liner x 6.0 mm EA** **(145) 24-inch Cap-A-Connection liner x 9.0 mm EA**
Traffic Control/ MOT	Payment for Traffic Control/ Maintenance of Traffic (MOT) will include all equipment, materials, labor, agency coordination, permitting and all costs associated with maintaining all traffic flow including vehicular and pedestrian traffic. Traffic Control/MOT is subject to specification Sections 01025(1.5B) and 01500 and 01500-02 MOT Form Guidelines - Supplemental 2 **(146) Traffic Control/ MOT (LS)**
Bypass Pumping	Measurement for payment for bypass pumping will be paid at a unit price for various pipe sizes as outlined in the bid tabulation sheet. This item shall provide for bypass pumping operations required for sewer and manhole repair work. The CONTRACTOR shall attempt to perform the sewer work without bypass pumping; However, if bypass pumping is necessary, it will be paid at the ALLOWANCE price identified as a payment. This item shall include, but not limited to, all necessary required, pumps, piping, gasoline/ diesel fuel, maintenance, transportation and storage, temporary bypass and service piping, labor, materials, and or any other costs associated with bypass pumping. Plugging or blocking sewer lines shall be included in the appropriate bid item for which flow must be stopped and shall be considered incidental work and no additional payment shall be considered. Bypass pumping shall conform to Sections 01025(1.5B) and 02750 WASTEWATER FLOW CONTROL **(147) Bypass Pumping AL**
Dewatering	Payment for dewatering will include all equipment, materials, labor, agency coordination, permitting and all work activities and costs associated with dewatering during excavation. Dewatering shall confirm to Sections 01025(1.5B) and 02240 DEWATERING **(148) Dewatering AL**
Owner's Contingency	Payment for this item is reserved for any site-specific work that is required but not included in any other pay item(s) of the Contract. It can only be created and authorized with approval from the CITY's PROJECT MANAGER and ratified by PROCUREMENT STAFF. Time and materials costs quantities must be developed and agreed upon by the CITY's PROJECT MANAGER and Contractor prior to approval. All work must be inspected and accepted by the CITY's PROJECT MANAGER upon completion of the work. CITY reserves the right to augment Discretionary Allowance initial amount at any time and through the request of the CITY'S PROJECT MANAGER and as ratified by PROCUREMENT STAFF. **(149) Owner's contingency AL**
Asphalt Roadway	Payment for this item includes furnishing all materials, labor, and equipment to construct asphalt roadway. This item includes base, sub-base, density test, and all incidentals for a complete asphalt roadway construction. **(150) Asphalt Roadway SY**

Asphalt Resurfacing	Payment for this item includes furnishing all materials, labor, and equipment to construct asphaltic pavement resurfacing. This item includes construction of 1-inch-thick asphaltic concrete resurfacing, using FDOT Type III asphaltic concrete. **(151) Asphalt Resurfacing** **SY**
Asphalt Driveway Replacement to Match Existing	Payment for this item includes furnishing all materials, labor, and equipment to construct asphalt driveway to match existing. This item includes base, milling, density testing, and all incidentals for a complete asphalt driveway replacement. **(152) Asphalt driveway replacement to match existing** **SY**
Concrete Sidewalk	Payment for this item includes furnishing all materials, labor, and equipment to construct 6-inch-thick concrete sidewalk. This item includes detectable warning texture, compaction, and all incidentals for a complete construction of concrete sidewalk. **(153) Concrete Sidewalk** **SY**
Sod Installation	Payment for this item includes furnishing all materials, labor, and equipment to replace disturbed sod. This item includes grading, installation of clean sand fill, 2-inch-thick topsoil, and sod to match existing. If there is none existing sod, contractor shall install Bahia Sod. **(154) Sod installation** **SF**
Landscape Restoration	Payment for this item includes furnishing all materials, labor, and equipment to replace disturbed landscape. This item includes grading, installation of clean sand fill, 2-inch-thick topsoil, and landscape material to match existing or better. **(155) Landscape restoration** **AL**
Mobilization and Demobilization (Sum of mobilization and demobilization shall not exceed 3% of the Total Bid amount).	Payment for the full compensation for all mobilization/demobilization activities, including but not limited to transport personnel, material, equipment, and other incidentals to the site, all notifications to public including but no limited to flyers and other notifications, preparation of submittals including schedule, permit packages, and others, temporary facilities and offices, safety equipment and first aid supplies, project sings meeting City standards, field surveys, sanitary and other facilities required by the specifications, audio-video documentation of the existing site, any space required for staging, laydown, survey, storage, parking, security, project meetings, preparation of the project record documents as specified in the technical specifications, etc., and all other pre- or post-construction expenses necessary for the start or cessation of the work. Partial payments for mobilization will be made as follows: Construction % completed — Allowable % of Lump Sum 5 — 25 10 — 50 25 — 75 100 — 100 **(156) Mobilization and Demobilization** **LS**
	(157) Do not used
Permitting Reimbursement	This item is for payment for any permit required by the jurisdictions where the job is taking place. Contractor is responsible for securing all permits with all municipalities, government agencies, City of Fort Lauderdale, Broward County, and any other agency as required for the execution of this work. **(158) Permits** **AL**
Lined Main Tap Saddle	Measurement for payment for lined main tap saddles will be based upon the actual quantity provided and installed. Payment will be made at the unit price identified in the Bid Form and includes but is not limited to all transportation costs, storing, mobilization and demobilization costs, furnishing and installing all necessary components, all laboratory testing, field testing, restoration of property disturbed during the operation, mainline tap and all other specified work to install a lined main tap saddle (LMT Saddle by LMK or approved equal).

	Lined main tap saddle installation, where directed, shall begin and end with an open trench and all associated excavation, restoration, and other related costs shall be compensated under the lateral replacement pay items. **(159) Install lined main tap saddle open trench EA**
Remove Existing Sectional Liner	Measurement for payment of cutting and removing sectional liners will be based upon the quantity remove. Payment of the unit price per each will provide complete compensation for all required work including, but not limited to, furnishing materials and all labor, tool, equipment, and incidentals to cut and remove the sectional liner to the satisfaction of the OWNER; and providing pre-and post-removal video documentation. **(160) Remove 8" Mainline Sectional Liner EA** **(161) Remove 10" Mainline Sectional Liner EA**
Exploratory Excavation	This item shall include vacuum excavation services for locating utilities 0-5 feet below land surface, including excavation, asphalt/concrete removal and disposal, backfill, compaction, surface restoration, primary locating services and appurtenances. Payment will be made at the contract unit cost for each pothole including survey. For exploratory excavations greater than 5 feet in depth, payment will be made at the contract unit cost for each vertical foot below 5 feet excavated. This item shall be paid in addition to the contract unit cost for the first 5 feet of depth. **(162) Exploratory excavation EA** **(163) Exploratory excavation VF**
Install Cured-in Place Sectional Liner to Seal Existing Service Connection	This item will be measured and paid at the unit price per each cured-in-place sectional pipe liner installed, as delineated by the pipe diameters named in the Bid Form. Each unit price bid shall provide full compensation for all work, including, but not limited to pipe cleaning; furnishing and installing all necessary components; television inspections; restoration of property disturbed during the lining operation; and all labor, materials and equipment specified or not which will provide a complete and acceptable liner installation to effectively abandon the service and provide a watertight seal. The service connection seal shall include a disc-shaped hydrophilic gasket designed to cover and provide a watertight seal over the service pipe opening at the main connection (Cap-a-Connection by LMK Enterprises or approved equal). The materials and installation practices shall adhere to the structural and chemical resistance requirements described in ASTM F 1216. **(164) 8" main EA** **(165) 10" main EA** **(166) 12" main EA** **(167) 15" main EA** **(168) 18" main EA**
Remove Existing Liner	Measurement for payment of cutting and removing liners will be based upon the LF removed. Payment of the unit price per each will provide complete compensation for all required work including, but not limited to, furnishing materials and all labor, tools, equipment and incidentals to cut and remove the liner to the satisfaction of the OWNER, and providing pre- and post-removal video documentation. **(169) Remove existing mainline liner LF** **(170) Remove existing lateral liner LF**

1.6 NON-PAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for the following:

1. Excess quantities determined by the ENGINEER not to be required for installation under the Contract.
2. Loading, hauling and disposing of rejected material.
3. Quantities of material wasted or disposed of in manner are not called for under Contract Documents.
4. Rejected loads of material, including material rejected after it has been placed by reason of failure of the CONTRACTOR to conform to provisions of Contract Documents.
5. Material not unloaded from transporting vehicle.
6. Defective work not accepted by OWNER.
7. Material remaining on hand after completion of work.

1.7 PARTIAL PAYMENT FOR STORED MATERIALS AND EQUIPMENT

A. Partial Payment: No partial payments will be made for materials and equipment delivered or stored unless agreed to by the OWNER and the ENGINEER.

B. Final Payment: Will be made only for products incorporated in work. Remaining products, for which partial payments have been made, shall revert to the CONTRACTOR unless otherwise agreed, and partial payments made for those items will be deducted from final payment.

1.8 ALLOWANCES

A. The allowances shall be used only at the discretion of and as ordered by the OWNER for such items as unforeseen conditions, unforeseeable conflicts between existing elements of work and their proposed work, unit price items exceeding estimated quantities, and any associated work requested by the OWNER including all labor, materials, and services for modifications or extra work to complete the project as was anticipated, but not specifically included in this contract.

B. Any portion of these allowances that remain after all authorized payments have been made will be withheld from contract payments and will remain with the OWNER.

PART 2 PRODUCTS (NOT USED)
PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01040
COORDINATION

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational:

1. Statement of Qualification (SOQ) for land surveyor or civil ENGINEER.

2. Statement of Qualification (SOQ) for professional videographer.

3. Photographs:

a. Color Prints: submit 2 copies, accompanied by negatives or digital files, within five days of being taken.
b. Video Recordings: submit 2 copies within five days of being taken.

1.2 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the work with various utilities within project limits. Notify applicable utilities prior to commencing work.
1. Contact the City of Fort Lauderdale Public Services Department at 954-828-8000 for water, storm and sewer utility locations.

2. Contact Sunshine State One Call at 1-800-432-4770 at least two (2) business days prior to any excavation.

B. If damage occurs, or conflicts or emergencies arise during work, contact the appropriate utility.
1. Electric company: Florida Power and Light.
a. Contact person: trouble center (or police/fire- 911)
b. Telephone 954-797-5000

2. Telephone company: BellSouth
a. Contact person: Jason Boschen
b. Telephone 954-316-4005 or 954-605-1121

3. Water and Sewer Department: Fort Lauderdale Public Services Department.

a. Contact person: Emergency hotline
b. Telephone 954-828-8000

4. Gas Company: TECO Peoples Gas

a. Contact person: Dispatch
b. 305-957-3857 ext. 7490 or 877-832-6747

5. Telecom: AT&T- Broadband/ Comcast

a. Contact: Andy Vaspasiano
b. Telephone: 954-266-6589 or 954-444-2833

6. Telecom: FPL Fiber Net

a. Contact: Noel R. Reese
b. Telephone: 305-552-3249 or 305-205-1283

7. Broward County Traffic Engineering Division (For Traffic Signal Communications Systems Underground Cable):

    a. Contact: Keith Smith
    b. Telephone: 954-484-9600, Ext 227
    c.

1.3 PROJECT MEETINGS

A. General

1. ENGINEER: schedule physical arrangements for meetings throughout progress of work, prepare meeting agenda with the PROJECT MANAGERS, OWNERS and CONTRACTORS input and distribute with written notice of each meeting preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies of minutes after each meeting to participants and parties affected by the meeting decisions.

2. Representatives of the PROJECT MANAGER's, OWNER's, CONTRACTOR'S, and SUBCONTRACTORS shall attend meetings every two (2) weeks or as necessary as determined by the OWNER.

B. Preconstruction Conference:

1. CONTRACTOR shall be prepared to discuss the following subjects, as a minimum:

    a. Required schedules.
    b. Status of bonds and insurance.
    c. Sequence of critical path work items.
    d. Project changes and clarification procedures.
    e. Use of site, access, office and storage areas, security and temporary facilities.
    f. Major project delivery and priorities.
    g. CONTRACTOR's safety plan and representative.
    h. Progress payment procedures.

2. Attendees may include but not limited to:

    a. OWNER's representatives.
    b. PROJECT MANAGER's representatives.
    c. CONTRACTOR's office representative.
    d. CONTRACTOR's resident superintendent.
    e. CONTRACTOR's quality control representative.
    f. SUBCONTRACTORS representatives whom CONTRACTOR may desire, or PROJECT MANAGER may request to attend.
    g. ENGINEER's representatives.

h. Others as appropriate.

C. Preliminary Schedules Acceptability Review Meeting: as required to review and finalize preliminary schedule.

D. Progress Meeting:

1. PROJECT MANAGER will schedule regular progress meetings, conducted biweekly to review work progress, progress schedule, shop drawing and sample submission schedule, application for payment, contract modifications, and other matters needing discussion and resolution.

2. Attendees will include:

a. OWNER's representatives, as appropriate.

b. PROJECT MANAGER, as appropriate.

c. CONTRACTOR, SUBCONTRACTORS, and suppliers, as appropriate.

d. ENGINEER'S representative(s).

e. Others as appropriate.

3. On a monthly basis, the PROJECT MANAGER will conduct a meeting to review work completed from previous month versus the progress schedule, work planned for upcoming month based on the progress schedule, the monthly application for payment, and any outstanding issues related to performance of the work including pending contract modifications, requests for clarification, shop drawings, etc. All parties will attend the monthly meeting.

E. Pre-Installation Meetings:

1. When required in individual specification sections or as necessary to coordinate the work, convene at site prior to commencing work of that section.

2. Require attendance of entities directly affecting, or affected by, work of that section.

3. Notify PROJECT MANAGER four (4) days in advance of meeting date.

4. Provide suggested agenda to PROJECT MANAGER to include reviewing conditions of installation, preparation and installation or application procedures, and coordination with related work and work of others.

F. Other Meetings: In accordance with the Contract Documents and as may be required by the OWNER, PROJECT MANAGER and ENGINEER.

1.4 FACILITY OPERATIONS

A. Continuous operation of OWNERS facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.

B. Perform work continuously during critical connections and changeovers, and as required to prevent interruption of OWNER's operations.

C. When necessary, plan, design, and provide various temporary services, utilities, connections,

temporary piping, access and similar items to maintain continuous operations of OWNER's facilities.

D. Do not close lines, open or closed valves, or take other action which would affect the operation of existing systems, except as specifically required by the contract documents and after authorization by OWNER an ENGINEER such authorization will be considered within 48 hours after receipt of CONTRACTORs written request.

E. Provide seven (7) days advance written notice for approval of need to shut down a process or facility to OWNER and PROJECT MANAGER.

F. Power outages will be considered upon 48 hours written requests to the OWNER and the PROJECT MANAGER. Describe the reason, anticipated length of time, and areas affected by the outage. Provide temporary provisions for continuous power supply to critical facility components.

G. Do not proceed with work affecting a facilities operation without obtaining the OWNERS and PROJECT MANAGERS advance approval of the need for the duration of such work.

H. Relocation of Existing Facilities:

1. During construction, it is expected that minor relocations of work will be necessary.

2. Provide complete relocation of existing structures in Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, and other necessary items.

3. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.

4. Perform relocations to minimize downtime of existing facilities.

5. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by PROJECT MANAGER.

1.5 BYPASS PUMPING

A. Where the work includes connections or modifications to existing sanitary sewer systems, wastewater flows shall be controlled through the pipeline section where work is being performed. Under no circumstances, can portions of the system be removed from the service for periods of time in excess of that approved by the OWNER. The CONTRACTOR shall be responsible to assess conditions and capacities of the existing sewer line in order to implement an acceptable bypass plan at no additional cost to the OWNER. The CONTRACTOR shall supply the necessary pumps, conduits, and other equipment to not only divert flow around the pump station, manhole, or pipe section in which work is to be performed, but also to transmit the flow in downstream sewer lines and or pump stations without surcharge. The bypass systems shall be of sufficient capacity to handle existing flows plus additional peak flows that may occur during periods of high tide or rainfall. Emergency backup pumping capability must be available in addition to the primary bypass system. The CONTRACTOR will be responsible for furnishing the necessary labor, power, and supervision to set up and operate the pumping and bypass systems. When pumping is in operation, all engines shall be equipped in a manner to keep the pump noise to a minimum and to comply with applicable noise ordinances.

B. CONTRACTOR shall be responsible for any damage to properties or buildings connected to the sewer system, and to the pipeline, which result from the flow control activities.

C. CONTRACTOR shall submit a bypass pumping plan for all proposed bypass pumping operations.

1.6 PHYSICAL CONDITIONS

A. Exercise reasonable care to verify locations of existing subsurface structures and Underground Facilities.

B. Thoroughly check immediate and adjacent areas subject to excavation by visual examination (and by electronic metal and pipe detection equipment, as necessary) for indications of subsurface structures and Underground Facilities.

C. Make exploratory excavations where existing underground facilities or structures may potentially conflict with proposed underground facilities or structures. Conduct exploratory excavations in presence of the ENGINEER and sufficiently ahead of construction to avoid possible delays to the CONTRACTOR's work.

1.7 ADJACENT FACILITIES AND PROPERTIES

A. Examination:

1. After effective date of the agreement and before work at the site is started, the CONTRACTOR, PROJECT MANAGER, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of work, as applicable which could be damaged by construction operations.

2. Periodic re-examination shall be jointly performed to include, but not limited to, cracks in the structures, settlement, leakage, and similar conditions.

B. Documentation:

1. Record and submit documentation of observations made on examination inspections in accordance with paragraphs construction paragraphs and audio-video recordings.

2. Upon receipt, ENGINEER will review, sign and return one record copy of documentation to CONTRACTOR to be kept on file in field office.

3. Such documentation shall be used as indisputable evidence of ascertaining whether and to what extent damage occurred because of the CONTRACTOR's operations, and is for the protection of adjacent property owner, CONTRACTOR, and OWNER.

1.8 CONSTRUCTION PHOTOGRAPHS

A. Photographically document all unique portions of the construction including tie-ins to existing pipelines or facilities, crossing of existing utilities, buried valve piping intersections, in other work items that will not otherwise be visible after completion of construction.

B. Film or file handling and development shall be done by a commercial laboratory.

C. The PROJECT MANAGER and ENGINEER shall have the right to select the subject matter and vantage point from which photographs are to be taken.

D. Construction Progress Photos:

1. Photographically demonstrate progress of construction, showing every aspect of site and adjacent properties as well as interior and exterior of knew or impacted

structures.

2. Monthly: take 24 exposures using color digital photographs of high-resolution quality, unless otherwise approved by the OWNER or ENGINEER. Submit all JPG picture files to PROJECT MANAGER.

E. Color Prints:

1. Minimum size: 3-inch by 5-inch.
2. Finish: Glossy
3. Label each print:
   a. Project Name
   b. Date and time photo was taken.
   c. Photographer's name.
   d. Caption (Maximum of 30 characters)
   e. Location and area designation.
   f. Schedule activity number, as appropriate.
4. Assemble inbound albums in clear plastic sleeves that facilitate viewing both front and back of each photograph.
5. assemble negatives in their corresponding album in clear plastic sleeves made for the purpose or on recordable CD media organized by project segment.

1.9 AUDIO-VIDEO RECORDINGS

A. Prior to beginning work on construction site or a particular area of the work, and again within 10 days following the date of substantial completion, video graph construction site and property adjacent to construction site for work requiring excavation. For trenchless installation, videographer shall be completed prior to installation an again within 10 days of installation and submit it to the PROJECT MANAGER no later than 10 days after installation in accordance with section 02752 PIPE INSPECTION (MAINS AND LATERALS).

B. In the case of preconstruction recording, no work shall begin in the area prior to the PROJECT MANAGERS review and approval of content and quality of video for that area.

C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within pipeline alignment and the areas adjacent to and within the Right-of-way or easement comma and on the CONTRACTOR storage and staging areas.

D. The PROJECT MANAGER an ENGINEER shall have the right to select subject matter and vantage point from which videos are to be taken.

E. Video recording shall be by a professional commercial videographer, experienced in shooting construction videos.

F. Video Format and quality:

1. Digital format, with sound.
2. Video:
   a. Produce bright, sharp, and clear images with accurate colors, free of distortion

and other forms of picture imperfections.

b. Electronically and accurately display the month, date, year and time of day of the recording.

3. Audio:

a. Audio documentation shall be done clearly, precisely, and at a moderate pace.

b. Indicate date, project name, and a brief description of the location of taping, including:

1. Facility name.
2. Street names or easements.
3. addresses of private property; And
4. Direction of coverage, including engineering stationing, if applicable.

G. Documentation:

1. Provide two copies to the OWNER.
2. File and label:

a. File number (numbered in accordance with OWNER's sewer designation as indicated in Section 02752 PIPE INSPECTION (MAINS AND LATERALS)

b. Project Name.

c. Name of address, street(s) or easement(s) included.

d. Applicable location by sewer designation and address.

e. Date and time of coverage.

3. Project Video Log: maintain an ongoing long that incorporates above noted label information for video submittals on project.

H. The following shall be included with the Video Documentation:

1. Coverage is required within and adjacent to the rights of way, easements, storage, and staging areas where the work is being constructed.

2. Documentation of the conditions of the adjacent properties or any affected structures as a result of the impending construction.

3. Certification as to date work done and by whom.

4. all videos shall be keyed to the construction drawings, provided with an index of a written narrative.

I. Preconstruction and Postconstruction videos shall be submitted as follows:

1. Preconstruction videos shall be presented to the OWNER at the Preconstruction Conference.
2. Post construction videos shall be submitted no later than ten (10) days after the lining work is completed for the applicable pipe segment. This submittal is contingent to

payment.

J. Payment for the work in this section is included incidental to the project work and will not be a separate pay item.

1.10 REFERENCE POINTS, SURVEYS, AND RECORD DRAWINGS

A. Location and elevation of benchmarks are shown on drawings.

B. CONTRACTOR's responsibilities:

1. Additional survey and layout required to layout the work.

2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections there too.

3. In event of discrepancy in data or benchmarks, request clarification before proceeding with work.

4. Retain professional land surveyor or civil ENGINEER registered in state of Florida who shall perform or supervise engineering surveying necessary for additional construction staking and layout in obtaining record information for as built and record drawing preparation.

5. Maintain complete accurate log of survey work as it progresses is as a record document. The CONTRACTOR is responsible for the quality control of horizontal location and vertical elevations of the installed project.

6. On request of PROJECT MANAGER, submit documentation.

7. Provide competent employee(s), tools, stakes, and other equipment and materials as PROJECT MANAGER may be required to:

a. Establish control points, lines an easement boundary.
b. Check layout, survey and measurement of work performed by others.
c. Measure quantities for payment purposes.

8. CONTRACTOR(s) to refer to Technical Memorandum 2: Document Control for As-built Drawings and Survey Files; document included in the Attachments section of the specifications.

1.11 AS BUILTS AND ASSETS DATA

1. The CONTRACTOR shall provide as built and data for all assets the CONTRACTOR works on in a fashion that it is compatible with the City Asset Management System "CityWorks". Delivery methods shall include desk top viewing and database import with minimal asset manipulation. Contractor shall package the data in WINCAM Vx software or later software version. Contractor is responsible to ensure the data generated by them is concordant with CITYWORKS asset management system. Any changes incurred by the contractor due to lack of coordination or preparation by the contractor, shall be corrected by the contractor at no cost to the City.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 CUTTING, FITTING AND PATCHING

A. Cut, fit, adjust, or patchwork and work of others, including excavation and backfills as required, to make work complete.

B. Obtain prior written authorization of ENGINEER before commencing work to cut or otherwise alter:

1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.

2. Weather, or moisture resistant elements.

3. Efficiency, maintenance, or safety of element.

4. Work of others.

C. Refinish surfaces to provide an even finish.

1. Refinish continuous services to nearest intersection.

2. Refinish entire assemblies.

3. Finish restored services to such planes, shapes, and textures that no transition between existing work and work is evident in finished services.

D. Restore existing work, Underground Facilities, and surfaces that are to remain incomplete work including concrete-embedded piping, conduit and other utilities as specified and as shown.

E. Make restorations with new materials an appropriate method of specified for new work of similar nature; If not specified, use recommended practice of manufacture or appropriate trade association.

F. Fit work airtight to pipes, sleeves, ducks, conduit and other penetrations through surfaces and fill voids.

G. Remove specimens of installed work for testing when requested by PROJECT MANAGER or ENGINEER.

END OF SECTION

SECTION 01300
SUBMITTALS

PART 1 GENERAL

1.1 DEFINITIONS

A. Action Submittal: Written and graphic information submitted by the CONTRACTOR, that requires ENGINEER's approval.

B. Informational Submittal: Information submitted by the CONTRACTOR, that does not require the PROJECT MANAGERS approval. Submittals not meeting conditions of the contract will be returned.

1.2 DOCUMENT CONTROL SYSTEM

A. The CONTRACTOR shall provide document control submittal summaries as part of regular submittals to document such information provided to the City.

B. The CONTRACTOR shall track and categorize submittals including submittal dates, revision numbers, and changes.

C. The CONTRACTOR shall retain on file the original copies of scanned documents submitted through the warranty period of the project. The original copy shall be made available to the PROJECT MANAGER upon request.

D. All submittals shall be labeled with project number, task order number, basin number, and PROJECT MANAGER at a minimum.

1.3 PROCEDURES

A. The CONTRACTOR shall prepare and submit select construction related correspondence, (transmittal, RFI'S, proposals, etc.) to the PROJECT MANAGER via e-mail. During the preconstruction meetings and the CONTRACTOR shall be instructed by the City of Fort Lauderdale Project Construction Manager on the details for submitting correspondence for this contract.

B. Submittals containing material samples, or which require original shall be directed to the PROJECT MANAGER at the following address, unless specified otherwise.

1. City of Fort Lauderdale, 100 N. Andrews, 4th Floor, Fort Lauderdale, FL 33301.

C. Transmittals of video and photographs shall be transmitted via a single large capacity external hard drive for all pre rehabilitation videos. Post rehabilitation videos shall be submitted via thumb drive within ten (10) days of completion of rehabilitation work period thumb drives must be labeled with basin number, task order number, and date in order to be accepted.

D. Transmittal of Submittal:

1. The CONTRACTOR shall:
   a. Review each submittal with uniform approval stamp before submitting to the PROJECT MANAGER.
      1. Stamp to include project name, submittal number, specification number, the CONTRACTOR's reviewer name, date of the CONTRACTOR's approval, and statement certifying that submittal has been reviewed, checked, an approved for compliance with the Contract Documents.
      2. The PROJECT MANAGER and ENGINEER will not review submittals that do not bear CONTRACTOR's approval stamp and will return them without action.

2. Complete, sign, and transmit with each submittal package, one Transmittal of CONTRACTOR's submittal form attached at the end of this section.

3. Identify each submittal with the following:
   a. Numbering and Tracking system:
      1. Sequentially numbered each submittal.
      2. Resubmission of submittal shall have original number with sequential alphabetic suffix.
   b. Specification section and paragraph to which submittal applies.
   c. Project title an OWNERS project number.
   d. Date of transmittal.
   e. Names of the CONTRACTOR, SUBCONTRACTOR, or supplier and manufacturer as appropriate.

4. Identify and describe each deviation or variation from Contract Documents.

5. Submittals and requests for information (RFI) shall use the project submittal interface.
   a. The submittal title shall follow the system described in C.3.a
   b. All required fields shall be populated with the appropriate information to ensure timely processing by the City.

E. Format:

1. Do not base Shop Drawings on reproductions of Contract Documents.

2. Package submittal information by individual specification section. Do not combine different specification sections together in submittal package, and less otherwise directed in specification.

3. Present in a clear and thorough manner and insufficient detail to show kind, size, arrangement, and function of components, material and devices, and compliance with Contracts Documents.

4. Index with sections labeled and divided in an orderly manner.

F. Timeliness: Schedule an submit in accordance with schedule of shop drawings and sample submittals and requirements of individual Specification sections.

G. Processing Time:
1. Time for review shall commence on the PROJECT MANAGER's receipt of submittal.
2. The PROJECT MANAGER will act upon the CONTRACTOR's submittal and transmit response to CONTRACTOR not later than 14 days after receipt, unless otherwise specified.
3. Resubmittal will be subject to same review time.
4. No adjustments of contract times of price will be allowed due to delays in progress of work caused by rejection and subsequent resubmittals.

H. Resubmittals: Clearly identify each correction or change made

I. Incomplete Submittals:

1. The PROJECT MANAGER will return entire submittal for the CONTRACTOR's revision if preliminary review deems incomplete.
2. When any of the following are missing, Submittal will be deemed incomplete:
   a. The CONTRACTOR's review stamp, completed and signed.
   b. Transmittal of CONTRACTOR's submittal, completed and signed.

c. Insufficient number of copies.

J. Submittals not required by Contract Documents:

1. Will not be reviewed and will be returned stamped "not subject to review."
2. The PROJECT MANAGER will keep one copy and will return all remaining copies to the CONTRACTOR.

1.4 ACTION SUBMITTALS

A. Prepare and submit action submittals required by individual specification sections.

B. Shop Drawings:
1. Identify and Indicate:
a. Applicable Standard Detail number, products, units, an assembly, and system or equipment identification or tag numbers.
b. Equipment and Component Title: identical to title shown on Standard Details.
c. Critical field dimensions and relationships to other critical features of work. Note dimensions established by field measurement.
d. Project-specific information drawn accurately to scale.

2. Manufacturers Standard Schematic Drawing and Diagrams as follows:
a. Modify to delete information that is not applicable to the work.
b. Supplement standard information to provide information specifically applicable to the work.

3. Product Date: Provide as specified in individual specification section.

4. Foreign Manufacturers: When proposed, include the following additional information:
a. Names and addresses of at least two (2) companies that maintain technical service representative close to project.
b. Complete list of spare parts in accessories for each piece of equipment.

C. Samples:
1. Copies: Three (3), unless otherwise specified in individual specification sections.

2. Preparation: Mount, display, or package samples in manner specified to facilitate review of quality. Attached label on unexposed side that includes the following:
a. Manufacturer name
b. Model number
c. Material
d. Sample Source

3. Manufacturer's color chart: units or sections of units showing full range of colors, textures, and patterns available.

4. Full-size Samples:
a. Size as indicated in individual specifications section.
b. Prepared from same materials to be used for the work.
c. Cured and finished in manner specified.
d. Physically identical with product for proposed use.

D. Action submittal dispositions: the ENGINEER will review, mark, and stamp as appropriate, and PROJECT MANAGER will distribute marked up copies as noted:
1. Approved:
a. CONTRACTOR may incorporate product(s) or implement work covered by

submittal.

2. Approved as Noted:
   a. CONTRACTOR may incorporate product(s) or implement work covered by submittal, in accordance with ENGINEER's notations.

3. Partial Approval, resubmit as Noted:
   a. Make corrections or obtain missing portions and resubmit.
   b. Except for portions indicated, CONTRACTOR may begin to incorporate product(s) or implement work covered by submittal, in accordance with ENGINEER's notations.

4. Revise and Resubmit:
   a. CONTRACTOR may not incorporate product(s) or implement work covered by submittal.

5. Not subject to review: Information received is not required by contract.

1.5 INFORMATION SUBMITTALS

A. General:
   1. Refer to individual specification sections for specific submittal requirements.

   2. The PROJECT MANAGER will review each submittal. If the submittal meets conditions of the contract, the PROJECT MANAGER will forward copies to the appropriate parties. If the PROJECT MANAGER determines submittal does not meet conditions of the contract and is therefore considered unacceptable, PROJECT MANAGER will provide review comments to the CONTRACTOR, and require that the submittal be corrected and resubmitted.

B. Application for payment: in accordance with Section 01025, MEASUREMENT AND PAYMENT.

C. Certificates:
   1. General
      a. Provide notarized statement that includes signature of entity responsible for preparing certification.
      b. Signed by officer or other individual authorized to sign documents on behalf of that entity.

   2. Welding: In accordance with individual Specification Sections.

   3. Installer: Prepare written statements on manufacturers letterhead certifying that installer complies with requirements as specified in individual specification sections.

   4. Material Test: Prepared by qualified testing agency, on testing agencies standard form, indicating an interpretating test results of material for compliance with requirements.

   5. Certificates of successful testing or inspection: submit when testing or inspection is required by laws and regulations or governing agency or specified in individual specification section.

   6. Manufacturer Certificate of Compliance: in accordance with Section 01640 MANUFACTURERS SERVICES.

   7. Manufacturers Certificate of Proper Installation: in accordance with Section 01640 MANUFACTURERS SERVICES

D. Construction photographs and video in accordance with Section 01040 COORDINATION, an as may otherwise be required in Contract Documents.

E. Contract Closeout Submittals: in accordance with Section 01780 CONTRACT CLOSEOUT.

F. CONTRACTOR-Design Data:

1. Written graphic information.
2. List of assumptions.
3. List of performance and design criteria.
4. Summary of loads and load diagram, if applicable
5. Calculations.
6. List of applicable codes and regulations.
7. Name and version of software.
8. Information requested in individual specification section.

G. Manufacturer's Instructions: Written of published information that documents the manufacturers recommendations, guidelines, and procedures in accordance with individual specification sections.

H. Schedules:
1. Schedule of Shop Drawing and Sample Submittals: Prepare separately or in combination with progress schedule as specified in Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.
    a. Show for Each, at a Minimum, the following:
        1. Specification section number.
        2. Identification by numbering and tracking system as specified under paragraph transmittal of submittal.
        3. Estimated date of submission to the PROJECT MANAGER, including reviewing and processing time.
    b. On a monthly basis, submit updated schedule to the PROJECT MANAGER if changes have occurred or resubmittals are required.

2. Schedule of values: in accordance with Section 01025 MEASUREMENT AND PAYMENT.

3. Schedule of estimated progress payments: in accordance with Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

4. Progress Schedule: in accordance with Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

I. Special Guarantee: Supplier's written guarantee as required in individual Specifications sections.

J. Statement of Qualification: Evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, ENGINEER, materials testing laboratory, specialty Subcontractor, trade specialist, consultant, installer, and other professionals.

K. Submittals Required by Laws, Regulations and Governing Agencies:
1. Submit promptly notifications, reports, certifications, payrolls, and otherwise as may

be required, directly to the applicable federal, state, or local governing agency or their representative.

2. Transmit to the PROJECT MANAGER for OWNER's records one copy of correspondence and transmittals (to include enclosures and attachments) between the CONTRACTOR and governing agency.

L. Test and Inspection Reports:

1. Shall contain signature of person responsible for test or report.

2. Factory:
   a. Identification of product and specification section, type of inspection or test with reference to standard or code.
   b. Date of test, project title and number, and name and signature of authorized person.
   c. Test results.
   d. If test of inspection deems material or equipment not in compliance with contract documents, identify corrective action necessary to bring into compliance.
   e. Provide interpretation of test results when requested by ENGINEER.
   f. Other items as identified in individual specification sections.

3. Field: As a minimum include the following:
   a. Project title and number.
   b. Date and time.
   c. Record of temperature and weather conditions.
   d. Identification of product and specification section.
   e. Type and location of test, sample, or inspection, including reference standard or code.
   f. Date issued, testing laboratory name, address, and telephone number, name, and signature of laboratory inspector.
   g. If test inspection deems material or equipment is not in compliance with contract documents, identify corrective action necessary to bring into compliance.
   h. Provide interpretation of test results, when requested by ENGINEER.
   i. Other items as identified in individual specification sections.

M. Training date: In accordance with Section 01640 MANUFACTURERS SERVICES.

1.6 CONTRACTOR CORRESPONDENCE

A. The CONTRACTOR shall submit selected construction related correspondence. During the preconstruction meeting the CONTRACTOR shall be instructed by City of Fort Lauderdale Project Construction Manager on the details of possessing such documents for this project.

B. The CONTRACTOR shall be required to track at a minimum, the following documents:
   1. RFI's
   2. CCIR's
   3. Daily Reports

1.7 SUPPLEMENTS

A. Supplement listed below, following "END OF SECTION" is part of this specification.
   1. Supplemennt-1, Transmittal of CONTRACTOR's Submittal.

1.8 PROGRESS PAYMENTS/ REQUISITIONS FOR PAYMENT

A. The CONTRACTOR is responsible for creating the initial payment requisition. Each requisition shall be produced from updated progress data contained in the schedule an updated progress data. On a bi-weekly basis the CONTRACTOR shall meet with the PROJECT MANAGER to discuss and agree on the progress of the work. Failure of the CONTRACTOR to maintain record documents and submit project schedule updates may result in a delay in processing monthly or final payment requisitions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01320
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

A. This section includes administrative and procedural requirements for documenting the progress of construction during performance of the work, including the following:

1. CONTRACTOR's Construction Schedule.
2. Submittals Schedule.
3. Daily Construction Reports.
4. Field Condition Reports.

1.2 DEFINITIONS

A. Activity: a discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.

2. Predecessor Activity: an activity that precedes another activity in the network.

3. Successor Activity: an activity that follows another activity in the network.

B. CPM: Critical Path Method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall project duration and contains no float.

D. Float: the measure of leeway in starting and completing an activity.

1. Load time belongs to the OWNER.

1.3 SUBMITTALS

A. Submittals Schedule: Submit schedule electronically. Arrange the following information in tabular format.

1. Scheduled date for first submittal.
2. Submittal category (action or informational)
3. Description of the work covered.
4. Scheduled date for the OWNER's final release or approval.

B. CONTRACTOR's Construction Schedule: Submit initial schedule large enough to show entire schedule for entire construction period.

C. Update Schedule on a monthly basis with changes to projected completion and actual progress.

D. Each Friday, submit four (4) weeks total of scheduling showing:

1. One-week schedule indicating detailed work for the following week.

2. Three-week look ahead schedule (as detailed as possible) for the following three (3) weeks

E. Daily Construction Reports: Submit copies to the PROJECT INSPECTOR at the close of each business day.

F. Field Construction Reports: Submit at time of discovery of different conditions.

G. As built and Asset Data: The CONTRACTOR shall provide as built and data for all assets the CONTRACTOR works on in a fashion that it is compatible with the City Asset Management System "CityWorks". Delivery methods shall include desk top viewing and database import with minimal asset manipulation. Contractor shall package the data in WINCAM Vx software or later software version. Contractor is responsible to ensure the data generated by them is concordant with CITYWORKS asset management system. Any changes incurred by the contractor due to lack of coordination or preparation by the contractor, shall be corrected by the contractor at no cost to the City.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities in with scheduling and reporting of separate CONTRACTORS.

B. Coordinate the CONTRACTOR's construction schedule with the schedule of values, list of submittals schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for preforming critical elements of the work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication and delivery when establishing dates.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and the CONTRACTOR's construction schedule.

2. Submit concurrently with the first complete submittal of the CONTRACTOR's construction schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final

Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
2. Submittal Review Time: Include review and resubmittal times indicated in Section 01300 SUBMITTALS in schedule. Coordinate submittal review times in the in the CONTRACTOR's construction schedule with submittals schedule.

3. Substantial Completion: Indicate completion in advance of date established for substantial completion and allow time for Architect's administrative procedures necessary for certification of substantial completion.

B. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time impact analysis to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM Schedule)

A. CPM Schedule Preparation: Prepare a list of all activities required to complete the work included in each work order. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and the relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

a. Preparation and processing of submittals.

b. Mobilization and demobilization.

c. Purchase of materials.

d. Delivery.

e. Installation.

f. Work by OWNER that may affect or be affected by CONTRACTOR's activities

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with contract milestone dates.

2.4 REPORTS

A. Daily construction reports: Prepare a daily construction report recording the following information concerning events at Project Site:

1. Preparation and processing of submittals.
2. Show mobilization and the mobilization.
3. Equipment at Project Site
4. Material deliveries
5. High and low temperatures in general weather conditions.
6. Accidents.
7. Stoppages, delays, shortages, and losses.
8. Meter readings and similar recordings.

9. Orders and requests of authorities having jurisdiction.

10. Work completed.

B. Field Condition Reports: immediately on discovery of a difference between field conditions and the contract documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions together with recommendations for changing the contract documents.

PART 3 EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. CONTRACTOR'S Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regular regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the work progresses, indicate actual completion percentage for each activity.

B. Distribution: Distribute approved schedule to OWNER, separate CONTRACTORs, testing in inspecting agencies, and other parties identified by the CONTRACTOR with a need-to-know schedule responsibility.

1. Post copies in project meeting rooms and temporary field offices.

2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUBMITTALS

A. Informational Submittals:

1. Copies of Permits and approvals for construction as required by laws and regulations and governing agencies.
2. Temporary Utilities Submittals: Dewatering well locations.
3. Temporary construction submittals:
   a. Dewatering facilities.
   b. Fencing and protective barrier locations and details.
   c. Staging area location plan.
   d. Maintenance of Traffic (MOT) Plans: As specified herein and proposed revisions thereto
   e. Plan for maintenance of existing sanitary sewer services and systems.

1.2 MOBILIZATION

A. Mobilization shall include, but not be limited to these principal items:
   1. Obtaining required permits.
   2. Providing on-site sanitary facilities and potable water facilities as specified and as required by Laws and Regulations and governing agencies.
   3. Posting OSHA required notices an establishing safety programs and procedures.
   4. Having the CONTRACTOR's Superintendent at site full time.

B. The CONTRACTOR is responsible for finding suitable locations for project staging and material storage areas which will be approved by OWNER. The CONTRACTOR shall be responsible for securing a temporary staging permit from the OWNER and other approval authorities as appropriate.

1.3 PERMITS

A. Permits, Licenses, or Approvals: Obtain in accordance with the OWNER's construction standards and specifications and is otherwise required for completion of the work.

1.4 PROTECTION OF WORK AND PROPERTY

A. Comply with OWNER's safety rules while on OWNER's project.
B. Keep OWNER informed of serious on-site accidents and related claims.

1.5 VEHICULAR TRAFFIC

A. Maintenance of Traffic Plans (MOT's)

1. Adhere to MOT's reviewed and accepted by the CITY ENGINEER and approved by the appropriate agency (City, County or State). Changes to this plan shall be made only by written approval of appropriate public authority and the CITY ENGINEER. Secure approvals for necessary changes so as not to delay progress of the work.

2. Traffic Routing: In MOT, show sequences of construction affecting use of roadways, time required for each phase of the work, provisions for decking over excavations and phasing of operations to provide necessary access, and plans for signing, barricading, and stripping to provide passages for pedestrians and vehicles.

B. Preparation of MOT's: The CONTRACTOR shall prepare and submit MOT's were required by federal, state, county, or local agencies having jurisdiction. The CONTRACTOR shall obtain all required approvals and permits associated with the MOT's.

1. Traffic control on all city, county, and state highway rights of way shall meet the requirements of the City of Fort Lauderdale, where applicable, and the Florida Department of Transportation Standard Specifications for road and bridge construction, as well as FDOT standard details for Maintenance of Traffic, in accordance with the manual for Uniform Traffic Control and Safe Practices.

2. Traffic control on all county rights-of-way shall meet the additional requirements of the Broward County engineering department including but not limited to:

   a. Notification of intent to commence work activities in a county right-of-way shall provide to the CITY ENGINEER no less than ten (10) business days prior to the start of construction.

   b. The use of solid barriers to separate construction from adjacent traffic lanes where the difference in grade is greater than 12 inches.

   c. Plating or backfilling of all non-protected excavations at the close of each working day.

   d. Broward County shall be named as an additional insured on surety bonds for any projects requiring work within county rights-of-way.

3. Temporary Traffic Control on City streets shall utilize barrels in lieu of folding barricades. CONTRACTOR is to provide a sample or detail of the proposed barrel to be used as part of the MOT submittal.

4. Traffic Control on all FDOT or Broward County highways shall include flag men during all periods of active construction.

5. CONTRACTOR shall submit copies of all MOTS to the CITY ENGINEER concurrent with submittal to the approving authority.

6. CONTRACTOR shall submit three (3) copies of the agency approved MOT prior to initiation of construction or as required by specific permits contained herein.

7. All MOTs shall be ATS certified.

1.6 PEDESTRAIN TRAFFIC

A. The "MAINTENANCE OF TRAFFIC" Plan, provided by the CONTRACTOR, shall include provisions for pedestrian and transit vehicular traffic where applicable. The following are minimum requirements:

1. The CONTRACTOR shall be responsible for providing a safe an adequate walking surface applicable to the Americans with Disabilities Act (ADA) for pedestrians. Safe walk routes for all pedestrians and transit users within the vicinity of the construction zone shall be maintained throughout construction. This includes safe walk routes/access to and from existing bus stops and transit vehicles. If the current walking surface an access to and from transit vehicles at bus stop cannot be maintained, then a temporary road rock four (4) foot walkway shall be created. The safe walk route shall be separated from the construction activity by the four (4) foot high orange

construction fence for the entire length of the project or the length of the walk route, whichever is less.

2. Pedestrian walkways, bus stops in pedestrian access to transit vehicles should be maintained free of any obstructions and hazards such as holes, debris, mud, construction equipment, stored materials, etc. Any hazard near or adjacent to the walkways, bus stops an access to transit vehicles should be clearly delineated.

3. Where street closures do not allow access for scheduled garbage and refused removal, the CONTRACTOR shall provide for moving residential containers to a suitable collection point on regular pickup days.

4. Where is safe pedestrian access/walkways cannot be provided, pedestrians should be directed to alternative routes by appropriate traffic control devices. Pedestrian, bicycle and wheelchair traffic shall be guided and maintained (special attention is directed to the existing bus stop location access) using approved warning light, signing, and channelization devices. Such control devices shall be installed and maintained in accordance with the MUTCD sections on work zone traffic control for pedestrians and chapter 6-D Pedestrian and Worker Safety.

5. Where construction activities involve consecutive bus stops, access to and from all bus stops should be maintained. If access to and from all bus stops cannot be maintained, then a bus stop may be temporarily relocated or removed. However, no two consecutive bus stops shall be affected in this manner. If a bus stop requires temporary removal or relocation, then the transit Superintendent at the Broward County Mass Transit Division, 954-357-8381, should be notified ten (10) days prior to the occurrence so that appropriate notification can be completed by the mass transit division.

6. It shall be the responsibility of the CONTRACTOR to install any necessary pavement, road rock, pavement marking and signage and/or any pedestrian signalization and/or signal modification to a accommodate an existing or alternative walk route.

PART 2 PRODUCTS

2.1 PROJECT SIGN

A. Refer to sign detail located in the supplement at the end of this section.

B. Two (2) signs required. Placement at the direction of the OWNER.

2.2 COMPUTER SOFTWARE, LATEST VERSIONS

A. Software requirements are valid for project use with or without an ENGINEER's field office:

1. Latest Microsoft Windows professional version.
2. Microsoft Office pro-latest version
3. Scheduling: Microsoft Project
4. Microsoft Outlook

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

A. Water:

1. Hydrant Water:

a. Is available from nearby hydrants. Secure written permission for connection, meter installation, and use from City's water department and meet requirements for use. Notify Fire Department before obtaining water from fire hydrants.

b. Use only special hydrant-operating wrenches to open hydrants. Make certain that hydrant valve is open full, since cracking the valve causes damage to the hydrant. Repair damaged hydrants and notify appropriate agency as quickly as possible. Hydrants shall be always completely accessible to fire department.

c. Include costs to connect and transport water to construction areas in contract price. The CONTRACTOR will be invoiced for water obtained from City hydrants.

B. Heating, Cooling and Ventilating:

1. Provide as required to maintain adequate environmental conditions to facilitate progress of the work, to meet specified minimum conditions for installation of materials, and to protect materials, equipment, and finishes from damage due to temperature or humidity.

2. Provide adequate forced air ventilation of enclosed areas to cure installed materials, to dispose humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.

3. Pay all costs of installation, maintenance, operation, removal and fuel consumed.

4. Provide portable unit heaters, complete with controls, oil or gas fired, and suitably vented to outside as required for protection of health and property.

5. If permanent natural gas piping is used for temporary heating units do not modify or re-route gas piping without approval of utility company. Provide separate gas metering as required by utility.

C. Sanitary and Personnel Facilities: Provide and maintain facilities for the CONTRACTOR's employees, SUBCONTRACTORS, and all other on-site staff. Service, clean and maintain all facilities and enclosures.

D. Fire Protection: Furnish and maintain on site adequate firefighting equipment capable of extinguishing incipient fires. Comply with applicable parts of National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241)

3.2 PROTECTION OF WORK AND PROPERTY

A. General:

1. Preform work within right-of-way and easements in a systematic manner that minimizes inconvenience to property owners and the public.

2. No residence or business shall be cut off from vehicular traffic for a period exceeding two (2) hours unless special arrangements have been made.

3. Maintain in continuous service all existing oil and gas pipelines, underground power, telephone or communication cable, water mains, irrigation lines, sewers, poles and overhead power, and all other utilities encountered throughout the project , unless other arrangements satisfactory to OWNERs of said utilities have been made.

4. Where completion of the work requires temporary or permanent removal and/or relocation of existing utility, coordinate all activities with OWNER of said utility and perform all work to their satisfaction.

5. Protect, shore, brace, support and maintain underground pipes, conduits, drains and other underground utility construction uncovered or otherwise affected by construction operations.

6. Always keep fire hydrants and water control valves free from obstruction and available for use.

7. In areas where the CONTRACTOR's operations are adjacent to or near a utility, such as a gas, telephone, television, electric power, water, sewer, or irrigation system and such operations may cause damage or inconvenience, suspend operations until arrangements necessary for protection have been made by the CONTRACTOR.

8. Notify property owners and utility offices that may be affected by construction operation at least five (5) working days in advance.

    a. Before exposing a utility, obtain utility OWNER's permission. Should service of utility be interrupted due to the CONTRACTORS operation, notify prior authority immediately. Cooperate with said authority in restoring service as promptly as possible and their costs incurred.

9. Do not impair operation of existing utility systems. Prevent construction material, pavement, concrete, earth, volatile and corrosive wastes and other debris from entering sewers, storm drains, pump stations, or other sewer structures.

10. Maintain original site drainage whenever possible.

B. Traffic Signal Communications Systems:

1. Maintain in continuous operation all existing traffic signal communication systems located within the Project limits for the duration of the project. Maintenance of the traffic signal communication systems may entail the use of leased facilities, temporary splices, or the provision of alternate or replacement facilities as proposed by the CONTRACTOR and approved by the Broward County Traffic Engineering Division.

2. In the event of failure in the continuous operation of the traffic signal communication system, prepare a Remedial Action Plan that has been coordinated with the Broward County Traffic Engineering Division to determine the nature of the failure. The Remedial Action Plan shall be documented in written report and submitted within one (1) calendar day of the notification of the discontinuous operation of the traffic signal communication system.

3. Complete the implementation of the Remedial Action Plan within two (2) calendar days upon receipt of approval of the plan by the Broward County Traffic Engineering

Division. Reworking of the plan shall be required if the minimum system communication requirements are not met, as determined by the Broward County traffic engineering division, because of a given remedial action plan.

4. If the traffic signal communication systems are damaged, a temporary splice or a damaged copper communications cable shall be accomplished by using ~~appropriate~~ approved splice material for connecting the bare wires. For damaged fiber optic communication systems, mechanical splicing of the fiber to achieve a maximum loss of 0.20 DB is acceptable. A junction box shall be installed over this place on a temporary basis for access unless a new cable is installed as per specifications.

5. Any material furnished and installed for the replacement of existing traffic communications infrastructure shall meet Broward County standards. CONTRACTOR's installing or repairing traffic communications infrastructure shall be approved by Broward County.

6. All traffic signal communication systems that were temporarily spliced shall be removed and replaced in kind with new cable, subject to approval by the Broward County Traffic Engineering Division, prior to final acceptance of the Project. Replacement shall be from junction box to junction box with no intermediate splices.

C. Site Security

1. General – Code Yellow or Less:

a. All Sites: Provide and maintain temporary security fences as necessary to protect the work and CONTRACTOR furnished products not yet installed.

b. Secure sites include, but are not limited to, water treatment plants, wastewater treatment plants, well fields, water booster pump stations, storage facilities, and master lift stations.

c. All employees shall have a company or city provided photo identification badge to be always worn while on a secure project site.

d. Visitors shall be required to obtain daily visitor badges and vehicle access.

e. Obtain approval in writing from the OWNER for work on secure sites outside of normal working hours. Approval must be available for inspection while working on the site after hours.

2. Code Orange conditions for work on Secure Sites:

a. The CONTRACTOR shall provide a list to be updated weekly or whenever employees are added or removed, of all employees and subcontractor employees to be provided site access. Access for employees or visitors cannot be guaranteed and it is subject to the discretion of the security personnel.

b. All employees show our badges sign-in daily.

c. The CONTRACTOR shall provide advance notice and coordinate with the OWNER for screening and delivery of all materials and supplies, including FedEx, U.S. Postal service, UPS, and all general delivery items.

1. All packages shall have the name of a CONTRACTOR's employee stationed at the job site.

2. All delivery drivers shall have suitable photo identification and will be required to go through security procedures.

3. No delay claims will be allowed for failure to obtain clearance for deliveries or delays associated with the above processes.

3. Code Red Conditions:

a. Work on secure sites will be stopped for the duration of code red conditions. No access by CONTRACTOR or SUBCONTRACTOR personnel will be permitted until clearance has been granted by the OWNER.

D. Barricade and Lights:

1. Provide as necessary to prevent unauthorized entry to construction areas and affected roads, streets, and alleyways, inside and outside a fenced area, and as required to ensure public safety and the safety of CONTRACTOR's employees, or other employers' employees, and others who may be affected by the work.

2. Provide to protect existing facilities and adjacent properties from potential damage.

3. Locate to enable access by facility operators and property OWNERS.

4. Protect streets, roads, highways, and other public thoroughfares that are closed to traffic by effective barricades with acceptable warning signs.

5. Locate barricades at the nearest intersecting public thoroughfare on each side of the block section.

E. Signs and Equipment:

1. Conform to requirements of manual published by the FDOT.

2. Barricades: Provide as required by the FDOT vehicle code and in sufficient quantity to safeguard public and work. Only use approved barrels-collapsible barrels will not be permitted.

3. Portable TOW-AWAY-NO STOPPING signs: Placed where approved by Police Department in OWNER.

4. Traffic cones: provide to delineate traffic lanes to guide and separate traffic movements.

5. Hi-Level Warning Flag Units: Provide two (2) in advance of traffic approaching the work, each displaying three flags mounted at a height of nine (9) feet.

6. ROAD CONSTRUCTION AHEAD Signs: Provide four (4), size 48 inches by 48 inches. Placing in conspicuous locations, approximately 200 feet in advance of the work, and facing approaching traffic.

7. DETOUR Signs: provide two (2), right arrow or left arrow, placed as approved by the CITY ENGINEER.

8. RIGHT or LEFT LANE CLOSED AHEAD Signs: provide two (2), place in advance of lane to be closed.

9. Provide at obstructions, such as material piles and equipment.

10. Illuminate barricades and obstructions with warning lights from sunset to sunrise.

11. Use to alert the public of construction hazards, which would include surface irregularities, unramped walkways, grade changes, and trenches or excavations in roadways and in other public access areas.

12. Submit proposed signage to the CITY'S MOT approval Department for prior approval.

F. Existing Structures: Where CONTRACTOR contemplates removal of small structures such as mailboxes, signposts, and culverts that interfere with CONTRACTOR's operations, obtain approval of property owner and CITY ENGINEER. Replaced those removed in a condition equal to or better than original.

G. Waterways: Keep ditches, culverts, and natural drainage continuously free of construction materials and debris.

H. Dewatering: Construct, maintain, and operate cofferdams, channels, flume drains, stumps, pumps, or other temporary diversion and protection works. Furnish materials required, install, maintain, and operate necessary pumping and other equipment for the environmentally safe removal and disposal of water from the various parts of the work. Maintain foundations and parts of the work free from water.

3.3 TEMPORATY CONTROLS:

A. Air Pollution Control:

1. Minimize air pollution from construction operations.

2. Burning of waste materials, rubbish, or other debris will not be permitted on or adjacent to site.
3. Conduct operations of dumping rock and of carrying rock away in trucks to cause a minimum of dust. Give unpaved streets, roads, detours, or haul roads used in construction area a dust-preventive treatment or periodically water to prevent dust as needed up to daily, as directed by the OWNER. Strictly adhere to applicable environmental regulations for dust prevention.

B. Noise Control:

1. Provide acoustical barriers so no noise emanating from tools or equipment will not exceed legal noise levels.

2. Noise Control Plan: Proposed plan to mitigate construction noise and to comply with noise control ordinances, including method of construction, equipment to be used, acoustical treatments.

C. Water Pollution Control:

1. Divert sanitary sewage in non- storm waste flow interfering with construction and requiring diversion to sanitary sewers. Do not cause or permit action to occur which would cause an overflow to existing waterway.

2. Prior to commencing excavation and construction, obtain ENGINEER's agreement with detailed plans showing procedures intended to handle and dispose of sewage, groundwater, and stormwater flow, including dewatering pump discharges.

3. Comply with procedures outlined in U.S. Environmental Protection Agency manuals entitled, "Guidelines for Erosion and Sedimentation Control Planning", and "Implementation, Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity", and "Erosion and Sediment Control- Surface Mining in Eastern United States."

4. Do not dispose of volatile wastes such as mineral spirits, oil, chemicals, or paint thinner in storm or sanitary drains. Disposal of waste into streams or waterways is prohibited. Provide acceptable containers for collection and disposal of waste materials, debris and rubbish.

D. Erosion, Sediment and Flood Control: Provide, maintain and operate temporary facilities to control erosion and sediment releases, and to protect the work and existing facilities from flooding during construction period. Meet all local, state, and federal requirements and obtain necessary permits and approvals as required. Discharges to storm drains, including discharge from dewatering systems will not be permitted without the installation of a sediment removal system approved by the OWNER.

3.4. STORAGE YARDS AND BUILDINGS

A. Coordinate requirements with Section 01600 MATERIAL AND EQUIPMENT.

B. Temporary Storage Yards: Construct temporary storage yards for storage of products that are not subject to damage by weather conditions.

C. Temporary Storage Buildings:

1. Provide environmental control systems that meet recommendations of manufacturers of equipment and materials stored.
2. Arrange or partition to provide security of contents and ready access for inspection and inventory.
3. Store combustible materials (paints, solvents, fuels) in a well-ventilated and remote building meeting safety standard.

D. Storage and staging facilities are permitted on private property subject to the review and approval of the Planning and Zoning Department and the issuance of a permit under provisions of section 47-19.2 of the Unified Land Development Regulations.

1. Notice to Proceed will not be issued until the final approval is obtained.

2. Staging area requirements are provided at the end of this Section (01500-01 Staging Permit Ordinance – Supplement 1).

3.5 ACCESS ROADS AND DETOURS

A. Construct access roads as shown and within easements, rights of way, or project limits. Utilize existing roads where shown. Alignments for new routes must be approved by CITY ENGINEER or OWNER.

B. Maintain drainage ways. Install and maintain culverts to allow water to flow beneath access roads. Provide corrosion-resistant culvert pipe of adequate strength to resist construction loads.

C. Provide gravel, crushed rock or other stabilization material to permit access by all motor vehicles at all times.

D. Maintain road grade and crown to eliminate potholes, rutting and other irregularities that restrict access.

E. Coordinate with CITY ENGINEER detours and other operations affecting the traffic and access. Provide at least 72 hours' notice to CITY ENGINEER of operations that will alter access to the site and adjacent private properties.

F. Where access road crosses existing fences, install and maintain gates.

G. Upon completion of construction, restore ground surface disturbed by access road construction to original grade. Replaced damaged or broken culverts with new culvert pipe of same diameter and material.

3.6 PARKING AREAS

A. Control vehicular parking to preclude interference with public traffic or parking, access by emergency vehicles, OWNER's operations, or construction operations.

B. Provide parking facilities for personnel working on the project. No employee or equipment parking will be permitted on OWNERs existing paved areas, except as specifically designated for CONTRACTOR's use.

3.7 VEHICULAR TRAFFIC

A. Comply with laws and regulations regarding closing or restricting use of public streets or highways. No public or private roads shall be closed, except by written permission of proper authority. Assure the least possible obstruction to traffic and normal commercial pursuits.

B. For Project sections that pass through a Broward County School Zone:

1. No work is permitted in a school zone while school is in session.

2. The CONTRACTOR shall plan work accordingly- no delay time will be granted to comply with this requirement.

C. Conduct the work to interfere as little as possible with public travel, whether vehicular or pedestrian.

1. No two (2) adjacent roadways can be under construction at the same time.

D. Whenever it is necessary to cross, close, or obstruct roads, driveways and walks, whether public or private, provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel.

E. Roadway Closures: Maintain satisfactory means of exit for persons residing or having occasion to transact business along route of the work. If it is necessary to close off roadway or alley providing sole vehicular access to property for periods greater than two (2) hours, provide written notice to each owner so affected five (5) days prior to such closure. In such cases, closing of up to four (4) hours may be allowed. Closures of up to ten (10) hours may be allowed if a week's written notice is given and undue hardship does not result.

F. The CONTRACTOR will submit MOT forms and/or applications as required by the agency with

jurisdiction. The Temporary Modification of Traffic (MOT) routing form provided as a supplement to this section shall be submitted to MOT@forlauderdale.gov for all requested MOTs in accordance with the provisions of this section. The form is required for MOTs in streets under CITY jurisdiction. For questions related to the form call 954.828.4997.

G. Maintenance of traffic is not required if the CONTRACTOR obtains written permission from the OWNER and tenant of private property, or from authority having jurisdiction over public property involved, to obstruct traffic at designated point.

H. In making street crossings, do not block more than one-half the street at a time. Whenever possible widened shoulder on opposite side to facilitate traffic flow. Provide temporary surfacing on shoulders, as necessary.

I. When flaggers and guards are required by regulation or when deemed necessary for safety, furnish them with approved orange wearing apparel and other regulation traffic control devices.

J. Notify Fire Department and Police Department before closing street or portion thereof. Notify said departments when streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, more than 300 linear feet, without written permission from fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish the CONTRACTOR's night emergency telephone numbers to Police Department.

K. Move mailboxes to temporary locations accessible to Postal Service, and on completion of work in each area replace them in their original location and in a condition equal to or better than original.

L. Remove or relocate barricades on designated trash collection days to allow access for trash pickup. If access is completely blocked, the CONTRACTOR shall move the affected trash containers to an accessible location and return them after pickup. Mark each container to ensure return to the proper location.

M. Temporary Bridges:

1. Construct temporary bridges at all points where maintenance of traffic across pipeline construction is necessary.

2. Make bridges over public streets, roads, and highways acceptable to authority having jurisdiction thereover.

3. Bridges erected over private roads and driveways shall be adequate for a service to which they will be subjected.

4. Provide substantial guardrails and suitable protected approaches.

5. Provide foot bridges not less than four (4) feet wide with handrails and uprights of dressed lumber.

6. Maintain bridges in place if conditions of the work required their use for safety of public, except that when necessary for proper prosecution of the work in immediate vicinity of bridge. Bridge may be relocated or temporarily removed for such period as the ENGINEER may permit.

N. Detours: Where authority having jurisdiction requires that traffic be maintained over construction work in a public street, road, or highway, and traffic cannot be maintained on

original roadbed or pavement, construct and maintain detour around the work.

O. Coordinate traffic routing with that of others working in same or adjacent areas.

3.8 CLEANUP PROCEDURES FOR HURRICANE WARNINGS AND WATCHES

A. If the National Oceanographic and Atmospheric Administration (NOAA) if issues a hurricane watch for the Fort Lauderdale area, the CITY ENGINEER will contact the CONTRACTOR informing him that the watch has been established. Once notified of a hurricane watch, the CONTRACTOR will remove all unnecessary items from the work area and tie down all remaining supplies, barricades, and movable (under 200 pounds) objects. The CITY ENGINEER will determine "necessary" items. If a warning is issued, the CONTRACTOR shall complete the cleanup and evacuate the area the same day. The OWNER shall not be liable for any costs or delays caused as a result of the demobilization or remobilization due to the above.

3.9 CLEANING DURING CONSTRUCTION

A. In accordance with General Conditions, as may be specified in specification sections, and as required herein.

B. Wet down exterior surfaces prior to sweeping to prevent blowing of dust and debris.

C. At least weekly, sweep all floors (basins, tunnels, platforms, walkways, roof surfaces), and pick up all debris and dispose.

D. Provide approved containers for collection and disposal of waste materials, debris, and rubbish. At least weekly intervals dispose of such waste materials, debris, and rubbish offsite.

E. Thoroughly clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation. Sidewalks, unless under construction, shall be kept clear of material, and available for pedestrian use at all times.

3.10 PROJECT SIGNS

A. Provide two (2) project signs, painted and mounted as shown in Section 01590 PROJECT SIGN, at locations to be determined by the OWNER or ENGINEER.

3.11 SUPPLEMENTS

A. The supplements listed below, following "END OF SECTION", are part of this specification.

1. Supplement 1, Staging Permit Ordinance.
2. Supplement 2, Temporary Modification of Traffic (MOT) Routing Form.
3. Supplement 3, Door Hanger Notification

END OF SECTION

SECTION 01500-01
STAGING PERMIT ORDINANCE

GG. *Construction staging areas.* The staging of public purpose construction projects including but not limited to the construction of public rights of way, utilities and facilities, may be prevented in all zoning districts as a temporary use, in order to allow for the safe, efficient completion of the project with minimal disruption to existing residents, businesses and traffic, and to ensure that public services and facilities are available. Construction staging shall include the parking, placing and storing of construction materials, vehicles, equipment and support facilities required for the construction of a public project. Construction staging areas shall be permitted subject to the following review processes and conditions:

1. Application. An application shall, in addition to the requirements provided in *Section 47-24*, development permits and procedures, include the following:

    a. A description and sketch dimensioned to scale of the subject property proposed to be used as a construction staging area and a description of the proposed use of the area, including such information as the location and type of construction materials, equipment, support facilities, vehicles, trailers or other construction equipment, storage areas for materials, traffic circulation plan to and from the site, access to the site, location, type of materials and details of any required fencing.

    b. A sketch of the proposed site signage, including all contact information; And the proposed location of the sign.

    c. The time required to complete public construction project.

    d. A statement signed by property owner acknowledging that the property owner consents to the temporary use of the property for construction staging as provided in the temporary construction permit application and that the property owner shall be held responsible for the removal of construction staging materials and a brief. If applicant fails to do so upon termination of the temporary public purpose construction staging permit.

2. Standards

    a. A fence of a material, design, and construction that meets building code requirements and precludes visibility through the fence, except for openings necessary for safety, shall be erected around the perimeter of the site. The fence will have a minimum height of six (6) feet and a maximum height of ten (10) feet; Such height to be determined as part of the site plan Level l permit based on what height is necessary to protect the adjacent properties.

    b. The site shall be posted within a sixteen (16) square foot sign clearly visible from a Right-of-way identifying the project by name, the name of the CONTRACTOR, and the ENGINEER responsible for construction management, and a phone number where the applicant or its representative can be contacted on a 24-hour basis.

    c. Movement of vehicles, storage materials or other activities at the site shall be limited to the hours of 7:30 AM to 5:30 PM Monday through Friday, unless otherwise specifically approved as provided in the site plan Level l Permit.

    d. Construction staging at the site shall be limited to the activities approved as part of the site plan Level l Permit and no other activities shall be permitted except as approved by amendment of the site plan Level l Permit.

    e. Conditions of approval may be imposed, if necessary, to mitigate the impact on adjacent property such as temporary paving, landscaping, and watering, all in accordance with engineering standards.

f. A termination date for the temporary construction permit shall be established by the department based on the information provided by the applicant, but an extension of such termination date may be granted if good cause is shown by filing an amendment to the site plan Level l Permit.

3. Review Process

a. Approval of a site plan Level l Permit as described in section 47-24.2.

b. In addition to the review process applicable to a site plan Level l Permit, the application shall be forwarded to and reviewed by the City's public services department and the property and Right-of-way committee.

c. A recommendation from the City's public services department and the property and Right-of-way committee shall be forwarded to the department and included as part of the review of the site plan Level l Application.

4. Review criteria. In addition to the review criteria for the site plan Level l Permit, the following shall apply:

a. The proposed plan meets the standards provided in this Section 47-19.2; And
b. The plan includes measures to ensure there is minimal disruption to existing residents, businesses and traffic in the area.

5. Effective date of approval. The approval of a temporary construction staging area application by the department shall not take effect nor shall a permit be issued any sooner than thirty (30) days after approval and then only if no motion is adopted by the City Commission seeking to review the application or no appeal is filed as provided in section 47- 26 B., Appeals.

6. Appeal. If a temporary construction staging permit is denied or is approved with conditions unacceptable to the applicant, the applicant may appeal the decision in accordance with procedures provided in section 47- 26 B., Appeals.

7. If during the course of the construction of the public purpose construction project it is found that activities on the construction staging area site are detrimental to the health, safety and welfare of the public as determined by the city ENGINEER, the applicant shall be given a notice of additional measures that must be taken in order to mitigate the negative impact. If the applicant fails to institute such measures within five (5) calendar days of notice, notice shall be given of a hearing to be held before the city Commission and applicant shall be required to address the impacts associated with the staging area site. If the city Commission finds that the negative impacts exist, it may impose conditions on the construction staging permit. If the applicant fails to demonstrate how the negative impacts will be mitigated or fails to institute the measures within the time required by the city Commission, the city Commission may terminate the permit.

8. Termination of permit. The temporary construction staging permit shall terminate on the date established by the department or the city Commission as provided in this subsection GG.

Upon termination of a temporary construction staging permit the site applicant or property owner shall have 30 days from termination to restore the site back to a clean and safe condition with all construction staging materials and debris removed.

Section 01500-02

Maintenance of Traffic (MOT) Form and Guidelines - Supplement 2

CITY OF FORT LAUDERDALE

MAINTENANCE OF TRAFFIC (MOT) FORM AND GUIDELINES

Office Use Only	MOT ID#: _____

CITY OF FORT LAUDERDALE MAINTENANCE OF TRAFFIC

GUIDELINES AND INSTRUCTIONS

A Maintenance of Traffic (MOT)/Temporary Traffic Control (TTC) plan is required any time work is conducted within or impacts a City of Fort Lauderdale right-of-way(i.e., roadways, alleys, sidewalks, swales, etc.). The Maintenance of Traffic Form and Guidelines will assist you with completing a City MOT request. Please complete all fields on the form and submit it with the Required Signatures Form and all attachments to MOT@fortlauderdale.gov for approval. Please note, incomplete forms will not be processed.

Once the MOT Form is approved by Transportation and Mobility (TAM), please include it as an attachment to the final permit application and submit it to the Department of Sustainable Development (DSD).

If you have any questions about the MOT Form, please call 954-828-4997 or email MOT@fortlauderdale.gov.

GENERAL REQUIRMENTS

- All work within the right-of-way requires an MOT.
- A City MOT Permit is required if the work impacts the City's public right-of-way, even if the work is conducted within Broward County or Florida Department of Transportation's (FDOT) right-of-way.
- If work is being performed in multiple phases or at various locations, an individual MOT is required for each phase/ location.
- Please obtain all required signatures. Incomplete forms will not be processed. Obtaining required signatures **does not** constitute final approval by the City. The MOT may only be implemented after a permit is issued by DSD, subject to satisfaction of all prerequisite conditions. Each submittal takes two weeks to review.
- Staging and storing equipment or materials is not permitted within the City's right-of-way *(Sec. 25-110 of Code of Ordinances)*.
- The MOT plan must be prepared by a certified worksite Traffic Control Technician or Traffic Control Supervisor, as appropriate for job complexity. A legible copy of the technician/supervisor's **valid** certification must be submitted with the MOT plan.
- A certified Traffic Control Supervisor must sign the MOT plan, and a copy of his/her current certification must be included.
- If implementation of an approved permit negatively impacts public safety and/or inconveniences Fort Lauderdale's neighbors, the City may require the MOT APPLICANT to modify the MOT plan. The City may also temporarily suspend or permanently revoke the permit with reasonable notice.
- Refer to Sec. 17-7.4 of Code of Ordinances for information about work occurring overnight.
- If any work will impact parking meters, parking mitigation will be required prior to MOT approval.
- The contractor is responsible for the setup and removal of all MOT devices and equipment in accordance with the times and dates stated in Section 2 of this form.
- The times and dates stated in Section 2 of this form shall be strictly enforced. A revised form must be submitted if the dates or any other significant details change for the approved MOT.
- The approved MOT must be on site prior to and during the entire construction period.

Office Use Only	MOT ID#: _____

CITY OF FORT LAUDERDALE MAINTENANCE OF TRAFFIC

GUIDELINES AND INSTRUCTIONS

FLORIDA DEPARTMENT OF TRANSPORTATION STANDARDS

The MOT plan shall conform to the latest edition of FDOT's Design Standards and Part IV of the Manual of Uniform Traffic Control Devices (MUTCD) for Streets and Highways. Compliance with the requirements of the approved plan are the responsibility of the applicant.

BROWARD COUNTY REQUIREMENTS

If the MOT or detour routes affect any right-of-way within Broward County's jurisdiction (map available on the City's website), the County's Maintenance of Traffic Submittal Form (available on the City's website) should be completed first, including the required signatures, and submitted with this form.

LANE CLOSURES - NO DETOURS

- If detours are not required for this MOT, please state that in Section 6 of this form.
- Fully describe the lanes that will be open and closed during construction in Section 6 of this form.
- Submit applicable FDOT Design Standard Index drawings. The drawings must include the north arrow and the names of the main and cross streets.

LANE CLOSURES - DETOURS

- **Detours of any kind will add extra time to the approval process, especially closure requiring detours in excess of 72 hours.** Where feasible, the City recommends maintaining the flow of two-way traffic and keeping sidewalks open.
- If detour routes affect a FDOT right-of-way, a permit from FDOT must be attached to the City's MOT Form.
- If detour routes affect Broward County's right-of-way, an approved MOT application and plan from Broward County must be attached to the City's MOT form.

If a detour is required (applicable to roadways, alleys, and sidewalks):

- City Manager approval is required for all full/partial detours lasting up to 72 hours.
- Closures lasting more than 72 hours must be approved by the City of Fort Lauderdale Property and Right-of-Way (PROW) Committee and the City Commission. This approval may take a minimum of two months.
- Provide a detour signing/circulation plan that shows other construction projects in progress or that are planned in the vicinity of the project.
- All sidewalk detours must be ADA compliant and adhere to FDOT Standard Index 304 and Chapter 4E of the Manual on Uniform Traffic Control Devices (MUTCD).
- Portable Changeable Message Signs (PCMS) must be placed a minimum of seven (7) days prior to a lane/road closure with detours.

ATTACHMENTS (Electronic files may not exceed 25MB.)

Attachments must include a MOT plan prepared by a certified worksite Traffic Control Technician or Traffic Control Supervisor, as appropriate for the complexity of the job. A legible copy of the technician/supervisor's valid certification must be submitted with the MOT plan.

Office Use Only	MOT ID#: _____

MAINTENANCE OF TRAFFIC (MOT) FORM

SECTION 1: APPLICANT INFORMATION

Applicant Name: _____ Applicant Phone: _____

Applicant Email: _____

Applicant Address: _____
(Address, City, State, Zip Code)

City Project Manager (if applicable): _____ Phone: _____

Agency responsible for this project: ☐ City ☐ County ☐ FDOT ☐ Other: _____

On-site/Emergency Contact Phone: _____

SECTION 2: PROJECT INFORMATION

GMOT Permit # (obtain from Department of Sustainable Development (DSD)): _____

Project Name: _____

Project Address: _____
(Address, City, State, Zip Code)

Specific Dates and Times Requested for MOT Implementation:

Please identify a start date that is at least two weeks from the submittal date. The approval of an MOT application may require up to two weeks from the time that all required documents are received by TAM staff.

Begin Date: _____ Begin Time: _____

End Date: _____ End Time: _____

SECTION 3: PROJECT DETAILS

☐ Partial Closure

☐ Full Road Closure (detour): Under 72 Hours

☐ Sidewalk Closure: Under 72 Hours

☐ Full Road/Sidewalk Closure: More than 72 Hours

Daily Setup/ Breakdown ☐ YES ☐ NO

Using Crane in ROW* ☐ YES ☐ NO

Parking Meters Impacted* ☐ YES ☐ NO

**Crane and parking meter mitigation must be done prior to MOT approval.*

SECTION 4: TYPE OF WORK DESCRIPTION

Please make sure to include the following information in the description:

- List the names of affected streets and the nearest intersection. Use complete street names, including directionals.
- Describe the nature of the construction and any phasing plans. A separate MOT application is required for each phase.
- Describe any specific safety hazards that the work may produce during construction (i.e., large holes, etc.).

_____

_____

_____

_____

SECTION 5: FDOT DESIGN STANDARD INDEX DRAWING NUMBERS/MUTCD TYPICAL APPLICATION

(State which FDOT Standard Index 600 series will be followed. The indexes must include the north arrow and the names of the main and cross streets. Also, state whether trenches will be covered or backfilled during non-working hours.)

_____

_____

Office Use Only	MOT ID#: _____

MAINTENANCE OF TRAFFIC (MOT) FORM

SECTION 6: MOT DESCRIPTION

Please make sure to include the following information in the description:

- List the lanes that will be open and closed on each street and describe any necessary detours in detail. If detours are not required, please state that below.
- State if flagmen will be provided.
- State if the MOT will be continuous or intermittent. If intermittent, state the times of the day the MOT will be in effect.
- State any other special considerations related to this request.

SECTION 7: MOT FORM CHECKLIST (Provide one copy of each attachment.)

- ☐ Completed Required Signatures Form
- ☐ Color aerial(s)/MOT Plan with index overlay
- ☐ County and State approvals (if required)
- ☐ Crane and Parking Mitigation (if required)
- ☐ FDOT Index MUTCD Reference Drawing(s)
- ☐ Certification(s) for Traffic Control Technician or Traffic Control Supervisor must be embedded on MOT plans along with FDOT indexes/MUTCD documents
- ☐ Plan of work (optional, but preferred)

SECTION 8: ADDITIONAL COMMENTS

Please Note: The approval of an MOT application may require up to two weeks from the time that all required documents in the checklist above are received by TAM staff. Any rejected MOT submittal that is corrected and sent back will be considered a new submittal, which may require up to two additional weeks to approve. Additional time may be needed for more complex plans or plans requiring additional coordination/information.

In signing this application, I understand that separate City and/or County and/or State permits may be required for this project. Furthermore, I am aware that I am responsible for ensuring that the project is completed in accordance with the plans and specifications as stipulated in the permit approval condition.

(APPLICANT SIGNATURE) _____ (PRINT NAME/TITLE) _____

(DATE SIGNED) _____

As a consideration for the permission granted herein, (APPLICANT) _____ agrees to indemnify and hold harmless the City of Fort Lauderdale for any damages, claims, or injuries that may result from the MOT plan approved under the PERMIT.

(NAME OF COMPANY) _____ BY: _____ (COMPANY AUTHORIZED AGENT)

Office Use Only	MOT ID#: _____ GMOT Permit#: _____

REQUIRED SIGNATURES FORM

Applicant must collect all required signatures. To expedite processing, individual signatures may be obtained and submitted to MOT@fortlauderdale.gov separately on this page. All signatures and comments must be submitted before two-week review process begins.

Print Name _____ Signature _____ **Police Department** 1300 W. Broward Boulevard | Tel: 954-828-5477 *Call for Appointment* *Required only if MOT includes a detour for any direction of travel.	_____ (Date)
Print Name _____ Signature _____ **Fire Rescue Department** 528 N.W. 2nd Street | Tel: 954-828-6864 | Email: CBotting@fortlauderdale.gov *Call for Appointment* *Required only if MOT includes a detour for any direction of travel.	_____ (Date)
Print Name _____ Signature _____ **Broward County Traffic Engineering Division** 2300 W. Commercial Boulevard | Tel: 954-847-2653 *Call for appointment. Walk-ins NOT accepted.* *Required only if MOT/detour affects Broward County road or intersection.	_____ (Date)

After all applicable signatures are collected, applicant should submit the MOT plan and this routing form to the Transportation and Mobility Department at mot@fortlauderdale.gov.

OFFICE USE ONLY

Department Director's Signature (requested by City staff if required)

Print Name _____ Signature _____ **Transportation and Mobility Department** 290 N.E. 3rd Avenue | Tel: 954- 828-4997 | Email: MOT@fortlauderdale.gov *Call for Appointment. Walk-ins NOT accepted.*	_____ (Date)
Signature _____ **Transportation and Mobility Department** Ben Rogers, Director	_____ (Date)

A copy of the final permit and this MOT form shall be kept on site and be made available to the City inspector at all times.

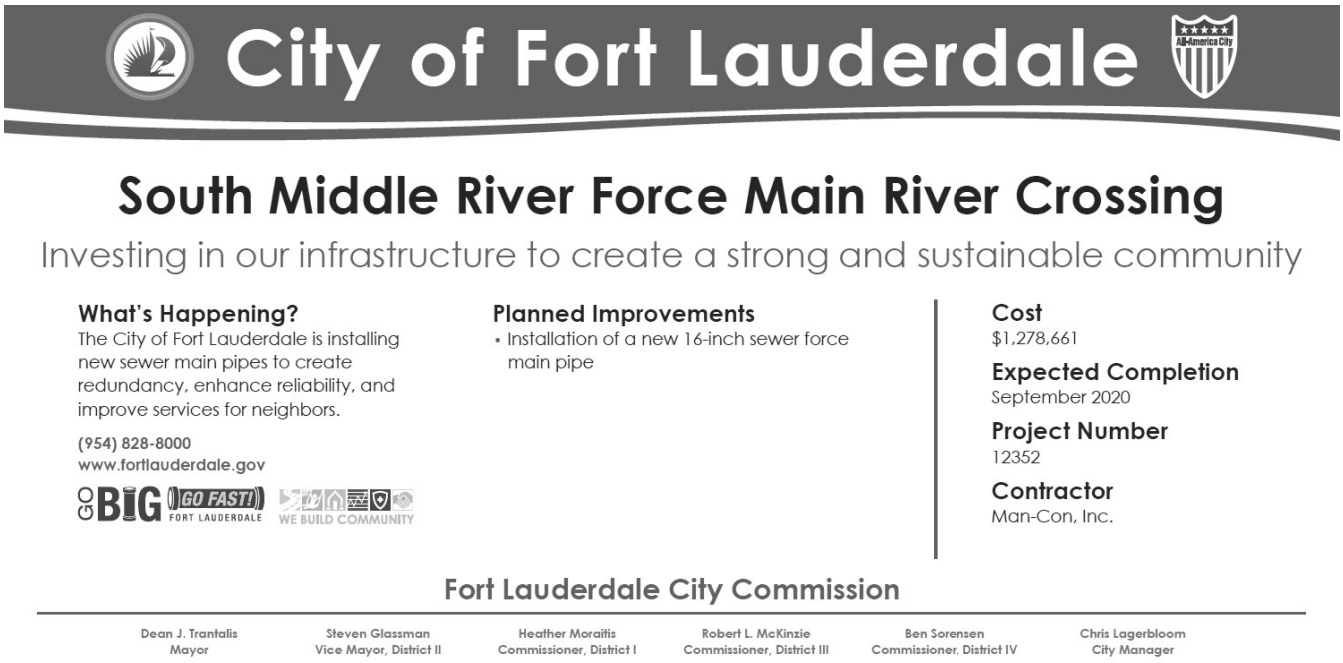
Traffic modifications required for special events shall be coordinated through the Parks and Recreation's Special Events Department. Please call 954-828-6075 or email basmith@fortlauderdale.gov.

MOT plans for City Capital Improvement Projects shall be coordinated through the City of Fort Lauderdale Public Works Department. Please call 954-828 -5772 or email ralvarez@fortlauderdale.gov.

SECTION 01590
PROJECT SIGN

PART 1 GENERAL

CONTRACTOR shall furnish and install a 4' X 8' sign (with white painted posts) prior to start of construction. A sample sign template is below but is not specific to the project. The exact style and design will be provided by the City to the CONTRACTOR during the preconstruction meeting in PDF format.



END OF SECTION

SECTION 01600
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 DEFINITIONS

A. Products:

1. New items for incorporation in the work, whether purchased by CONTRACTOR or OWNER for the project, or taken from previously purchased stock may also include existing materials or components required for reuse.

2. Includes the terms material, equipment, machinery, components, subsystem, system, hardware, software, and terms of similar intent and is not intended to change meaning of such other terms used in Contract Documents, as those terms are self-explanatory and have well recognized meanings in the construction industry.

3. Items identified by manufacturers product name including make or model designation, indicated in manufacturers published product literature that is current as of the date of the Contract Documents.

1.2 DESIGN REQUIREMENTS:

A. Provide systems, equipment, and components, including supports and anchorage in accordance with provisions of latest edition of the Florida Building Code. Wind: 150 MPH, with exposure condition and an important factor of 1.5.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Altitude: Provide materials and equipment suitable for installation and operation under rated conditions at 0-25 feet above sea level.

B. Provide equipment and devices installed outdoors or in unheated enclosures capable of continuous operation within an ambient temperature range of 30 degrees to 110 degrees F

1.4 PREPARATION FOR SHIPMENT

A. When practical, factory assembled products. Mark or tag separate parts and assemblies to facilitate field assembly. Cover machined and unpainted parts that may be damaged by the elements with strippable protective coating.

B. Package products to facilitate handling and protect from damage during shipping, handling, and storage. Mark or tag outside of each package or create to indicate its purchase order number, bill of lading number, contents by name, name of Project and CONTRACTOR, equipment number, and approximate wait. Include complete packaging list and bill of materials with each shipment.

C. Extra Materials, Special Tools, Test Equipment, and Expendables:

1. Furnish as required by individual specifications.

2. Schedule:

a. Ensure that shipment and delivery occur concurrent with shipment of associated equipment.

b. Transfer to the OWNER shall occur immediately after completion of the CONTRACTOR's work and the OWNER's acceptance of work.

3. Packaging and Shipment:

a. Package and ship extra materials and special tools to avoid damage during long term storage and original cartons insofar as possible, or an appropriately sized, hinged- cover, wood, plastic, or metal box.

b. Prominently displayed on each package, the following:

1. Manufacturer's part nomenclature and number.

2. Appliable equipment description.

3. Quantity of parts in package.

4. Equipment manufacturer.

4. Replace extra materials and special tools found to be damaged or otherwise inoperable at time of transfer to the OWNER.

D. Requesting minimum seven (7) day advanced notice of shipment from manufacturer. Upon receipt of manufacturers advanced notice of shipment, promptly notify the ENGINEER of anticipated date and place of arrival.

E. Factory test results: Reviewed and accepted by the ENGINEER before product shipment as required in individual specification sections.

1.5 DELIVERY AND INSPECTION

A. Deliver products in accordance with accepted current progress schedule and coordinate to avoid conflict with the work and conditions at site.

B. Deliver products in undamaged condition, in manufacturers original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable. Include UL labels on products so specified.

C. Unload products in accordance with manufacturer's instructions for uploading or as specified. Record receipt of products at site. Inspect for completeness and evidence of damage during shipment.

D. Remove damaged products from site and expedite delivery of identical new undamaged products, and remedy incomplete or lost products to provide that specified, so as not to delay progress of the work.

1.6 HANDELING, STORAGE AND PROTECTION

A. Handle and store products in accordance with manufacturers written instructions in a manner to prevent damage. Store in approved storage yards or sheds provided in accordance with Section 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS. Provide manufacturer's recommended maintenance during storage, installation and until products are accepted for use by the OWNER.

B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free

from damage or deterioration. Keep running account of products in storage to facility inspection into estimate progress payments for products delivered, but not installed in the work.

C. Store fabricated products above ground on blocking or skids and prevent soiling or staining. Store loose granular materials in well- drained area on solid surface to prevent mixing with foreign matter. Cover products that are subject to deterioration with impervious sheet coverings and provide adequate ventilation to avoid condensation.

D. Store finished products that are ready for installation and dry and well- ventilated areas.

E. Hazardous materials: prevent contamination of personnel, storage building, and site. Meet requirements of product specification, codes, and manufacturer's instructions.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide manufacturer's standard materials suitable for service conditions, unless otherwise specified in the individual specifications.

B. Where product specifications include a named manufacturer, with or without model number, and include performance requirements, named manufacturers products must meet the performance specifications.

C. Like items of products furnished and installed in the work shall be end products of one manufacturer and the same series or family of models to achieve standardization for appearance, operation and maintenance, spare parts and replacement and manufacturer services.

D. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.

E. Provide interchangeable components of the same manufacturer, for similar components, and less otherwise specified.

F. Equipment, components, systems, and subsystems: design and manufacture with due regard for health and safety of operation, maintenance, and accessibility, durability of parts, and shall comply with acceptable OSHA, state and local health and safety regulations.

G. Regulatory Requirement: Coding materials shall meet federal, state, and social requirements limiting the emission of volatile organic compounds and for worker exposure.

H. Safety guards: Provide for all belt or chain drives, fan blades, couplings, or other moving or Rotary parts. Cover rotating part on all sides. Design for easy installation and removal. Use 16-gauge or heavier; galvanized steel, aluminum coated steel, or galvanized or aluminum coated ½-inch mesh expanded steel. Provide galvanized steel accessories and supports, including bolts. For outdoors application, prevent entrance of rain and dripping water.

I. Provide materials and equipment listed by UL wherever standards have been established by that agency.

J. Material Finish:

1. Provide manufacturer's standard finish and color, except where specific color is indicated.

2. If manufacturer has no standard color, provide material with finish as approved by the ENGINEER.

K. Special Tools and Accessories: Furnished to the OWNER, upon acceptance of material, all accessories required to maintain normal operation of the system. These accessory items include but are not limited to, special tools and other spare parts as required for maintenance.

2.2 FABRICATION AND MANUFACTURE

A. General:

1. Manufacture Parts to USA standard sizes and gauges.
2. Two or more items of the same type shall be identical, by the same manufacturer and interchangeable.
3. Modify standard products as necessary to meet performance specifications.
4. Use 1/4-inch minimum thickness for steel that will be submerged, wholly or partially, during normal operation.

2.3 SOURCE QUALITY CONTROL

A. Where specifications call for factory testing to be witnessed by the ENGINEER, notify ENGINEER not less than fourteen (14) days prior to scheduled test date unless otherwise specified.

B. Calibration Instruments: Bear the seal of a reputable laboratory certifying instrument has been calibrated within the previous twelve (12) months to a standard endorsed by the National Institute of Standards and Technology (NIST).

C. Factory Tests: Perform in accordance with accepted test procedures and document successful completion.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect materials and equipment for signs of pitting, rust decay, or other deleterious effects of storage. Do not install material or equipment showing such effects. Remove damaged material or equipment from the site and expedite delivery of identical new material or equipment. Delays due to the work resulting from materials or equipment damage that necessitates procurement of new products will be considered delays within the CONTRACTOR's control.

3.2 INSTALLATION

A. Install work in accordance with ANSI/AWWA C-600-10 (or current edition), unless otherwise specified.

B. Handle, install, connects, clean, condition, and adjust products in accordance with manufacturer's instructions, and as may be specified. Retain a copy of manufacturers instruction at site, available for review at all times.

3.3 FIELD FINISHING

A. In accordance with individual specification sections.

END OF SECTION

SECTION 01640
MANUFACTURERS' SERVICES

PART 1 GENERAL

1.1 DEFINITATIONS

A. Person-Day: one person for eight (8) hours within regular CONTRACTOR working hours.

1.2 SUBMITTALS

A. Informational Submittals:

1. Training schedule: Submit not less than twenty-one (21) days prior to start of equipment installation and revise as necessary for acceptance.

2. Lesson Plan: Submit proposed Lesson plan not less than twenty-one (21) days prior to scheduled training and revise as necessary for acceptance.

1.3 QUALIFICATION OF MANUFACTURER'S REPRESENTATIVE

A. Authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation, and maintenance of respective equipment, subsystem, or system, with full authority by the equipment manufacturer to issue the certifications required of the manufacturer. Additional qualifications may be specified elsewhere.

B. Representative subject to acceptance by the OWNER and ENGINEER. No substitute representatives will be allowed unless prior written approval by such has been given.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 FULFILLMENT OF SPECIFIED MINAMUM SERVICES

A. Furnish manufacturer's services when required by an individual specification section, to meet the requirements of this section.

B. Where time is necessary more than that stated in the specifications for manufacturer's services, or when minimum time is not specified, the time required to perform the specified services shall be considered incidental.

C. Schedule manufacturer services to avoid conflict with other on-site testing or other manufacturer's on-site services.

D. Determine, before scheduling services, that all conditions necessary to allow successful operations and testing have been met.

E. Only those days of service approved by the ENGINEER will be credited to fulfill the specified minimum services.

F. When specified in individual specification sections, manufacturers' onsite services shall include:

1. Assistance during product (system, subsystem, or component) installation to include observation, guidance, instruction of the CONTRACTOR's assembly, erection, installation or application procedures.

2. Inspection, checking and adjustment as required for product (system, subsystem, or component) two function as warranted by manufacturer and necessary to furnish manufacturers certificate of proper installation.

3. Providing, daily, copies of all manufacturer's representatives field notes and data to the ENGINEER.

4. Revisiting the site as required to correct problems and until installation and operation are acceptable to the ENGINEER.

5. Resolution of assembly or installation problems attributable to or associated with, respective manufacturers products and systems.

6. Assistance during functional and performance testing, and facility startup and evaluation.

7. Training of the OWNER's personnel in the operation and maintenance of respective products as required.

8. Additional requirements may be specified elsewhere.

3.2 MANUFACTURER'S CERTIFICATE OF COMPLIANCE

A. When specified in individual specification section, submit prior to shipment of product or material.

B. The ENGINEER may permit use of certain materials or assemblies prior to sampling and testing if accompanied by accepted certification of compliance.

C. Signed by product manufacturer certifying that product or material specified conforms to or exceeds specification. Attached supporting reference data, affidavits, and certifications as appropriate.

D. May reflect recent or previous test results on material or product, if acceptable to the ENGINEER.

3.3 MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

A. When so specified, a manufacturer certificate of proper installation form, a copy of which is attached to this section, shall be completed, and signed by the equipment manufacturer's representative.

B. Such forms shall certify that the signing party is a duly authorized representative of the manufacturer, is empowered by the manufacturer to inspect, approve, and operate their equipment and is authorized to make recommendations required to assure that equipment is complete and operational.

3.4 TRAINING

A. General:

1. Furnish manufacturer's representatives for detailed classroom and hands-on training to the OWNER's personnel on operation and maintenance of specified product (system, subsystem, component) and as may be required in applicable specifications.
2. Furnish trained, articulate personnel to coordinate and expedite training, to be present during training coordination meetings with the OWNER, and familiar with operation and maintenance manual information.
3. Manufacturer's representative shall be familiar with facility operation and maintenance requirements as well as specified equipment.
4. Furnish complete training materials, to include operation and maintenance data, to be retained by each trainee.

B. Training Schedule:

1. List specified equipment and systems that require training services and show:

   a. Respective manufacturer.

   b. Estimated dates for installation completion.

   c. Estimated training dates.

2. Allow for multiple sessions when several shifts are involved.

3. Adjust schedule to ensure training of appropriate personnel as deemed necessary by OWNER, and to allow full participation by manufacturer's representatives. Adjust schedule for interruptions in operability of equipment.

4. Coordinate with Section 01320 CONSTRUCTION PROGRESS DOCUMENTATION.

C. Lesson Plan: When specified, prepare for each required course, containing the following minimum information:

1. Title and objectives.
2. Recommended types of attendees (e.g., managers, ENGINEERs, operators, maintenance).

3. Course description and outline of course content.

4. Format (e.g., lecture, self-study, demonstration, hands-on).

5. Instruction materials and equipment requirements.

6. Resumes of instructors providing the training.

3.5 SUPPLEMENTS

A. The supplement listed below, following "END OF SECTION," as part of this specification.

1. Supplement 1- Manufacturer's Certificate of Proper Installation

END OF SECTION

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

Owner _____ EQPT SERIAL NO:_____

EQPT TAG NO:_____ EQPT/SYSTEM:_____

PROJECT NO:_____ SPEC. SECTION:_____

I hereby certify that the above-referenced equipment/system has been:

(Check Applicable)

- ☐ Installed in accordance with Manufacturer's recommendations.
- ☐ Inspected, checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.
- ☐ All applicable safety equipment has been properly installed.
- ☐ Functional tests.
- ☐ System has been performance tested and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments:_____

_____

_____

_____

_____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwise indicated herein. I further certify that all information contained herein is true and accurate.

Date:_____, 20_____

Manufacturer:_____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

SECTION 01780
CONTRACT CLOSEOUT

PART 1 SUBSTANTIAL CLOSEOUT

1.1 The CONTRACTOR may request inspection of a portion of the work, before the entire work is ready for its intended use, if a portion of the work is a geographic area that is sustainably complete, if deemed reasonable by the OWNER and the ENGINEER. The OWNER and the ENGINEER may alternatively choose to inspect the work when the entire work is substantially complete.

1.2 When the CONTRACTOR considers the entire work ready for its intended use contractor shall notify OWNER and ENGINEER in writing, that the entire work is substantially complete (except for minor items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of substantial completion. Promptly after CONTRACTOR's notification, OWNER, CONTRACTOR and ENGINEER shall inspect the work (if the work has not yet been inspected in portions) to determine the status of completion. If OWNER and ENGINEER do not consider the work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons there for.

1.3 When OWNER and ENGINEER conclude the work is substantially complete, a certificate of substantial completion will be delivered to the CONTRACTOR, along with a list of items to be completed or corrected before final payment.

PART 2 FINAL INSPECTION

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

PART 3 FINAL PAYMENT

3.1 SUBMITTALS: Closing documents will be completed on OWNER's standard forms. Package of closing document forms and final completion checklist to be provided at the pre-construction meeting.

A. Informational Submittals:

1. Submit prior to application for final payment.
   a. Special Bonds, Special Guarantees, and Service Agreements.
   b. Consent of Surety to Final Payment.
   c. Releases or Waivers of Liens and Claims.
   d. Releases from Agreements.
   e. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01025 MEASUREMENT AND PAYMENT.
   f. Extra materials: As required by individual specification sections.

B. Subcontractor Identification Form:

1. Submit form with final pay request.
2. Submit a separate form for each subcontractor used.

3. For capital improvement projects, submit a form along with final pay request to the PROJECT MANAGER.

4. Subcontractor Identification Form is attached as a supplement to this section.

3.2 RELEASES FROM AGREEMENTS

A. Furnish OWNER written releases from property owners or public agencies where side agreements or special easements have been made, or where the CONTRACTOR's operations have not been kept within the OWNER's construction Right-of-way.

B. In the event CONTRACTOR is unable to secure Written Releases:

1. Inform ENGINEER of the reasons.

2. The OWNER or its representatives will examine the site, and the OWNER will direct the CONTRACTOR to complete the work that may be necessary to satisfy terms of the side agreement or special easement.

3. Should the CONTRACTOR refuse to perform this work, the OWNER reserves the right to have it done by separate contract and deduct cost of same from the contract price or require the CONTRACTOR to furnish a satisfactory bond in a sum to cover legal claims for damages.

4. When the OWNER is satisfied that the work has been completed in agreement with the Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if:

(i) The CONTRACTOR's failure to obtain such statement is due to grantors refusal to sign, and this refusal is not based upon any legitimate claims that the CONTRACTOR has failed to fulfill terms on site agreement or special easement, or

(ii) The CONTRACTOR is unable to contact or has had undue hardship in contracting grantor.

PART 4 PRODUCTS (NOT USED)

PART 5 EXECUTION

5.1 FINAL CLEANING

A. At completion of the work along each pipe segment clean entire site or parts thereof, as applicable.

1. Make the work in adjacent areas affected and it cleaned condition satisfactory to the OWNER and ENGINEER.

2. Broom clean affected driveways and parking/roadway areas.

3. Post clean sidewalks, loading areas and other areas continuous with limits of Construction.

4. Brake cleans all other surfaces.

B. Use only cleaning materials recommended by the manufacturer on surfaces to be cleaned.

C. Meet all requirements of Section 02575 SURFACE RESTORATION.

5.2 SUPPLEMENTS

A. The supplement listed below, following "END OF SECTION" is part of this specification.

1. Supplements-1, Subcontractor Identification Form

5.3 Contract Closeout Procedures shall be utilized to close of each task order issued under this contract.

END OF SECTION

SECTION 01780-01 – Subcontractor Identification Form - Supplement 1

SUBCONTRACTOR IDENTIFICATION FORM

This form shall be completed by all City of Fort Lauderdale prime Contractors or Consultants who subcontract out any portion of his/her City contract/agreement. The form shall be forwarded to the City of Fort Lauderdale's Public Services Department (Engineering and Architectural Services) with the prime Contractor's/Consultant's final pay request. A separate form is to be completed and submitted for each subcontractor. Please telephone (954) 828-5057 or 828-5083 if you have any questions regarding this form.

1) CITY OF FORT LAUDERDALE PROJECT NUMBER. _____

2) PROJECT DESCRIPTION_____

3) SUBCONTRACTOR_____
Business Name Address Telephone No.

4) SUBCONTRACTOR'S PRINCIPAL OFFICER_____

5) CLASSIFICATION OF WORK SUBCONTRACTED OUT_____

6) COST OF WORK SUBCONTRACTED OUT_____

7) Please check the item(s), which properly identify the ownership status of the subcontractor's firm.

( ) Subcontractor firm is not a MBE or WBE.

( ) Subcontractor firm is MBE, as at least 51 percent is owned and operated by one or more socially and economically-disadvantaged individuals.

_____ American Indian _____ Asian _____Black _____Hispanic _____White

( ) Subcontractor firm is a WBE, as at least 51 percent if owned and operated by one or more women.
_____ American Indian _____ Asian _____Black _____Hispanic _____White

8) PRIME CONTRACTOR

_____ _____
NAME & TITLE OF PRIME CONTRACTOR'S REPRESENTATIVE COMPLETING THIS FORM (Please Print) TELEPHONE NO.

SIGNATURE _____ DATE_____
PRIME CONTRACTOR'S REPRESENTATIVE

SubConIDForm/mb
Rev. 02/03

SECTION 02134
CHEMICAL GROUT

PART 1 GENERAL

1.1 REQUIREMENTS

A. The work specified in this section includes all labor, materials, accessories, equipment, and tools necessary for grouting and sealing of leaks and defective joints or cracks that may affect the installation of cured-in-place pipe liner.

B. Chemical Grouting shall conform to Section 01010, Part 3.

1.2 REFERENCES

A. Section 02765 CURED-IN-PLACE PIPE LINING

1.3 SUBMITTALS

A. The CONTRACTOR shall submit the following in accordance with Section 01300 SUBMITTALS:

1. A specimen product label showing the United States Environmental Protection Agency (EPA) registration number of the product.
2. Material Safety Data Sheets (MSDS) for the products.
3. Grout, design mix and testing reports.
4. Brand name manufacturer of the chemical grout and equipment to be used.

B. The above information data shall clearly indicate compliance with the specifications. The CONTRACTOR shall submit written exceptions to the specifications.

PART 2 PRODUCTS

2.1 CHEMICAL GROUT

A. The CONTRACTOR shall provide a chemical sealant solution containing principle chemical sealant constituent, initiator and catalyst specifically recommended for the purpose of sealing leaks in sanitary sewer lines.

B. While being injected, the chemical sealant must be able to react/perform in the presence of water (groundwater).

C. The cured material must withstand submergence in water and prolonged exposure to dry conditions without degradation.

D. The resultant sealant (grout) formation must prevent the passage of water (infiltration) through the sewer pipe joints.

E. The sealant material, after curing, must be flexible as opposed to brittle.

F. The chemical sealant shall be compatible with the CIPP resin as specified in Sections 02765 CURED-IN-PLACE PIPE LINER.

G. The chemical sealant selected by the CONTRACTOR is subject to approval by the ENGINEER and shall be AV-202 (Hydrophilic Polyurethane Grout) or an approved equal.

PART 3 EXECUTION

3.1 SEALING PIPE DETECTS AND JOINTS

A. Prior to performing chemical grouting, the CONTRACTOR shall clean the sewer in accordance with Section 02751 PREPARATORY CLEANING, ROOT AND TUBERCULATION REMOVAL.

B. In every case, mixing and handling of chemical sealing materials shall be in accordance with the manufacturer's recommendations.

C. The application of the sealing grout within the pipe shall be by means of remote-controlled equipment designed to be positioned at the specific point to be sealed and to apply the grout under sufficient pressure for the grout to pass through the opening and fill voids outside the pipe as well as the opening in the pipe wall. Review of the results shall be accomplished by operating the closed-circuit television camera conforming to requirements of Section 02752 PIPE INSPECTION (MAINS AND LATERALS).

D. Methods of sealing used shall not damage the pipe or change the pipe alignment and add the original cross-sectional area shall not be permanently reduced or changed.

3.2 FLOW CONTROL

A. Sewer service shall not be interrupted during any grouting or sealing process. In situations where it is necessary, the CONTRACTOR shall block/bypass flow in accordance with Section 02750 WASTEWATER FLOW CONTROL.

3.3 PERSONAL PROTECTIVE EQUIPMENT

A. CONTRACTOR shall use appropriate protective clothing and equipment as recommended by the manufacturer during the use and handling of the material.

END OF SECTION

SECTION 02200
SITE PREPARATION

PART 1 GENERAL

1.1 DEFINITIONS

A. Interfering for objectionable material: trash, rubbish, and junk; vegetation and other organic matter, whether alive, dead or decaying; Topsoil.

B. Clearing: removal of interfering or objectionable material lying on or protruding above the ground surface.

C. Scalping: removal of sod without removing more than upper three (3) inches of topsoil.

D. Project limits: areas, as specified within which work is to be performed.

1.2 QUALITY ASSURANCE

A. Obtain PROJECT MANAGER's approval of stake clearing, grubbing, and stripping limits, prior to commencing clearing, grubbing and stripping.

1.3 SCHEDULING AND SEQUENCING

A. Prepare site only after adequate erosion and sediment controls are in place. Limit areas exposed uncontrolled to erosion during installation of temporary erosion and sediment controls.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Clear and strip areas rated for site improvements within limits specified.

B. Property obstructions which are to remain in-place, such as buildings, sewers, drains, water or gas pipes, bridges etc., to be carefully protected from damage.

C. Do not injure or deface vegetation that is not designated for removal. All branches potentially interfering with construction operations shall be pruned prior to starting work and following approval of the PROJECT MANAGER and the City of Fort Lauderdale Urban Forester.

3.2 LIMITS

A. As follows, but not to extend beyond project limits.

1. Excavation including trenches: five (5) feet beyond top of cut slopes for shored wall.
2. Other areas: as shown.

B. Remove rubbish, trash and junk from entire area within project limits.

3.3 TEMPORARY REMOVAL OF INTERFERING PLANTINGS

A. Remove and store shrubs and trees that are not designated for removal but do interfere with construction or could be damaged by construction activities.

B. Photograph and document location, orientation, and condition of each plant prior to its removal. Records sufficient information to uniquely identify each plant removed and to assure accurate replacement.

3.4 SCALPING

A. Do not remove sod until after clearing is completed and resulting debris is removed.

B. Scalp areas within limits specified.

3.5 DISPOSAL

A. Clearing and Debris:

1. Woody debris maybe chipped. Chips may be sold to CONTRACTOR's benefit or used for landscaping on site as mulch or uniformly next with topsoil, provided that resulting mix will be fertile and not support combustion. Maximum dimensions of chipped material used on site shall be 1/4- inch by 2 inches. Dispose of chips that are not unsalable or unsuitable for landscaping or other uses with unchipped debris.

2. Limit offsite disposal of clearing and grubbing debris to locations that are approved by federal, state, and local authorities and that will not be visible from project.

B. Scalping: As specified for clearing and grubbing debris.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall be responsible for design, installation, and operation of a dewatering system to dewater specified excavations.

1. The dewatering system shall be designed in accordance with the best management practices (BMP's) adopted by FDEP.

2. Inspection and control of dewatering system operations will be in accordance with the FDEP guidelines established in the Florida Erosion and Sediment Control Inspectors Manual (current edition).

B. Continuously manage and control excavation water recharge to facilitate and not impede construction activities at all times, including weekends, holidays and during periods of work stoppages, and furnish and install, and operate, a contingency backup dewatering system to maintain control of excavation water levels to facilitate construction (i.e; no construction delays).

3.2 SUBMITTALS

A. Submittal shall be made in accordance with the requirements specified in Section 01300, SUBMITTALS, and the requirements of this Section.

B. Provide name, address, and phone numbers of all subcontractors.

C. The CONTRACTOR shall submit a Dewatering Best Management Practices (BMP) Plan prior to the start of excavation expected to include dewatering operations. The plan shall provide detailed descriptions of dewatering procedures to be utilized to meet the requirements of this section. Methodologies to control dewatering discharge contamination include but are not limited to:

1. Holding tanks of adequate size and volume.
2. Well pointing systems.
3. Sump pumping systems.
4. Chemical precipitation of particulates.
5. Filter systems and siltation controls.
6. Outfall booms.

D. The CONTRACTOR shall provide a Site Health and Safety Plan and Activity Hazard Analysis (AHA) for contaminated soil and/or groundwater as specified in this section, to include the following:

1. A written description of the proposed method for temporary stockpiling, transportation, and disposal of all wastes.

2. Copy of permits of disposal facilities.

3. Certification of disposal of all wastes.

4. Directions to the nearest hospital and phone number.

5. Emergency contact phone numbers.

6. Laboratory analysis and sampling plan required for transportation and disposal of all wastes in accordance with applicable federal, state, and local requirements.

E. Upon completion of Remediation Activities, the following shall be provided:

1. Copy of manifests for all wastes leaving the site.

2. Copy of the laboratory analysis results from all sampling activities.

3. Copy of closure reports that may be required.

3.3 SURFACE WATER CONTROL

A. Remove surface runoff controls when no longer needed.

B. Seal off or berm catch basins in construction to prevent discharge of untreated dewatering effluent or runoff from un-stabilized construction areas into storm drains.

C. All drain inlets or catch basins used for dewatering discharge shall be provided with silt and sediment removal barriers as approved by the ENGINEER.

1. All barriers shall be cleaned regularly to avoid sediment discharge into the storm drain system.

2. Construction activities will be stopped at no cost to the OWNER until sediment controls are properly maintained, installed, and in compliance with the dewatering permit.

3. All barriers shall be removed upon issuance of hurricane warning.

3.4 DEWATERING SYSTEMS

A. Design, furnish, and install, operate, and maintain a dewatering system of sufficient size and capacity to permit excavation and subsequent construction activities in water-free conditions, and to lower and maintain the excavation area groundwater level to a minimum of ~~three~~ two feet below the lowest point of excavation. The dewatering system shall be designed and operated such that the system continuously maintains excavations water levels to maintain the excavation water level in order to allow for the initiation and completion of excavation backfill compaction and restoration activities.

B. Dewatering systems shall include, but is not limited to, furnishing, and installing wells or wellpoints, and/or other equipment and appurtenances as may be necessary, including system components or equipment, installed outside the outermost perimeter of the excavation limits, and sufficiently below lowest point of excavation, to maintain the specified or required groundwater elevation.

C. Open trench pumping may be permitted upon the approval of the ENGINEER.

D. Design and Operate Dewatering Systems:

1. To prevent loss of ground as water is removed.

2. To avoid introducing settlement or damage to existing facilities, completed work for adjacent property.

3. Avoid surface water pollution or discharge of sediment to storm drain systems or waterways.

E. Provide supplemental ditches and sumps only as necessary to collect water from local seeps. Do not use ditches and sumps as primary means of dewatering. The CONTRACTOR shall not direct any flow of water over pavement surfaces. Discharge of water shall be conducted as approved by the local, state, and federal agencies and the ENGINEER.

F. Provide controls to prevent surface water from entering excavation pits, trenches, or stockpiled materials.

3.5 PIPELINES CONSTRUCTED UNDER WATER

A. If it is found that the water in a trench cannot be lowered by ordinary means, i.e., wellpoints and pumps, an alternate construction method may be proposed by the CONTRACTOR. Complete details, specifications, manufacturers descriptive literature, installation lists and any other pertinent data regarding the proposed alternate method shall be submitted as an alternate by the CONTRACTOR to the ENGINEER within five (5) calendar days of the time that the CONTRACTOR anticipates using such alternate method.

B. If the ENGINEER approves the alternate method in writing, it may be used, so as long as the work is performed in a manner which, in the opinion of the ENGINEER conforms to the method and procedure as set forth in the information supplied by the CONTRACTOR in his original application for the use of an alternate method. The ENGINEER may revoke approval of the alternate method if at any time, in his opinion, the work is not conforming to any applicable portion of these Specifications.

C. No pipeline shall be laid underwater without approval of the ENGINEER.

D. If the dewatering system is eliminated or the effort reduced, and the pipe is laid underwater, additional pipe zone material will be required as backfill to the water table elevation or to the level it was reduced to.

3.6 DISPOSAL OF WATER

A. All water generated, pumps, or removed from excavations because of excavation dewatering activities shall be collected, containerized, and managed prior to discharge and or treatment at an approved discharge point or facility, in accordance with Broward County code of regulation, sections 27-27, 27-193(a), 27-193 (b)(3)(a) and 27-196. CONTRACTOR shall secure, obtain, and pay for all necessary local, state, and federal permits, licenses, fees and/or approvals to discharge water or perform onsite or offsite treatment and disposal. Treat water collected by dewatering operations as required by regulatory agencies, prior to discharge.

B. Discharge water as permitted, and in regulatory compliance with CONTRACTOR obtained discharge permits/licenses.

1. All discharge activity shall be performed to prevent silt and sediment discharge and eliminate any soil erosion or flooding, or otherwise damage existing facilities, completed work, or adjacent property.

2. Maximum allowable turbidity of discharges to surface waters or storm drains will be ten (10) NTU's.

3. Sump discharges cannot be discharged directly to storm drains or surface waters without treatment.

C. Affected storm sewer outfalls shall be protected with floating silt booms as approved by the Broward County Department of Environmental Planning and Protection (BCDPEP) and the ENGINEER. All accumulated debris resulting from dewatering discharge collecting in the boom shall be removed daily.

D. Visible slit plumes emanating from the area around the outfalls will be considered a failure of the silt and sediment remove all measures and may result in a notice of violation issued by BCDPEP. The CONTRACTOR will be responsible for all fines associated with the violation of the dewatering permit conditions issued to the CONTRACTOR.

E. Failure to control dewatering discharge is as described above and as detailed in the Florida Erosion and Sediment Control Inspectors Manual, may result in an order to seize dewatering operations until the discharge problems are corrected. No claims will be accepted for cost or delays associated with unacceptable dewatering discharge practices.

3.7 WELL POINT REMOVAL

A. Well point holes shall be filled with sand which shall be washed into the hole.

B. Well point holes located within asphalt pavement surfaces or concrete pavements, shall be filled with sand to the subgrade. The remaining hole shall be filled with non-shrinking grout.

3.8 CONTAMINATED GROUNDWATER AND DISPOSAL REQUIREMENTS

A. If CONTRACTOR suspects, witnesses, or identifies, groundwater contamination at any time during the performance of the work, CONTRACTOR shall notify the ENGINEER immediately. Results will be obtained by the on-site mobile laboratory.

B. If analytical testing (by ENGINEER OR engineer-designated laboratory or subcontractor) documents and indicates elevated concentrations above FDEP action levels (Chapters 62-777, Florida Administrative Code) as verified by the ENGINEER, dewatering operations will be suspended until appropriate treatment and or construction measures can be implemented. CONTRACTOR shall not resume operations until notified to do so in writing by the ENGINEER and construction of the remaining sewer pipelines in that area will be installed in the wet or normal construction activities shall be resumed in other areas determined by the ENGINEER. There shall be no delay or mobilization claim associated with moving to another project area unless all other work has been completed. In addition, the local agency will be immediately notified via telephone and in writing by the ENGINEER. Dewatering activities in the area will not proceed until review of the matter with the local agency is resolved and written authorization is issued.

C. Treatment of the groundwater will include three (3) options depending on the magnitude of the contamination in the trench or as determined by the ENGINEER: Granular Activated Carbon (GAC) Treatment Vessels, Mobile Air Stripping Units, or Vacuum Truck Removal and Disposal or other method as approved by the ENGINEER. The CONTRACTOR will provide a submittal list

of all qualified groundwater remediation SUBCONTRACTOR's for GAC Vessel Treatment/Portable Air Stripping Unit and Vacuum Truck disposal including the phone numbers, contact names, and addresses prior to start of construction. The selected groundwater treatment/recycling facility for hauling contaminated groundwater shall also be identified.

D. If contaminated groundwater in the dewatering trench is encountered, the remediation operations will begin once local agency approval is obtained. Contaminated water will be disposed first into a high volume holding (FRAC) tank then treated through a GAC unit/portable air stripper or recovered into vacuum hauling trucks for disposal.

E. Effluent water from the treatment system will be analyzed by the onsite mobile laboratory to confirm that concentrations are below regulatory limits. Effluent water will then be directed to a pre-approved alternative location as determined by the local agency and/or the ENGINEER.

F. A Dewatering Plan describing the dewatering approach, groundwater monitoring, and remediation alternative is attached.

END OF SECTION

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. The CONTRACTOR shall be responsible to design, provide, and maintain shoring, sheeting, and bracing as necessary to support the sides of excavations and to prevent detrimental settlement and lateral movement of existing facilities, adjacent property and completed work.

B. Consider all available geotechnical information available when designing the excavation support system.

3.2 REMOVAL OF EXCAVATION SUPPORT

A. Remove excavation support in a manner that will maintain support as excavation is backfilled.

B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed work or adjacent property.

C. Remove excavation support in a manner that does not leave voids in the backfill.

3.3 TRENCHES

A. For trench excavation exceeding five (5) feet in depth, provide adequate safety system meeting requirements of the Operational Safety and Health Administration's (OSHA), Trench Safety Standards, 29 C.F.R., S.1926.650, Subpart P, and all subsequent revisions or updates adopted by the Department of Labor and employment security.

END OF SECTION

SECTION 02315
FILL AND BACKFILL

PART 1 GENERAL

1.1 DEFINITIONS

A. Prepared Ground Surface: ground surface after completion of required demolition, clearing and grubbing, scalping up sod, stripping of topsoil, excavation to grade, and subgrade preparation.

B. Completed Course: Course or layer that is ready for next layer or next phase of work.

C. Lift: Loose (uncompacted) layer of material.

D. Geosynthetics: Geotextiles, geogrids, or geomembranes.

E. Well-Graded:

1. A mixture of particle sizes with no specific concentration or lack thereof of one or more sizes.

2. Does not define numerical value that must be placed on coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.

3. Used to define material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids.

F. Influence Area: Area within planes select downward and outward at sixty (60)-degree angle from horizontal measured from:

1. 1-foot outside outermost edge at base of foundations or slabs.
2. 1-foot outside outermost edge at surface of roadways or shoulder.
3. 0.5-foot outside exterior at spring line of pipes or culverts.

G. Borrow Material: Material from required excavations or from designated borrow areas on or near site.

H. Selected Backfill Material: Materials available on site that ENGINEER determines to be suitable for specific use.

I. Imported Material: Materials obtained from sources off-site, suitable for specified use.

J. Structural Fill: Fill materials as required under structures, pavements, and other facilities.

K. Embankment Materials: Fill materials required to raise existing grade in areas other than under structures.

PART 2 PRODUCTS

2.1 EARTHFILL

A. Excavated material from required excavations and designated borrow sites, free from rocks larger than three (3) inches, from roots and other organic matter, ashes, cinders, trash, debris, and other deleterious materials.

B. Material containing more than 10% gravel, stones, or shale particles is unacceptable.

C. Provide imported material of equivalent quality if required to accomplish work.

2.2 GRANULAR FILL

A. Use graded aggregate base material of uniform quality throughout, substantially free from vegetable matter, shale, lumps, and clay balls, and having a Limerock Bearing Ratio Value of not less than 100.

B. Aggregate is composed of limestone, marble, or dolomite.

C. Use material retained on the No. 10 sieve composed of aggregate meeting the following requirements:

1. Soundness Loss, Sodium, Sulfate: AASHTO T 104, 15 percent.

2. Percent Wear: AASHTO T 96 (Grading A) 45 percent.

Sieve Size	**Percent by Weight Passing**
2 inch	100
1- ½ inch	95 to 100
¾ inch	65 to 100
3/8 inch	45 to 75
No. 4	35 to 60
No. 10	25 to 45
No. 50	5 to 25
No. 200	0 to 10

2.3 WATER FOR MOISTURE CONDITIONING

A. Free of hazardous or toxic contaminants, or contaminants deleterious to proper compaction.

2.4 FOUNDATION STABILIZATION ROCK

A. General: materials may be limerock, shell rock, cemented coquina, or shell-based sources approved by the department.

B. Specific Requirements for Limerock: for limerock, carbonates or calcium and magnesium shall be at least 70%. Materials having a plasticity index of more than 10 or a liquid limit greater than 40 should not be used as a stabilizer. The gradation of limerock shall be such that 97% of these materials will pass a 3-1/2inch sieve.

C. Crushed Shell: Crushed shell for this use shall be mollusk shell (i.e., oysters, mussels, clams, cemented coquina). Steamed shell will not be permitted.

1. This shell shall meet the following requirements:

a. Material having a plasticity index have more than 10 or a liquid limit greater than 40 should not be used as a stabilizer.

b. At least 97% by weight of the total material shall pass a 3-½ inch sieve and at least 50% by weight the total material shall be retained on the No. 4 sieve.

c. Not more than 20% by weight of the total material shall pass the No. 200 sieve. The determination of the percentage passing the No. 200 sieve shall be by washing only.

d. If the shell meets the above requirements without crushing, crushing will not be required.

PART 3 EXECUTION

3.1 GENERAL

A. Keep placement surfaces free of water, debris and foreign material during placement and compaction of backfill materials.

B. Place and spread fill and backfill materials in horizontal lifts of uniform thickness, in a manner that avoids segregation, and compact each lift to specify densities prior to placing succeeding lifts. Slope lifts only where necessary to conform to final grade or as necessary to keep placement surfaces drained of water.

C. During filling and backfilling, keep level of fill and backfill around each structure and buried tank even.

D. If Pipe, Conduit, Depth Bank, or Cable is to be laid within fill or backfill:

1. Fill or backfill to an elevation 2 feet above top of item to be laid.
2. Excavate trench for installation of item.
3. Install bedding, applicable, as specified in Section 02320, TRENCH BACKFILL.
4. Install item.
5. Backfill pipe zone and remaining trench, as specified in Section 02320 TRENCH BACKFILL., before resuming filling or backfilling specified in this section.

E. Tolerances:

1. Final Lines and Grades: Within a tolerance of 0.1 foot unless dimensions or grades are shown or specified otherwise.

2. Grade to establish and maintain slopes and drainage as shown. Reverse slopes are not permitted.

F. Settlement: Correct and repair any subsequent damage to structures, pavements, curbs, slabs, piping, and other facilities, caused by settlement of fill or backfill material.

3.2 BACKFILL UNDER AND AROUND STRUCTURES

A. Under Facilities: within influence area beneath structures, slabs, pavements, curbs, piping, conduits, duct banks, and other facilities, backfill with granular fill, unless otherwise shown.

Place granular fill and lifts of 6inch maximum thickness and compact each lift to a density of at least 100% of the maximum density as determined by AASHTO T99, Method C.

3.3 FILL

A. Outside influence areas beneath Structures, Pavements, Curbs, Slabs, Piping, and other facilities: Unless otherwise shown, place earth fill as follows:

1. Allow for proper thickness of topsoil where required.

2. Maximum 8-inch-thick lifts.

3. Please and compact fill across full width of embankment.

4. Compact to a density of at least 80% of the maximum density as determined by AASHTO T99, Method C.

5. For the outer layer of all fill where plant growth will be established, DO NOT COMPACT. Leave this layer in a loose condition to a minimum depth of 6 inches.

6. Dress completed embankment with allowance for topsoil, crest surfacing, and slope protection, where applicable.

3.4 SITE TESTING

A. Gradation:

1. One sample from each 1,500 tons of finished product or more as often as determined by ENGINEER, if variation in graduation is occurring, or if material appears to depart from Specifications.

2. If test results indicate material does not meet Specification requirements, terminate material placement until corrective measures are taken.

3. Remove material placed in work it does not meet Specification requirements.

B. In-Place Density Tests: in accordance with AASHTO T99, Method C. During placement of materials, test as follows:

1. Earth Fill: One test per 400 feet of pipe run.

2. Granular Fill: One test per 400 feet of pipe run.

3. Foundation Stabilization Rock: One test per lift.

3.5 REPLACING OVEREXCAVATED MATERIAL

A. Replace excavation carried below grade lines shown or established by ENGINEER as follows:

1. Beneath Footings: Granular fill

2. Beneath Fill or backfill: Same material as specified, or overlying fill for backfill.

3. Beneath slabs-on-grade: Granular fill.

4. Trenches:

a. Unauthorized Over Excavation: Either foundation stabilization rock or granular pipe base material.

b. Authorized Over Excavation: Foundation stabilization rock.

5. Permanent Cut Slopes (Where Overlying Area is not to Receive Fill or Backfill):

a. Flat to moderate steep slopes (3 to 1, Horizontal Run: Vertical Rise or Flatter): Earth Fill

b. Steep Slopes (Steeper than 3 to 1):

1. Correct over-excavation by transitioning between over-cut areas and designed slope adjoining areas, provided such cutting does not extend offsite or outside easements and Right-of-ways, or adversely impacts existing facilities, adjacent property, or completed work.

2. Backfilling over excavated area is prohibited unless, in ENGINEER's opinion, backfill will remain stable and over excavated material is replaced as compacted earth Fill.

END OF SECTION

SECTION 02316
EXCAVATION

PART 1 GENERAL

1.1 QUALITY ASSURANCE

A. Provide adequate survey control to avoid unauthorized over-excavation.

1.2 WEATHER LIMITATIONS

A. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.

1.3 SEQUENCING AND SCHEDULING

A. Clearing and Stripping: Complete applicable work specified in Section 02200, SITE PREPARATION, prior to excavating.

B. CONTRACTOR shall call the utility companies at least two (2) business days before excavation, See Section 01040, COORDINATION for each utility company phone number and contact person.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 GENERAL

A. Excavate to lines, grades, and dimensions shown and as necessary to accomplish work. Excavate to within tolerance of plus or minus 0.1 foot except where dimensions or grades are shown or specified as maximum or minimum. Allow for forms, working space, granular base, topsoil, and similar items, wherever applicable. Trim to neat lines where concrete is to be deposited against earth.

B. It shall be the CONTRACTOR's responsibility to notify business establishments and residents not less than 72 hours prior to the construction. CONTRACTOR shall, wherever necessary, provide temporary sidewalks and driveway entrances at his own expense, including safe bridges over trenches and fencing around excavations for pedestrian protection.

C. Provide adequate survey control to avoid unauthorized over-excavation. Do not over- excavate without written authorization of ENGINEER. If the CONTRACTOR excavates beyond the limits shown or specified, the CONTRACTOR shall replace such excavation at his own expense. Replace over-excavated materials as specified in Section 02315, FILL AND BACKFILL.

D. Where muck, rock, clay, or other material within the limits of excavation is unsuitable in its original position, excavate such material to the cross-sections shown or specified. Backfill with suitable material and shape to the required cross-section.

E. Remove or protect obstructions based on discussion with OWNER.

3.2 UNCLASSIFIED EXCAVATION

A. Excavation is unclassified. Complete all excavation regardless of the type, nature, or condition of the materials encountered.

3.3 TRENCH WIDTH

A. Minimum Width of Trenches:

1. Single Pipes, Conduits, or Direct-Buried Cables, and Duct Banks:

a. Less than 4-inch outside diameter or width: 18 inches.

b. Greater than 4-inch outside diameter or width: 18 inches greater than outside diameter or width of pipe, conduit, direct-buried cable, or duct bank.

2. Multiple pipes, conduits, cables, or duct banks in single trench: 18 inches greater than aggregate width of pipes, conduits, cables, duct banks, plus space between.

3. Increase trench widths by thicknesses of sheeting, if used

4. The maximum trench width shall not exceed the minimum stated width of the trench unless approved by the ENGINEER. Restoration for excavation beyond the minimum required width shall be at the CONTRACTOR's sole expense.

3.4 EMBANKMENT AND CUT SLOPES

A. Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown, with proper allowance for topsoil or slope protection, where shown.

B. Remove stones and rock that exceed 3-inch diameter and that are loose, and they roll down slope. Remove exposed roots from cut slopes.

C. Round tops of cut slopes in soil to not less than 6-foot radius, provided such rounding does not extend off-site or outside easements and Right-of-ways, or adversely impacts existing facilities, adjacent property, or completed work.

3.5 STOCKPILING EXCAVATED MATERIAL

A. Stockpile excavated material that is suitable for use as fill or backfill until material is needed.

B. Post signs indicating proposed use of material stockpiled. Post signs that are readable from all directions of approach to each stockpile. Signs should be clearly worded and readable by equipment operators from their normal seated position.

C. Confined stockpiles to within easements, rights of way, and approved work areas. Do not obstruct roads, streets, public thoroughfares, or access to fire hydrants.

D. Do not stockpile excavated material adjacent to trenches and other excavations unless excavation side slopes and excavation support systems are designated, constructed, and maintained for stockpile loads.

E. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed work, if weight of stockpiled material could induce excessive settlement.

3.6 DISPOSAL OF SPOIL

A. Dispose of excavated materials, which are unsuitable or exceed quantity needed for fill or backfill, offsite.

B. Dispose of debris resulting from removal of organic matter, trash, refuse and junk as specified

in Section 02200, SITE PREPARATION, for clearing and grubbing debris.

END OF SECTION

SECTION 02320
TRENCH BACKFILL

PART 1 GENERAL

1.01 DEFINITIONS

A. Base Rock: Granular material upon which manhole bases and other structures are placed.

B. Bedding Material: Granular material upon which pipes, conduits, cables, or duct banks are placed.

C. Imported Material: Material obtained by the Contractor from source(s) offsite.

D. Lift: Loose (uncompacted) layer of material.

E. Pipe Zone: Backfill zone that includes full trench width and extends from prepared trench bottom to an upper limit above top outside surface of pipe, conduit, cable or duct bank.

F. Prepared Trench Bottom: Graded trench bottom after excavation and installation of stabilization material, if required, but before installation of bedding material.

G. Selected Backfill Material: Material available onsite that Engineer determines to be suitable for a specific use.Well-Graded: A mixture of particle sizes that has no specific concentration or lack thereof of one or more sizes producing a material type that, when compacted, produces a strong and relatively incompressible soil mass free from detrimental voids. Well-Graded does not define any numerical value that must be placed on the coefficient of uniformity, coefficient of curvature, or other specific grain size distribution parameters.

PART 2 PRODUCTS

1.02 GEOTEXTILE

A. As specified in Section 02371, Geotextiles.

1.03 MARKING TAPE

A. Plastic:

1. Inert polyethylene, impervious to known alkalis, acids, chemical reagents, and solvents likely to be encountered in soil.
2. Thickness: Minimum 4 mils.
3. Minimum Width: 2 inches.
4. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
5. Manufacturers and Products:
    a. Reef Industries; Terra Tape.
    b. Allen; Markline.

B. Metallic:

1. Solid aluminum foil, visible on unprinted side, encased in a protective high visibility, inert polyethylene plastic jacket.
2. Foil Thickness: Minimum 5.5 mils.
3. Width: 2 inches.
4. Identifying Lettering: Minimum 1-inch high, permanent black lettering imprinted continuously over entire length.
5. Joining Clips: Tin or nickel-coated furnished by tape manufacturer.
6. Manufacturers and Products:
   a. Reef Industries; Terra "D".
   b. Allen; Detectatape.
   c. Color: In accordance with APWA Uniform Color Code for Temporary Marking of Underground Facilities.

Color[a]	Facility
Red	Electric power lines, cables, conduit, and lightning cables
Orange	Communicating alarm or signal lines, cables, or conduit
Yellow	Gas, oil, steam, petroleum, or gaseous materials
Green	Sewers and drain lines
Blue	Water, irrigation, and slurry lines
[a]As specified in ANSI Z53.1, Safety Color Code.	

1.04 TRENCH STABILIZATION MATERIAL

A. Foundation stabilization rock as specified in Section 02315, Fill and Backfill.

1.05 BEDDING MATERIAL AND PIPE ZONE MATERIAL

A. Granular fill as specified in Section 02315, Fill and Backfill.

1.06 EARTH BACKFILL

A. Earth fill as specified in Section 02315, Fill and Backfill.

PART 3 EXECUTION

1.07 TRENCH PREPARATION

A. Water Control:

1. As specified in Section 02240, dewatering.
2. Remove water in a manner that minimizes soil erosion from trench sides and bottom.
3. Provide continuous water control until trench backfill is complete.

B. Remove foreign material and backfill contaminated with foreign material that falls into trench.

C. Where the trench has been dewatered, backfilling must be done before the pumps are shut off so that the pipe will not float. Any pipe which has been displaced because of floatation will be removed and installed correctly at the Contractor's expense.

1.08 TRENCH BOTTOM

A. Firm Subgrade: Grade with hand tools, remove loose and disturbed material, and trim off high areas and ridges left by excavating bucket teeth. Allow space for bedding material if shown or specified.

B. Soft Subgrade: If subgrade is encountered that may require removal to prevent pipe settlement, notify Engineer. Engineer will determine depth of over excavation, if any, required.

1.09 TRENCH STABILIZATION MATERIAL INSTALLATION

A. Rebuild trench bottom with trench stabilization material as directed by the Engineer.

B. Place material over full width of trench in 6-inch lifts to required grade, providing allowance for bedding thickness.

C. Compact each lift to provide a firm, unyielding support for the bedding material prior to placing succeeding lifts.

1.10 BEDDING

A. Furnish granular fill or imported bedding material as directed by the Engineer.

B. Place over the full width of the prepared trench bottom in two equal lifts when the required depth exceeds 8 inches.

C. Hand grade and compact each lift to provide a firm, unyielding surface.

D. Minimum thickness from the following depths below the bottom to the spring line of the pipe are as follows, except increase depths listed by 6 inches in areas of rock excavation:

1. Pipe, 15 Inches and Smaller: 4 inches.
2. Pipe, 18 Inches to 36 Inches: 6 inches.
3. Pipe, 42 Inches and Larger: 8 inches.
4. Conduit: 3 inches.
5. Direct-Buried Cable: 3 inches.
6. Duct Banks: 3 inches.

E. Check grade and correct irregularities in bedding material. Loosen top 1 to 2 inches of compacted bedding material with a rake or by other means to provide a cushion before laying each section of pipe, conduit, direct-buried cable, or duct bank.

F. Install to form continuous and uniform support except at bell holes, if applicable, or minor disturbances resulting from removal of lifting tackle.

G. Bell or Coupling Holes: Excavate in bedding at each joint to permit proper assembly and inspection of joint and to provide uniform bearing along barrel of pipe or conduit.

1.11 BACKFILL PIPE ZONE

A. Furnish granular fill or imported bedding material as directed by the Engineer.

B. Upper Limit of Pipe Zone Shall Not Be Less Than Following:

1. Pipes:
   a. Up to 12-Inch Diameter: 6 inches above top of pipe.

b. Greater than 12-Inch Diameter: 12 inches above top of pipe, unless shown otherwise.

2. Conduit: 3 inches, unless shown otherwise.
3. Direct-Buried Cable: 3 inches, unless shown otherwise.
4. Duct Bank: 3 inches, unless shown otherwise.

C. Restrain pipe, conduit, cables, and duct banks as necessary to prevent their movement during backfill operations.

D. Place material simultaneously in lifts on both sides of pipe and, if applicable, between pipes, conduit, cables, and duct banks installed in same trench. Compact to 90 percent density as determined by AASHTO T99.

1. Pipes 10 Inches and Smaller Diameter: First lift less than or equal to 1/2 pipe diameter but not less than 3 inches.
2. Pipes Over 10-Inch Diameter: Maximum 6-inch lifts.

E. Thoroughly tamp each lift, including area under haunches, with handheld tamping bars supplemented by "walking in" and slicing material under haunches with a shovel to ensure that voids are filled before placing each succeeding lift. Compact material in pipe zone to at least 98 percent maximum density as determined by AASHTO T180.

F. After the full depth of the pipe zone material has been placed as specified, compact the material by a minimum of three passes with a vibratory plate compactor only over the area between the sides of the pipe and the trench walls. Contractor shall exercise proper care to ensure that no pipe joints will be broken, damaged, or disturbed using any compacting equipment.

G. Do not use power-driven impact compactors to compact pipe zone material.

H. Where approved by the Engineer, hydraulic compaction of the pipe zone material and granular trench backfill may be used providing density testing requirements are met. A submittal describing the method of hydraulic compaction will be required.

1.12 MARKING TAPE INSTALLATION

A. Continuously install marking tape along centerline of all buried piping, on top of last lift of pipe zone material. Coordinate with piping installation drawings.

1. Metallic Marking Tape: Install with nonmetallic piping and waterlines.
2. Plastic Marking Tape: Install with metallic piping.

1.13 BACKFILL ABOVE PIPE ZONE

A. General:

1. Process excavated material to meet specified gradation requirements.
2. Adjust moisture content as necessary to obtain specified compaction.
3. Do not allow backfill to free fall into the trench or allow heavy, sharp pieces of material to be placed as backfill until after at least 2 feet of backfill has been provided over the top of pipe.
4. Do not use power driven impact type compactors for compaction until at least 4 feet of backfill is placed over top of pipe.
5. Backfill to grade with proper allowances for topsoil, crushed rock surfacing, and pavement thicknesses, wherever applicable.
6. Backfill around structures with same class backfill as specified for adjacent trench unless otherwise shown or specified.
7. Hydraulic compaction may be allowed based upon approval by the Engineer of the Contractor's detailed compaction and testing procedures.

B. Backfill for Areas in Landscaped Areas:

1. Place in lifts not exceeding 12-inch thickness.
2. Mechanically compact each lift to a minimum of 80 percent of the maximum density prior to placing succeeding lifts.

C. Backfill for Areas Under Facilities and Pavements: Backfill trench above the pipe zone with granular backfill in lifts not exceeding 12 inches. Compact each lift to a minimum of 98 percent of the maximum density compaction as determined by AASHTO Method T180, 100% for Broward County rights of way, prior to placing succeeding lifts.

1.14 ALTERNATE METHOD OF CONSTRUCTION

A. When high water tables, porous soils or other limitations to dewatering are encountered, the Contractor may request the approval of the Engineer for an alternate method of construction.

B. Use of alternative methods shall not relieve the Contractor of the work, result in increased costs to the Owner or reductions in the quality of the work as defined by testing and acceptance requirements.

C. Removal of water requirements will be waived, and the pipe and appurtenances will be permitted to be installed underwater.

D. Excavation shall be performed in accordance with Section 02316, Excavation, to the specified limits. The excavation shall be cleared of silt and other fines.

E. Pipe bedding shall be placed from the bottom of the excavation to 6 inches above the top of the pipe. The bedding shall be granular fill as described in Section 02315 Fill and Backfill.

F. Select backfill material shall be used to backfill the trench from the top of the bedding to a level 1 foot above the standing water level in the trench. Select material shall be FDOT # 57 stone or granular fill as described in Section 02315, Fill and Backfill. This lift shall be compacted in accordance with the provisions of this Section after which the remainder of the backfill can proceed as normal.

G. If the above-described method is used, all backfill material used below the water table shall not be released into the trench until the bucket or container is less than 1 foot above the water level. Pipe bedding and pipe zone material as defined above shall not be dumped or pushed into the trench.

1.15 MAINTENANCE OF TRENCH BACKFILL

A. After each section of trench is backfilled, maintain the surface of the backfilled trench even with the adjacent ground surface until final surface restoration is completed.

B. Other Areas: Add excavated material where applicable and keep the surface of the backfilled trench level with the adjacent ground surface.

C. Water shall be applied to the unstabilized trench backfill to control dust as directed by the Engineer.

D. Placement of lime rock base course and prime coat shall occur no longer than 5 days following trench backfill or as soon thereafter as record information is available to verify that pipe inverts and slopes are acceptable.

1.16 SETTLEMENT OF BACKFILL

A. Settlement of trench backfill, or of fill or facilities constructed over trench backfill within the warranty period for the project will be considered a result of defective compaction of trench backfill.

END OF SECTION

SECTION 02575
SURFACE RESTORATION

PART 1 GENERAL

1.1 STANDARD SPECIFICATIONS

A. When referenced in this section, shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.2 INTENT

A. Specific surface restoration requirements are detailed in this and other sections.

B. For pipeline projects, the intent of these Specifications and the criteria of Section 01025, MEASUREMENT AND PAYMENT, is that the roadway, adjacent Right-of-way, and properties affected by construction activity shall be returned to their pre-existing condition, unless otherwise indicated by these Contract Documents.

1. For pipelines constructed in the Right-of-way between the sidewalk and edge of pavement, the ground service will be graded into a swale to comply with the City's standard details and provided with sod.

a. Argentine Bahia sod will be used for areas without irrigation systems, except where St. Augustine turf existed previously.

b. St. Augustine "Floratam" sod will be used for areas with irrigation systems and in locations with similar, existing turf.

2. Driveways and sidewalks will be placed in kind, using similar materials of construction.

3. Trees, shrubs, and personal property (e.g., mailboxes) located in the swale area shall be relocated or replaced in kind, in accordance with the provisions of these Specifications.

C. For work areas disturbed by the CONTRACTOR for convenience, the area affected shall be restored in kind.

1. The costs of this restoration shall be incidental to the cost of the work.

2. Payment for restoration outside the limits of work should be repaired at the CONTRACTOR's expense unless performed specifically at the request of the OWNER.

1.3 WORK INCLUDED

A. This section covers the work necessary to replace all pavement, curbs, sidewalks, rock surfacing, and other street features damaged either directly or indirectly by the operations incidental to the construction described in other sections of these Specifications.

B. Where the materials, construction procedures, degree of compaction of materials, and the method of control and testing, as required in these Specifications differ from the Standard Specifications requirements, the more stringent requirements shall apply.

C. Provide furnished gradation and grassing for all areas directly or indirectly disturbed by lining

activities.

1.4 OPTIMUM MOISTURE CONTENT

A. "Optimum Moisture Content" shall be determined by the ASTM standard specified to determine the maximum dry density for relative compaction. Field moisture content shall be determined based on the fraction passing the ¾-inch sieve.

1.5 TEMPORARY TRENCH REPAIR OR STABILIZATION

A. Following the pipe installation and prior to permanent trench repair or asphalt replacement, temporary trench repair will be defined as one of the following:

1. Installation of flowable fill as described in this Section and FDOT Standard Specifications.

2. Installation of the compacted base course and prime coat as described in this Section.

PART 2 PRODUCTS

2.1 GENERAL

A. All materials for replacement of existing base course and asphalt surfacing shall conform to the standard Specifications except as modified herein.

B. The CONTRACTOR will be responsible for furnishing satisfactory materials that meet the Specifications and shall provide such tests during the work as are necessary to assure that the quality of the material used meets the Specifications.

2.2 LIME ROCK BASE COURSE

A. Aggregate quality and gradation shall meet the requirements of Section 911 of the Standard Specifications

2.3 BITUMINOUS PRIME AND TACKCOAT

A. Prime Coat: Material shall be cut back asphalt, Grade RC-70 or RC-250 meeting the requirements of Section 916-2 of the Standard Specifications or approved equal.

B. Tack Coat: Material shall be emulsifying asphalt Grade RS-2, SS-1, or SS-1H meeting the requirements of Section 916-4 of the Standard Specifications.

2.4 ASPHALT CONCRETE

A. The asphalt concrete for trench leveling, restoration and overlay shall be type S-lll or SP- 9.5 (coarse), meeting the requirements of section 334 of the Standard Specifications.

B. Aggregate: the aggregate shall meet the requirements of section 334 of the Standard Specifications.

C. Submit test results from commercial testing laboratories to the ENGINEER to show that the materials meet the quality and gradation requirements.

2.5 FLOWABLE FILL

A. Provide flowable fill with a mixed design meeting the requirements of Section 121 of the FDOT Standard Specifications for excavatable, flowable fill. Flowable fill may be allowed as substitute for compacted based upon approval of the ENGINEER, at no additional cost.

2.6 CONCRETE

A. Concrete shall be 3,000 PSI minimum concentrate meaning the requirements of Section 345 of the Standard Specifications.

B. Concrete Forms: All forms for curbs and sidewalks shall be either 2-inch dimensioned lumber, plywood, or metal forms. Forms on the face of the curve shall have no horizontal form joints within 7 inches of the top of the curb.

C. Curing Compound: Meeting the requirements of Section 925 of the Standard Specifications.

D. Reinforcing Steel: conform to ASTM A615, Grade 60.

2.7 TRAFFIC MARKINGS

A. All traffic striping markings (i.e., lane, edge of pavement, directional, informational, etc.) Damaged by the CONTRACTOR during construction shall be replaced with new painted items in meeting the requirements of Section 971 of the Standard Specifications.

B. Raised reflective pavement markers (rpm's) damaged by the CONTRACTOR during construction shall be replaced with new rpm's meeting the requirements of Section 706 of the Standard Specifications.

C. The CONTRACTOR shall place and maintain temporary striping markings throughout the course of the work until the permanent striping making is placed on the final roadway surface.

D. The CONTRACTOR shall provide painted traffic stripping at all intersections including stop bars in crosswalks as required whether they are currently stripped or not. It shall be the CONTRACTOR's responsibility to take a complete inventory and provide the appropriate permanent stripping after the completion of the work.

2.8 SWALE STABILZATION

A. Materials used for stabilization of swale areas shall consist of suitable access existing base material removed from trenching operations, if approved by the ENGINEER, crushed lime rock, rock screenings, or other suitable material as approved by the ENGINEER.

1. Materials having a plasticity index of more than 10, or a liquid limit greater than 40 shall not be used.

2. Maximum dimensions shall not exceed 1.5 inches.

PART 3 EXECUTION

3.1 CONSTRUCTION PROCEDURE

A. The ENGINEER reserves the right to vary the type of resurfacing as best serves the interest of the OWNER. Trench backfill shall be specified in Section 02315 FILL AND BACKFILL.

B. Replace all bituminous and concrete roadway pavement damaged or removed under this Contract with asphalt concrete regardless of original type. Pavement thickness shall be in accordance with the City's standard details.

C. In addition to the requirements set forth herein, the work shall conform to the applicable workmanship requirements of the state and county highway or municipal specifications.

D. Water to control dust shall be used as directed by the ENGINEER until the trench repair has been stabilized.

E. Base course and prime coat shall be installed to provide temporary trench stabilization within five (5) working days of trench backfill or as soon thereafter the as-built conditions and pipe slopes have been verified.

F. Final, permanent trench repair, and paving shall be installed within three (3) weeks of pipe verification and temporary trench stabilization, unless global fill is used for temporary trench repair, in accordance with the provisions of this Section.

3.2 CUTTING EXISTING PAVEMENT

A. Where new pavement abuts existing pavement, the old pavement shall be trimmed by saw cutting to a straight line. Any pavement which has been damaged, or which has broken and unsound shall be removed to provide a smooth, sound edge for joining new pavement.

3.3 STREET MAINTENANCE

A. Maintain all trenches as specified under Section 02316, EXCAVATION.

3.4 CONSTRUCTION OF BASE COURSE

A. Base course shall be constructed in accordance with Section 200 of the standard Specifications.

B. Compact based materials to a minimum of 98% of the maximum density as determined by AASHTO T180. Corrections for oversized material may be applied to either the as- compacted field dry density or the maximum dry density, as determined by the ENGINEER. Where the base is constructed in more than one course, the density should be obtained in each lift.

C. Alternatively, at no additional cost and with the approval of the ENGINEER, the CONTRACTOR shall provide a minimum 10 inches of 250 PSI flowable fill. The flowable fill shall be placed up to 1 1/2 inches from the top of the existing pavement. Flowable fill installed in accordance with this provision shall comply with temporary pavement restoration provisions.

3.5 MILLING OR GRINDING OF EXISTING ASPHALT PAVEMENT

A. Milling of existing asphalt pavement shall meet the requirements of Section 327 of the standard Specifications.

B. Milling shall be used to lower the grade of adjacent existing asphalt prior to trench repair to completely remove existing asphalt.

C. Milled and ground asphalt can be mixed for use with the lime rock base course material.

3.6 BITUMINOUS PRIME AND TACKCOAT

A. The bituminous prime coat shall be applied to the limerock base immediately following the placement of the compacted base course. The prime coat shall be maintained with additional coats as determined by the ENGINEER as temporary restoration until the final asphalt surface is installed. Additional prime coats will be provided at no cost to the OWNER.

B. The lime rock base shall be hard planed with a blade greater immediately prior to application of the prime code.

C. The rate of application of the bituminous prime coat shall meet the requirements of Section 916-2 of the Standard Specifications.

D. The bituminous tack coat shall be applied to existing asphalt surfaces prior to the placement of new asphalt, between the layers of asphalt concrete surface courses, surfaces of concrete footings that will meet the asphalt concrete pavement, and vertical faces of all longitudinal and transverse joints that have become compacted or cooled.

E. The rate of application for the bituminous tack coat shall meet the requirements of Section 916-4 of the Standard Specifications.

3.7 ASPHALT CONCRETE PAVEMENT REPLACEMENT

A. Preparing for Paving:

1. A prime coat shall be applied over the full length of the roadway, and asphalt concrete pavement shall not be pleased until the prime coat has cured as per the manufacturer's recommendations.
2. Should any holes, brakes, or irregularities develop in the roadway surface after the prime coat has been applied, they shall be patched with asphalt concrete immediately in advance of placing the asphalt concrete.
3. After the maintenance, patching, or repair work has been completed and immediately prior to placing the asphalt concrete pavement, the surface of the prime coat shall be swept clean of all dirt, dust, or other foreign matter.

B. The proposed pavement reconstruction schedule consists of immediately paving over trenches as soon as possible after it has been deemed that subbase and base have achieved required compaction. The base course will comply with the City's standard details and asphalt placed to bring grade up to match existing pavement elevations.

C. For deep excavations where the pavement repair constitutes a full lane or roadway, workmanship shall conform to the standards and details of new roadway construction.

1. Existing pavement less than 2-foot wide shall be removed or milled for base material.
2. Full lane or with roadways shall have a consistent cross-section and straight edge of pavement delineations.

3.8 CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT OVERLAY- IF REQUIRED

A. The CONTRACTOR shall place a layer of tack coat at the rate of 0.05 to 0.12 gallon per square yard overall areas to receive asphalt concrete.

B. Lay asphalt concrete over all areas designated to be resurfaced. The asphalt concrete pavement overlay should be placed in two (2) 3/4 - inch lifts to a compacted depth of 1 ½-inches or as needed to comply with the City's Standard Details. The method of proportioning, mixing, transporting, laying, processing, rolling the material, and the standard the workmanship shall meet the applicable requirements of sections 320, 330, and 331 add the standard Specifications period at no time should the coarse aggregate segregated from the mix either from hand spreading or raking of joints be scattered across the paved mat. Such material shall be collected and disposed of.

C. The ENGINEER will examine the prepared roadway before the paving is begun and bring any deficiencies to the CONTRACTOR’s attention to be corrected before the paving is started. Roll

each lift of the asphalt concrete until roller marks are eliminated and compacted to 100% of the laboratory compacted mixture. The grade, line, and cross section of the finished surface shall comply with the City's Standard Details. Asphalt or asphalt strains which are noticeable upon surfaces of concrete or materials which will be exposed to view shall be promptly and completely removed.

3.9 ASPHALT CONCRETE PAVEMENT

A. Workmanship in producing, hauling, placing, compacting, and finishing asphalt concrete shall meet the applicable portions of the Standard Specifications.

3.10 CONNECTIONS WITH EXISTING FACILTIES

A. Where the bituminous pavement is to relate to an existing roadway surface or other facility, the CONTRACTOR will be required to modify the existing roadway profile in such a manner as to produce a smooth riding connection to the existing facility. The CONTRACTOR shall meet existing neat lines where required.

B. Where it is necessary to remove existing asphalt surfaces or oil matte surfaces to provide proper meet lines and riding surfaces, the CONTRACTOR shall saw cut the existing surface so that there will be sufficient depth to provide a minimum of 1-inch of asphalt concrete, and the waste material shall be disposed of to the satisfaction of the ENGINEER. Prior to placing the asphalt concrete, these areas shall be tacked. Meet lines shall be straight and edges vertical. The edges of meet line cuts shall be painted with liquid asphalt or emulsify asphalt prior to placing asphalt concrete. After placing the asphalt concrete, the meet line shall be sealed by painting with a liquid asphalt or emulsify asphalt and immediately covered with clean, dry sand.

3.11 CONSTRUCTION OF COURSES

A. The asphalt concrete pavement shall be constructed in one or more courses to comply with the City's standard details.

1. Rolling shall continue until all roller marks are eliminated and compacted to 100% of the laboratory compacted mixture has been obtained.

3.12 SURFACE TOLLERANCE

A. Test for conformity with the specified grade shall be made by the CONTRACTOR immediately after initial compression. Any variation shall be immediately corrected by the removal or addition of materials and by continuous rolling.

B. The completed surface of the pavement shall be of uniform texture, smooth uniform as to grade, and free from defects of all kinds. The completed surface shall not very more than 1/8 inch from the lower edge of a 12-foot straight edge placed on the surface along the centerline or across the trench.

C. After completion of the final rolling, the smoothness and grade of the surface shall be again tested by the CONTRACTOR.

D. When deviations and access of the above tolerances are found, the pavement surface shall be corrected as stated in section 330-12.4 of the Standard Specifications.

E. All areas in which the surface of the completed pavement deviates more than twice the allowable tolerances described above shall be removed and replaced to the satisfaction of the

ENGINEER.

F. All costs involved in making the corrections of defects described above shall be borne by the CONTRACTOR and no compensation will be made for this work.

3.13 SAMPLES

A. If directed by the ENGINEER, the CONTRACTOR shall without additional charge, provide the ENGINEER with test results of samples of asphalt concrete cut from the completed pavement or the individual courses thereof for each occurrence. Provide minimum of three (3) test scores located as directly by the ENGINEER. He shall also provide the ENGINEER with the test results of the samples of the uncompressed asphalt concrete mixtures and all materials incorporated in the work.

3.14 WEATHER CONDITIONS

A. Asphalt shall not be applied to wet material. Asphalt shall not be applied during rainfall or any imminent storms that might adversely affect the construction. The ENGINEER will determine when surfaces and materials are dry enough to proceed with construction. Asphalt concrete should not be placed during heavy rainfall or when the surface upon which it is to be placed is wet.

3.15 PROTECTION OF STRUCTURES AND ADJUSTMENT APPURTENANCES

A. Provide whatever protective coverings may be necessary to protect the exposed portions of bridges, culverts, curbs, gutters, posts, guard fences, Road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations.

B. Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within the area to be surfaced, the CONTRACTOR shall adjust the tops of these facilities to conform with the proposed surface elevations. The CONTRACTOR shall notify the proper authority and either raise or lower the appurtenances to decide with that authority for having the facilities altered at the CONTRACTOR's expense before proceeding with the resurfacing. The CONTRACTOR will be responsible for making certain that appurtenances are brought to proper grade to conform with finished surface elevations and any delays experienced from such obstructions will be considered as incidental to the paving operation. No additional payment will be made. Protect all coverings using asphalt application. All adjustments shall be made in accordance with the requirements of the respective utility.

3.16 EXCESS MATERIALS

A. Dispose of all excess materials. Plan for the disposal and bear all costs or retain any profit incidental to such disposal.

3.17 CONTRACTOR'S RESPONSIBILITY

A. Settlement of replacement pavement over trenches within the warranty period shall be considered the results of improper or inadequate compaction of the subbase or base materials. The CONTRACTOR shall promptly repair all pavement deficiencies noted during the warranty period at the CONTRACTOR's sole expense.

3.18 SIDEWALKS AND CURBS

A. Replace concrete sidewalks and curbs to the same section width, depth, line, and grade that was removed or damaged. The minimum thickness of sidewalks shall be 4 inches and 6 inches

in driveways. Cut ends of existing curb to a vertical plane. Prior to replacing the sections, properly backfill and compact the trench to prevent subsequent settlement.

B. Replace concrete sidewalks at score joints and make replacement in the manner that will avoid a patched appearance. Provide a minimum 2-inch-thick compacted leveling course of clean sand or gravel of quality herein before specified. Finished concrete surface like the adjacent sidewalks.

3.19 DRIVEWAYS AND WALKS

A. Replace asphalt driveways and walks in accordance with paragraph ASPHALT CONCRETE PAVEMENT REPLACEMENT.

B. Replace concrete and paver driveways in kind, using similar in materials of construction. Concrete driveways shall consist of a reinforced 6-inch section.

3.20 PAINTING TRAFFIC STRIPES

A. All areas having traffic stripes prior to paving shall be repainted. Temporary traffic painting shall be applied immediately after asphalt pavement has been placed. Permanent traffic painting may be applied only after the proper curing time for the asphalt. Painting traffic stripes (temporary and permanent) shall meet the requirements of Section 710 of the Standard Specifications.

3.21 INSTALLATION OF RAISED REFLECTIVE PAVEMENT MARKERS

A. All areas having raised reflective pavement markers prior to paving should be replaced. Temporary pavement markers shall be applied immediately after asphalt pavement has been placed. Permanent pavement markers may be applied only after the proper curing time for the asphalt. Pavement markers and adhesive (temporary and permanent) shall meet the requirements of Section 706 of the Standard Specifications.

B. Spacing: as shown in the Roadway and Traffic Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System by the State of Florida, Department of Transportation, current edition.

3.22 PAVEMENT REPAIR

A. All damage to pavement because of work under this contract shall be repaired in a manner satisfactory to the ENGINEER and at no additional cost to the OWNER. The repair shall include preparation of the subgrade, placing and compaction of the limerock base and placement of the final asphalt surface as described in this section.

B. The width of all repairs shall extend at least twelve (12) inches beyond the limit of the damage with the edge of pavement left saw cut to a true edge with no irregularities. For county roads and city streets recently constructed or overlaid, the repair may be required to be full-lane width if specified.

3.23 SWALE RESTORATION

A. Swale areas (areas between pavement edge and sidewalks, or Right-of-way line if there is no existing or proposed sidewalk) shall be graded and restored to the pre- existing condition. Where storm inlets are present, the Swale shall have a consistent longitudinal slope towards the inlet.

B. Swale areas with previously existing improved services, including but not limited to asphalt,

concrete, pavers, crushed or decorative rock shall be restored in kind. Asphalt paved areas shall be constructed with a minimum 6-inch stabilized subbase and minimum 6-inch compacted limerock base, primed and topped with a minimum 1-inch asphalt.

C. Swell areas with previously unimproved or turfed surfaces will be restored with soil stabilization where existing natural soil will not support vehicle loads normally imposed by movement and parking of heavy vehicles without running and shifting of soil. Subject to the approval of the ENGINEER, this work may be performed in connection with preparation of subgrade or construction of the limerock base course.

D. Swale areas with previously unimproved or turfed surfaces will be topped with sod. St. Augustine "Floratam" and two (2) inches of topsoil shall be used in irrigated areas where St. Augustine sod was previously established. Bahia Sod shall be placed in all other areas not previously improved or sodded.

3.24 SWALE STABILZATION

A. Where swale stabilization is required as indicated above, stabilization shall be achieved by the addition and mixing in of suitable stabilizing materials. It shall be incorporated into the existing swale soils by plowing, disking, harrowing, blading, or mixing with rotary tillers or other appropriate equipment approved by the ENGINEER, and still the mixed materials are of uniform bearing value throughout the width and at least 6-inch depth from the top of the swale after the swale is graded and shaped into the section indicated on the plans.

B. the Swale areas shall be mixed and compacted to achieve the minimum average dry density of 90% throughout the 6-inch thickness, as determined by AASHTO T180. In the determination of such average, the minimum acceptable density shall be 85% and the maximum density which shall be used in calculations shall be 100% (if the tested density is reported above 100%).

C. Density tests for swale stabilization shall be made at intervals not less than one set of three per city block on each side of the roadway, or at increased intervals as directed by the ENGINEER when required to measure small or isolated sections (except where such testing may be considered unnecessary by the ENGINEER). Each set of three shall be averaged as indicated above for determination of meeting the minimum requirements.

3.25 BRICK OR PAVER RESTORATION

A. Remove and salvage bricks or paver materials to be disturbed by the work. Payment will be made in accordance with the unit price for these items.

B. Restoration of pavers and apron area shall comply with the City's Standard Details. Payment will be made in accordance with the unit price for these items.

C. Paver and apron areas shall be restored to at least pre- existing conditions.

D. If brick and paver materials are damaged, new materials shall match or all materials within the crossing must be replaced at no additional cost. New materials shall be approved by the OWNER.

END OF SECTION

SECTION 02632
STORM DRAIN AND SANITARY SEWER PIPING

PART 1 GENERAL

1.1 DELIVERY, STORAGE AND HANDELING

A. The storage of pipe at the project site shall be done in accordance with the pipe manufacturer's recommendations and with the approval of the PROJECT MANAGER.

B. Marking at Plant: Mark each pipe and fitting at plant. Include date of manufacture, manufacturer's identification, specification standard, diameter of pipe, pipe class and other information required for type of pipe.

C. Pipe, specials, and fittings received at project site in damaged condition will not be accepted.

D. Pipe and fittings shall not be stored on rocks or gravel or other hard material that might damage pipe. This includes storage area and a long pipe trench.

E. Gasket Storage: Store rubber gaskets and cool, well-ventilated place and do not expose to direct rays of sun. Do not allow contact with oils, fuels, petroleum, or solvents.

F. Handling:

1. Pipe should be protected during handling against impact, shock and falling.

2. Heavy canvas or nylon slings of suitable strength shall be used for lifting and supporting materials. Do not use chains or cables.

3. Lifting pipe during unloading or lifting into trench shall be done using two (2) slings placed at quarter point of pipe section. Pipe may be lifted using one (1) sling near the center of pipe, provided the pipe is guided to prevent uncontrolled swinging and no damage will result to pipe or harm to Workmen. Slings shall bear uniformly against pipe.

PART 2 PRODUCTS

2.1 PIPE AND FITTINGS

A. As specified on the Data Sheets located at the end of this section as a supplement.

B. Damaged storm drain piping shall be replaced with the same size piping using materials as specified in this section.

2.2 JOINTS

A. As specified on the Data Sheets located at the end of this section as a supplement.

2.3 SERVICE AND DRAIN CONNECTIONS

A. Pipe and fittings for individual service connection shall be one type of material throughout. No interchanging of pipe and fittings allowed. Long- radius bends shall be used for changes in directions, unless approved otherwise by ENGINEER.

B. All sewer service connections shall be SDR 35 PVC.

C. Residential Service: 6-inch.

D. Commercial Service, including motel and apartments: 8-inch, unless shown otherwise.

E. Cleanouts and Covers:

1. To be installed per the City's standard details.

2. Concrete color to surround cleanouts in unpaved areas.

3. Cast iron valve box required for installation in both paved and non-paved areas, USF 7615 (FC); or equal.

2.4 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Granular material as specified in Section 02320, TRENCH BACKFILL.

PART 3 EXECUTION

3.1 GENERAL

A. Notify PROJECT MANAGER at least two (2) weeks prior to field fabrication of pipe or fittings.

B. Furnish feeler gauges to proper size, type, and shape for use during installation for each type of pipe furnished.

C. Distributing Materials: Place materials along trench only as will be used each day, unless otherwise approved by PROJECT MANAGER. Placement of materials shall not be hazardous to traffic or to public, obstruct access to adjacent property, or obstruct others from working in area.

3.2 PRE-DIGGING AND RELOCATIONS OF WATER MAIN

A. The CONTRACTOR is responsible to relocate and protect water mains that are within the construction limits of sewers, manholes, laterals, and appurtenances. Watermains called out in the contract documents were located based on record drawing in general installation procedures. In certain instances, it may be necessary to relocate the water main horizontally or vertically because the actual location is too close to the structure or conflicts with the new sewer main.

B. At some locations the pre-digging of water main is called out in the contract documents. However, some water mains may not have been relocated because of information gathered during the CONTRACTOR’s excavation for the new sewers.

C. In both instances, CONTRACTOR is to expose the water main and provide the invert elevation and physical dimensions of the water main and adjacent structures to the ENGINEER. After review of the information, the ENGINEER will direct the CONTRACTOR how to proceed with the relocation.

D. When the CONTRACTOR is directed to relocate the water main it shall be accomplished by installing four (4) 45-degree bends, two (2) solid sleeves, and approximately 30 feet of PVC or DI pipe, depending on the existing material.

1. The complete installation shall have all reinstated joints including the connections to the existing pipe.

E. The CONTRACTOR may request a pre-dig and payment will be made only if the ENGINEER agrees that the situation justifies the need.

F. In the instance where the CONTRACTOR does not pre-dig, but the ENGINEER decides that the water main should be relocated, payment will be made only for the relocation.

G. In the instance where the CONTRACTOR does pre-dig, but the actual information reveals to the ENGINEER that the water main should not be relocated, payment will be made only for the pre-digging.

H. Only water mains two (2) inches and larger will be considered for payment. Water mains and services smaller than two (2) inches in diameter shall be considered incidental to the installation of the new sewers and will be relocated at the sole cost of the CONTRACTOR.

3.3 EXAMINATION

A. Verify size, material, joint types, elevation, and horizontal location of existing pipeline to be connected to new pipeline or new equipment.

B. Damaged Coatings and Linings: Repair using coding and lining materials in accordance with manufacturer's instructions.

C. Repairs to Reinforced Concrete Pipe section will be allowed, only if approved in writing by PROJECT MANAGER. Damaged pipe which, in opinion of ENGINEER, cannot be repaired, will be rejected, and removed from the project site.

3.4 EXCAVATION

A. Excavate pipe trenches all specified in Section 02316, EXCAVATION.

B. The amount of trench length permitted to be open at one time shall not exceed more than 400 feet of the pipelaying operations, unless approved by the ENGINEER.

C. Place and compact bedding material as specified in Section 02320, TRENCH BACKFILL.

3.5 PIPE PREPARATION AND HANDLING

A. Pipe Distribution: Do not distribute more than one (1) week's supply of materials in advance of laying, unless otherwise approved by PROJECT MANAGER.

B. Inspect all pipe and fittings prior to lowering into trench to ensure no cracks, broken, or otherwise defective materials are being used.

C. Clean ends of pipe thoroughly. Remove foreign material and dirt from inside of the pipe and keep clean during and after laying.

D. Use proper implements, tools, and facilities for the safe and proper protection of the work.

E. Lower pipe into the trench in such a manner as to avoid any physical damage to the pipe. Remove all damaged pipe from the job site. Do not drop or dump pipe into trenches under any circumstances.

3.6 INSTALLATION OF PIPE, FITTINGS AND APPURTENANCES

A. General:

1. Keep trench dry until pipelining and joining are completed. Take precautions to prevent "uplift" or floating of pipe prior to completion of backfill operation. If the excavation cannot be effectively dewatered the CONTRACTOR shall propose alternate pipe installation methodology for approval by the ENGINEER prior to proceeding. All requirements of Section 02320, TRENCH BACKFILL, will remain in effect.

2. Pipelaying shall proceed upgrade with spigot ends pointing in direction of flow.

3. When field cutting more machining pipe is necessary, use only tools and methods recommended by pipe manufacturer and approved by ENGINEER.

4. Excavate bell holes at each joint to permit correct assembly and inspection of entire joint.

5. Pipe shall be laid accurately to line and grade. Establish line and grade for pipe by use of lasers. Check for alignment and grade after joint has been made.

6. Measure for grade at pipe invert, not at top of pipe.

7. Pipe invert may deviate from line or grade up to ½- inch for line and ¼- inch for grade, provided that the finished pipeline will present a uniform bore, and such variation does not result in a level or reverse sloping invert, or less than a minimum slope shown. As-built information will be collected daily as provided in Section 01040, COORDINATION. Pipe runs with less than the required slope will be required to be removed and replaced at the CONTRACTOR's expense.

8. Pipe bedding shall form a continuous and uniform bearing and support for the pipe barrel between joints. Pipe shall not rest directly on the bell or pipe joint.

9. Prevent entry of foreign material into gasketed joints.

10. Use gasket lubricant as recommended by gasket manufacturer. Assemble joint in accordance with recommendations of manufacturer.

11. No pipe shall be laid until the two preceding lines have been thoroughly embedded in-place, to prevent movement or disturbance of the pipe.

12. Apply sufficient pressure in making joint to assure that the joint is "home" as defined in standard installation instructions provided by a pipe manufacturer. Inside joint space shall not exceed 50% of pipe manufacturers recommended maximum allowance.

13. Whenever the pipe laying is discontinued, as at night, the unfinished end is to be securely protected from displacement by laying of the banks or from other injury, and a suitable stopper is to be inserted into the pipe end to prevent clogging of the pipe.

14. Plug or close off pipes which are stubbed off for manhole, concrete structure, or for connection by others, with temporary watertight plugs.

15. Connections between one pipe material and another shall be by means of flexible compression collar, installed in accordance with the manufacturer's recommendations,

or concrete closure collar. For gravity sewer pipes SRC stainless sheer rings must be used as manufactured by Fernco or approved equal, installed in accordance with manufacturer's recommendations.

B. Connection to Structure or Manhole

1. Locate standard pipe joint within 1.5 feet outside face of structure for pipe 18 inches and smaller and within one pipe diameter for pipe 21 inches and larger.

2. Connect PVC pipe to manhole or structure with pipe to manhole connector in accordance with manufacturer's recommendations. Connections to existing manholes shall be made by core drilling the new penetration into the manhole and providing an NPC Kor-N-Seal or approved equal pipe to manhole connecter to produce a watertight seal. The use of impact tools to form new penetrations is prohibited. Connection to existing manholes shall be made in a workmanlike manner, shall be watertight and have smooth flow surfaces and curves. The invert shall be brought into the existing manhole at the elevation shown on the Drawings. The downstream pipe in manholes shall be screened to prevent entry of mortar or other debris from entering the system. Where a connection is made to an existing sanitary sewer manhole, the base shall be broken out if necessary to form a smooth channel in accordance with the construction requirements of a new manhole.

C. Crossing Waterlines: Where sanitary sewer crosses less than 18 inches below waterline, use ductile iron or PVC pressure pipe for crossing or encase in concrete envelope for a minimum distance of nine (9) feet on each side of water line.

D. Concrete Closure Collars: only use concrete closure collars where shown or authorized by ENGINEER.

E. Service Connections:

1. Minimum slope: 1/8- inch per foot.

2. Minimum Trench Depth: Three (3) feet at property line or on property within permanent sewer easement. ENGINEER will determine required depth at end of line in each case.

3. Progress of Construction: Unless otherwise approved by PROJECT MANAGER, install service connections not more than five (5) days after backfilling of sewer.

4. Service Connection Tees or Wyes: furnish tee or wye outlets with gasketed type joint or approved adapter to join service connection type. Concrete encased tees or wye deeper than 12 feet. Do not encase joints at ends of tee or wye fittings.

5. Disconnecting and Reconnecting Existing Service Connections:

a. Locate the existing service connections prior to constructing the tee in the new sewer line.

b. First length of pipe out from tee on lateral or main should not be greater than three (3) feet in length.

c. Maximum deflection permissible with anyone fitting shall not exceed 45 degrees and shall be accomplished with long-radius curves or bends. Short-

radius elbows or curves will not be permitted, except by permission of ENGINEER.

d. Disconnect existing service connections from existing sewers to be abandoned and reconnect them to the new sewers.

e. Make service connection to sewer system at manhole when directed by PROJECT MANAGER. Where service connection pipe is connected to manhole or concrete structure make connections so standard pipe joint is located not more than 1.5 feet from structure.

3.7 BACKFILLING AND COMPACTION

A. Backfill and compact all pipe trenches as specified in Section 02320, TRENCH BACKFILL.

B. Repair excavations in roadways as specified in Section 02575, SURFACE RESTORATION.

3.8 WORK STOPPAGE

A. If the work is stopped on the whole or any part of the trench, and the same is left open for an unreasonable length of time in advance of the construction for any reason except delay in removing obstructions over which the CONTRACTOR has no control, the CONTRACTOR shall, when directed, refill such trench or part thereof and temporarily re pave over the same with 8-inch rock base and asphalt cold patch at his own cost and expense, and he shall not again open such trench of part thereof until he is ready to proceed with construction.

3.9 SEWER CLEANING ANDCCTV INSPECTION

A. Prior to final acceptance and final manhole-to-manhole inspection of the sewer system by project manager, flush and clean all parts of the system. Remove all accumulated construction debris, rocks, gravel, sand, silt and other foreign material from the sewer system at or near the closest downstream manhole. If necessary, use mechanical rodding or bucketing equipment.

B. The following general procedure shall be followed to pressure clean and televise the sewer pipes. The work shall be accomplished completely in one (1) manhole section at a time. A manhole section is defined as the length of the pipe connecting two manholes. Internally inspect pipelines by CCTV after the completion of pipeline cleaning and testing. Conduct inspection in presence of PROJECT MANAGER.

1. High-pressure clean a manhole section.

2. Inspect the manhole section internally with TV within three (3) days of cleaning and make a log of conditions encountered.

3. Simultaneous with TV inspection make a video tape recording of each manhole section.

4. Take Polaroid or digital photos of the monitor image as required by the PROJECT MANAGER.

5. Plug off manhole at ends of line so no flow enters new sewer pipe except that from service connections.

6. Pull camera at uniform rate, stopping to properly document defects. Maximum pull speed of camera shall not exceed 30 feet per minute.

C. Provide detailed information on the video tape at each starting manhole and similar information on the sewer logs. At a minimum, provide company name, project name, date of video, street name, manhole number, manhole-to-manhole run, manhole diameter, direction of flow, size of pipe, type of pipe, crew leader name, OWNER's inspectors name, lateral location (footage from manhole), and direction (north, south, east or west).

D. Show sufficient detail to determine cracks in pipe, offset joints, leaking joints, sags and other flaws in pipeline installation. Record location of deficiencies by distance from center of reference manhole.

E. Upon completion, playback tape in presence of PROJECT MANAGER. Any tape not meeting quality standards will be rejected and taping process repeated.

F. Correct deficiencies in pipe found because of video replay. Replace any sewer pipe which has any deficiencies specified. Grouting of leaky joints or a damaged pipe on new sewer pipe will not be accepted. Reinspect the replaced pipe for deficiencies and replace pipe until no deficiencies exist.

G. Dispose of cleaning water in a manner that will not damage or interfere with adjacent property and in a manner acceptable with PROJECT MANAGER and regulatory agencies.

3.10 HYDROSTATIC TEST

A. General:

1. Notify PROJECT MANAGER in writing five (5) days in advance of testing. Perform testing in presence of PROJECT MANAGER.

2. Test sections of construction sewer between stations only after service connections, manholes, and backfilling had been completed. Testing may be done prior to placement of asphaltic concrete or roadway structural section.

3. Isolate new pipelines that are connected to existing pipelines. Install pipe plugs as required to allow section of new pipe to be pressure tested.

4. Plug wyes, tees and stubs, in service connections with gasketed caps or plugs securely fastened or blocked to withstand internal test pressure. Such plugs or caps shall be removable, and their removal shall provide socket suitable for making flexible join in lateral connection or extension.

5. Furnish testing equipment and perform tests as approved by project manager. Testing equipment shall provide observable and accurate measurement of leaking under specified conditions.

6. Provide and bear costs of necessary water required for testing project piping.

B. Testing Equipment Accuracy: Plus, or minus ½- gallon of water leakage under specified conditions.

C. Maximum Allowable Leakage: 0.16 gallons per hour per inch diameter per 100 feet. Include service connection footage and test section, subjected to minimum head specified.

D. Exfiltration Test:

1. Hydrostatic Head:

a. At least six (6) feet above maximum estimated groundwater level in section being tested.

b. No less than six (6) feet above inside top of highest section of pipe in test section, including service connections.

2. Length of Pipe Tested: Limit length such that pressure on invert of lower end of section does not exceed thirty (30) feet of water column.

E. Infiltration Test:

1. Groundwater Level: At least six feet above inside top of highest section of pipe in test section, including service connections.

F. Piping with groundwater infiltration rate greater than allowable leakage rate for exfiltration will be considered *defective* even if pipe previously passed a pressure test.

G. Defective Piping Sections: Replace, and retest as specified.

3.11 LOW PRESSURE AIR TESTING

A. In accordance with ASTM F-1417

B. General:

1. Notify PROJECT MANAGER in writing five (5) days in advance of testing. Perform testing in presence of PROJECT MANAGER.

2. Test sections of constructed sewer between stations only after service connections, manholes, and backfilling have been completed. Testing may be done prior to placement of asphaltic concrete or roadway structural section.

3. Isolate new pipelines that are connected to existing pipelines. Install pipe plugs as required to allow section of new pipe to be pressure tested.

4. Plug wyes, tees, stubs, and service connections with pneumatic plugs. The plug design shall be such that they will hold against the test pressure without external blocking for bracing. Such plugs shall be removable, and their removal shall provide socket suitable for making flexible jointed lateral connection or extension. One of the plugs shall have three (3) air hose connections; one (1) for inflating the plug, one (1) for reading the air pressure and one (1) for introducing air into the sealed line.

4. Furnish testing equipment and performed tests as approved by PROJECT MANAGER. Testing equipment shall provide observable and accurate measurement of leakage under specified conditions. Calibrate gauges with standardized test gauge had started each testing day. Install compressor, air piping manifolds, gauges, and valves at ground surface.

6. Provide pressure release device, such as ruptured disc or pressure relief valve, to relieve pressure at eight (8) psig or less. Low pressure air testing cannot be used if water table elevation is more than two feet over the top of the pipe.

C. No person shall enter manhole or structure or occupy area above opening of manhole or

structure where pipe is under pressure.

D. Lower pressure air shall be slowly introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure resulting from any groundwater above the pipe. At least two (2) minutes shall elapse to allow the pressure to stabilize.

E. The time required for the internal pressure to decrease from 3.5 to 2.5 psig greater than the average backpressure should not be less than the time shown for a given pipe diameter:

Pipe Diameter (in.)	**Minimum Elapsed Time (min.)**
8	7.5
10	9.25
12	11.25
15	14
18	17

F. Defective Piping Sections: Replace and retest as specified.

3.12 SUPPLEMENTS

A. The supplements listed below, following "END OF SECTION", are part of this Specification.

1. Data Sheets.

Number	**Title**
02632-03	Polyvinyl Chloride (PVC)

END OF SECTION

SECTION 02632.03
POLYVINYL CHLORIDE (PVC)

Item	Description
Pipe: 15-inch diameter and under	ASTM D3034: standard dimension ratio less than 26, except that the cell classification shall be 12454- B 412454- C as defined in ASTM D1784.
Pipe: 18- through 24- inch diameter	ASTM F679: standard dimension ratio less than 18, except that the cell classification shall be 12454- C defined in ASTM D1784.
Ribbed Profile Pipe: 18-through 36-inch diameter	ASTM F794: minimum stiffness of 46 PS I win tested in accordance with ASTM D2412, except that the cell classification shall be 12454- C as defined in ASTM 1784.
Joints	ASTM D3212 rubber gasketed.
Gaskets	ASTM F477. Lubricants: as approved by manufacturer.
Fittings	PVC, gasketed. Provide plug when service piping is not required.
Plugs	Removable. Removal shall provide a socket suitable for making a flexible jointed lateral connection or extension.
Source Quality Control Testing	In accordance with applicable ASTM standard(s)

END OF SECTION

SECTION 02654
MANHOLE REHABILITATION CHIMNEY SEAL

PART 1 GENERAL

1.01 SCOPE

This specification includes the materials and procedures required for the internal sealing of the frame-chimney joint area of brick and block manholes and the entire chimney area of precast, fiberglass and plastic manholes.

1.02 WORK REQUIRED

A. An internal manhole frame seal, as specified herein shall be installed in all manholes within the areas included in this project. If excavation is required to repair, rebuild, or replace a manhole; or if manhole linings or coatings are required, the seal shall be installed after that work has been completed.

B. Brick or Block Manholes - When frame sealing is required on brick or block manholes, an internal flexible rubber frame seal, meeting the requirements of this specification, shall be used to seal the frame-chimney joint area of the manhole.

C. Precast, Fiberglass or Plastic Manholes - When frame sealing is required on precast, fiberglass or plastic manholes, an internal flexible rubber frame seal meeting the requirements of this section, shall be used to seal the entire chimney of the manhole. The seal shall extend from the frame down to the top of the cone.

1.03 DEFINITIONS

A. Chimney - The cylindrical variable height portion of the manhole structure used to support and adjust the finished grade of the manhole frame. The chimney extends from the top of the corbel or cone to the base of the manhole frame.

B. Cone or Corbel - That portion of the manhole structure which slopes upward and inward from the barrel of the manhole to the required chimney or frame diameter. Corbel refers to a section built of brick or block, while cone refers to a precast, fiberglass or plastic section.

1.04 SYSTEM DESCRIPTION

A. Design Requirements - The manhole frame seal shall be designed to prevent leakage of water through the above-described portions of the manhole throughout a 50-year design life. The seal shall also be designed so that it can be installed in manholes where the diameters of the frame and chimney differ by up to 20%.

B. Performance Requirements - The frame seal shall be capable of repeated vertical movement of the frame of not less than 2 inches and/or repeated horizontal movement of not less than 1/2 inch after installation and throughout its design life.

1.05 QUALITY ASSURANCE

A. Acceptance Testing - Manhole frame seals shall be visually inspected after installation to ensure that the seal is properly positioned, tight against the manhole and frame surfaces, that no voids or leakage points exist and that the bands are securely locked in place. Any seals

failing this test shall be reworked as necessary and retested at no additional cost to the OWNER. Any seals

B. FULL SPECIFICATIONS: LSS internal Chimney Seal not passing this visual inspection may, at the CONTRACTOR's option, be tested for leakage using a method approved by the CITY's PROJECT MANAGER.

PART 2 PRODUCTS

2.01 FRAME SEAL

Frame seals shall consist of a flexible internal rubber sleeve and stainless-steel expansion bands, all conforming to the following requirements:

A. Rubber Sleeve - The flexible rubber sleeve shall be extruded or molded from a high-grade rubber conforming to the applicable material requirements of ASTM C-923, with a minimum 1500 psi tensile strength, a maximum 18% compression set and a hardness (durometer) of 48±5. The sleeve shall be corrugated and available in four widths with unexpanded vertical heights of 8 inches (LSS 0-6), 10 inches (LSS 6-12), 14 inches (LSS 12-18) and 18 inches (LSS 18-24). The sleeve shall have a minimum thickness of .130 inches and a range of coverage which allows a span of up to 24 vertical inches of chimney without the use of an extension. The area of the seal that compresses against the manhole frame casting and the chimney/cone shall have a series of sealing fins to facilitate a watertight seal.
Any splice used to fabricate the sleeve shall be hot vulcanized and have a strength such that the sleeve shall withstand a 180-degree bend with no visible separation.

B. Expansion Bands - The expansion bands used to compress the sleeve against the manhole shall be integrally formed from 16-gauge stainless steel conforming to the applicable material requirements of ASTM C-923, Type 304, with no welded attachments and shall have a minimum width of 1-3/4 inches.
The bands shall have a minimum adjustment range of 2-1/2 diameter inches and the mechanism used to expand the band shall have the capacity to develop the pressures necessary to make a watertight seal. The band shall be permanently held in place with a positive locking mechanism which secures the band in its expanded position after tightening.

C. Acceptable Manufacturers
1. Cretex Specialty Products or approved equal.

2.02 EQUIPMENT
The contractor shall have a manufacturer's recommended expansion tool and all other equipment/tools necessary to prepare the surfaces of the manhole and install the frame seals.

2.03 REPAIR MORTAR
Repair mortar shall be a one component, quick set, high strength, non-shrink; polymer modified cementitious patching mortar, which has been formulated for vertical or overhead use meeting the requirements of ASTM C-109 for Compressive Strength, C-348 and C-78 for Flexural Strength and C-882 for Slant Shear Bond Strength. Repair mortar shall not contain any chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents nor shall it promote the corrosion of any steel that it may encounter.

2.04 CEMENTITIOUS GROUT
Cementitious grout shall be a premixed, nonmetallic, high strength, non-shrink grout which meets the requirements of ASTM C-191 and C-827 as well as CRD-C-588 and C-621. When mixed to a mortar or "plastic" consistency, it shall have minimum one day and 28-day compressive strength of 6,000 and 9,000 psi, respectively.

PART 3 EXECUTION

3.01 FIELD MEASUREMENTS

The CONTRACTOR shall field measure the manholes to determine the information required on the manufacturer's "Sizing and Ordering" procedure. This information is needed to obtain the proper size of bands and size and width of the rubber sleeve.

3.02 SURFACE PREPARATION

All loose and protruding mortar and brick that would interfere with the seal's performance shall be removed and the appropriate areas of the manhole frame, chimney and or cone/corbel cleaned by wire brushing. All sealing surfaces shall be reasonably smooth and circular, clean and free of any loose material or excessive voids. If an adequate sealing surface does not exist on the masonry, a repair mortar conforming to the requirements of Section 2.03 shall be used to prepare a uniformly vertical 3"-4" wide surface for the sleeve and extensions to seal against.

Detailed surface preparation, including providing a vertical surface on a cone when none exists, shall be in accordance with the frame seal manufacturer's instructions.

3.03 REALIGN MANHOLE FRAM

All manhole frames that are misaligned from the chimney or cone/corbel by 3 inches or more shall be excavated and realigned. All existing frames shall be thoroughly cleaned before reinstallation. The frames shall be set in a bed of cementitious grout conforming to the requirements of Section 2.04, mixed to a mortar or plastic consistency. The frames shall be set so that the tops of the covers are flush with the adjoining pavement or ground surface.

3.04 INSTALLATION OF FRAME SEAL

The internal frame seal shall be installed in accordance with the manufacturer’s instructions.

PART 4 MEASUREMENT AND PAYMENT

4.01 MANHOLE FRAME SEAL

This item shall be paid at the unit price bid per manhole frame seal and shall include the cost of furnishing and installing an internal rubber seal along with the surface preparation work needed to facilitate its installation. Measurement shall be based on the actual number of seals installed.

4.02 REALIGN MANHOLE FRAME

A. Paved Areas - This item shall be paid at the unit price bid for frame realignment- paved, and shall include the cost of all saws cutting, pavement removal, disposal and replacement, excavation, backfill and the cleaning and reinstallation of the existing frame.

B. Unpaved Areas - This item shall be paid at the unit price bid for frame realignment-unpaved, and shall include the cost of excavation, cleaning, and reinstallation of the frame, backfill and surface restoration.

Measurement of each item shall be based on the actual number of each type of frame realignment.

END OF SECTION

SECTION 02655
NON-STRUCTURAL MANHOLE LINING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Work required for the various types of manhole coatings/linings identified in the repair schedule contained in the plans. The materials and methods included in this section are designed to eliminate infiltration through manhole walls and prevent further deterioration/ corrosion of the interior of manholes. Materials of lining include spray applied elastomeric resins and concrete embedded polyvinyl chloride in a high-density polyethylene liner.

B. Related Work Specified Elsewhere Includes:

1. Section 01025-Measurement and Payment
2. Section 01300- Submittals
3. Section 02676- Leakage Tests
4. Section 02999- Miscellaneous work and clean up

1.2 SUBMITTALS

A. CONTRACTOR shall submit manufacturers technical literature on material and description of installation method including, but not limited to:

1. Requirements for application, such as temperature and humidity.
2. Requirements for worker safety, such as ventilation and safe handling procedures.
3. Maximum storage life.
4. Mixing and proportioning requirements for specific application.
5. Pot life.
6. Curing time.
7. Physical properties.
8. Test results on resistance to abrasive chemicals

1.3 QUALITY ASSURANCE

1. Product application shall be performed only by workmen trained and experienced with specified material and trained in confined space entry.

2. Certification: Applicators for spray-applied coating installation shall be certified by the manufacturer.
3. Spray equipment shall be specifically designed to accurately ratio and apply the coating products and shall be in good working order.

4. CONTRACTOR Experience: Minimum of five (5) years of experience with similar applications of the materials specified.

PART 2 PRODUCTS

2.1 SPRAY APPLIED RESINS

A. The spray-applied coating shall be resistant to hydrogen sulfide gas, sulfuric acid, and other chemicals typically found in sanitary sewers.

B. The spray- applied coding shall also be resistant to damage due to impact and abrasion.

C. The spray- applied coating shall be an elastomeric polymer compound, e.g., Integrated Environmental Technologies (IET), Raven or pre-approved equal. The liner shall conform to the minimum physical requirements listed below.

Hardness (Shore D), ASTM D2240	65 +/- 5
Tear Strength (Die C), ASTM D624	190 psi
Tensile Strength (ASTM D412)	2000 psi
Chemical Resistance (ASTM D453)- Exposure to Sodium hypochlorite (10 percent) and sulfuric acid (15 percent) for 168 hours	No degradation in physical or mechanical properties

PART 3 EXECUTION

3.1 GENERAL

A. All pipes in service shall be clogged or bypassed in accordance with Section 02750 before any work is started on the structure. No debris shall be flushed down the line.

B. Only personnel who are aptly trained in confined space entry shall be permitted to enter the structure. All OSHA requirements for confined space entry equipment and permitting shall be complied with. The CONTRACTOR shall obtain a confined space entry permit from City of Fort Lauderdale Utilities prior to beginning any work.

3.2 SPRAY APPLIED RESINS

A. Pre-Installation/ Surface Preparation

1. High Pressure Grout: High pressure grout shall be injected from the interior of the manhole surfaces into cracks and voids to stop leaks. The use of hydraulic cement will not be allowed.

a. Suitable equipment shall be utilized for pumping the grout from above ground through a hose and injecting the grout under pressure to fill voids beyond the manhole structure. **The equipment shall have a means of measuring the amount of grout used in gallons.**

b. Grout shall be used in accordance with the manufacturer's recommendations for the specific application.

c. The following are acceptable grout products: Avanti AV-202 Multigrout or pre-approved equal.

2. Patching Cement: After all loose and deteriorated material has been removed from the

interior surfaces of the manhole and after all leaks have been grouted, patching cement shall be applied to fill any irregularities to achieve an acceptable smooth surface.

a. Patching cement shall be compatible with the liner material as specified in 2.2 here in.

3. Evaluation of Atmosphere: Prior to entering structures, an evaluation of the atmosphere shall be conducted to determine the presence of toxic, flammable vapors or possible lack of oxygen. The evaluation shall be in accordance with local, state, or federal safety regulations.

4. Clean manhole ring and cover free of rust and debris so the lid will properly seat when reinstalling the lid. Use power brushing such as wire wheel on a grinder/ needle gun as most types of debris cannot be removed by hand wire brushing.

5. Surface is to be lined shall be cleaned and abraded to provide a sound surface with adequate profile and porosity to provide strong bond between lining and substrate.

6. High Pressure Water Jetting (NACE Standard No. 5/SSPC-SP12) abrasive (sand) blasting, and mechanical wire- brushing shall be the methods to remove previous coatings, laitance, contaminated, disintegrated, or chalky material. Detergent water cleaning and hot water blasting may be necessary to remove oil and grease.

7. Use of acid for cleaning purposes, no matter how dilute, will not be allowed. Loose or protruding brick, mortar and concrete shall be removed by using a mason's hammer and chisel. Fill any large voids with quick setting cement patch mix recommended by the manufacturer of liner product. The surface to be repaired must be clean and free of any loose materials.

8. Application of liner shall not be made unless ambient temperature inside the structure is 50 degrees Fahrenheit or higher.

9. After the patched areas have cured sufficiently, repair manhole wall surfaces in accordance with the manhole liner manufacturer's recommendations.

10. All resurfaced or repaired services shall be inspected for cleanliness and suitability to receive spray-applied liner. Additional surface preparation may be necessary prior to application.

B. Apply manhole liner in accordance with manufacturer's recommendations regarding temperature and installation procedures and in accordance with City of Fort Lauderdale Utilities Specifications. The liner shall be applied to invert and the walls of the manhole on the bench up to the bottom of the casting.

C. Prepared surfaces shall be lined by spray application to a minimum wet film thickness of 125 mils.

D. During application, a wet film thickness gauge meeting ASTM D4414 shall be used. All necessary measurements shall be taken and attested to by the CONTRACTOR. Written reports signed by the CONTRACTOR shall be given to the CITY and ENGINEER.

E. Allow the final application to cure for time recommended by the manufacturer before being subjected to sewage flow or installation of spray-applied liner (where indicated).

3.4 QUALITY CONTROL

A. SPRAY APPLIED RESINS

1. Inspect lining system for holidays, cracks and pin holes using the spark-test method and equipment in accordance with NACE RPO 188. Especially check the lining over brick, block, and very rough surfaces.

2. Repair voids and holidays per the manufacturer's instructions. All wells shall be physically tested by a non-destructive probing method. All patches over holes, or repairs to the liner whoever damage has occurred, shall be accomplished in accordance with item 3.3 (F).

3.5 SAFETY

A. CONTRACTOR shall carry out operations under this section in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving any entry into a confined space. It shall be CONTRACTOR's responsibility to comply with OSHA standards and regulations pertaining to all aspects of the work.

PART 4 WARRANTY

4.1 General

A. Provide a five (5) year unlimited warranty on all workmanship and products. That work covered by the warranty shall include surface preparation, grouting, liner application, as well as other work performed under this section. The warranty shall be affective beginning on the date of the final acceptance by City of Fort Lauderdale utilities and shall guarantee that the manhole will be protected from leaks and from failure due to corrosion from exposure to hydrogen sulfide and other corrosive chemicals normally encountered in raw sewage.

END OF SECTION

SECTION 02656
MANHOLE REPAIRS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Work required for the various types of manhole repairs to prevent inflow (rainwater entering manholes through frame/lid and chimney). Materials and methods include sealing manhole chimneys with cured-in-place or prefabricated products and manhole frame/cover sealing/replacement. Chimney seals shall be provided for (i) all manholes where the existing frame is to be removed and either reset or replaced with a new frame (ii) Manhole chimneys where inflow is detected.

B. Related Work Specified Elsewhere Includes:

1. Section 01025- Measurement and Payment
2. Section 01300- Submittals
3. Section 02999- Miscellaneous Work and Clean Up
4. Section 02216- Excavation
5. Section 02315- Fill and Backfill
6. Section 02575- Surface Restoration
7. Section 02958- Structural Manhole Lining
8. Section 02655- Non-Structural Manhole Lining

1.2 SUBMITTALS

A. CONTRACTOR shall submit manufacturers technical literature on material and description of installation method including, but not limited to:

1. Requirements for application, such as temperature and humidity.
2. Requirements for worker safety, such as ventilation and safe handling procedures.
3. Maximum storage life.
4. Mixing and proportioning requirements for specific application. (cured- in- place products)
5. Pot life. (cured-in-place products)
6. Application thickness per coat. (cured- in-place products)
7. Curing time. (cured- in-place products)

1.3 QUALITY ASSURANCE

A. Product application shall be performed only by workmen trained and experimented with specified material and trained in confined space entry.

B. Certification: Applicators for Cured-in-Place Chimney Liner installation shall be certified by the manufacturer.

C. Contractor Experience: Minimum of five (5) years of experience with similar applications of the

material specified.

PART 2 PRODUCTS

2.1 FRAME & COVER

A. Casting for manhole frames and covers shall conform to ASTM A48 class 30 and shall be traffic bearing.

B. The seating surfaces between frames and covers shall be machined to fit true so the frames and covers do not shift under traffic conditions or permit entry of stormwater from flooding.

C. Lifting or pick holes shall be provided but shall not penetrate the cover.

D. The words "SANITARY SEWER" and "CITY OF FORT LAUDERDALE" shall be cast in all manholes covers.

E. Manhole frames and covers shall be EJ USA, Inc. Product number NPR13-2378B or pre-approved equal.

F. Two (2) rows of butyl rubber rope mastic shall be applied to the top surface of the manhole chimney or cone (whichever the frame will attach to). The frame shall be carefully set onto the rope mastic so that the frame opening is concentric to manhole opening.

G. Inflow protectors shall be provided for all manholes. ABS or 316 Stainless steel inflow protectors shall be provided for manholes and non-traffic bearing locations. High-Quality 316 stainless steel inflow protectors with a consistent thickness of not less than 18 Gage shall be provided for manholes in traffic bearing locations.

H. Inflow protectors shall have a deep-dish bold design with no less than eight (8) inches in depth to allow easy and unobstructed removal of the manhole cover.

I. Manhole inflow protectors are to be manufactured with a one-piece gasket installed at the factory for a tight, consistent fit. The rubber gasket is to be designated to securely wrap around the entire leading edge of the inflow protector at the point where it meets the manhole frame and cover.

J. The wrap-around rubber gasket is to be manufactured to a width of no less than 3/8 inches, consistent on top and bottom of the leading edge of the inflow protector. The gaskets shall be no more than 3/32 inches thick.

K. The insert removal handle shall be manufactured of high-quality stainless steel for strength and durability. They handle shall be installed in such a way that it does not interfere with the installation or removal of the manhole cover. The handle shall be designed and manufactured to withstand a minimum pull force of 500 pounds before it fails or separates from the insert.

L. The inscription "PROPERTY OF FORT LAUDERDALE UTILITIES" shall be etched at the base of the handle frame to provide long- lasting identification marker for the OWNER.

M. Inflow protectors shall be as manufactured by Sewer Shield, Inc., Maitland, FL or pre- approved equal.

2.4 BENCH AND INVERT

A. Repair of bench and invert shall be accomplished utilizing either the Raven or IET product in accordance with Sections 02958-01 or 02958-02 or cementitious lining material as follows:

1. Specially formulated prepackaged mixes shall be used. The material shall be fiber reinforced and contains special additives which produce a minimum 24-hour compressive strength of 3000 PSI, in a minimum 28-day compressive strength of 8,000 PSI. The material shall form a mechanical and chemical bond to the manhole surface and have zero shrinkage.

2. The mortar shall include a calcium aluminate or other ENGINEER-approved substance to be suited for resistance against corrosion.

B. Bench Application:

1. The bench shall be sprayed such that a gradual slope is produced from the walls to the invert with the thickness at the edge of the invert being no less than ½ inch. The material shall be applied to the bench area in such a manner as to provide for proper drainage without ponding. The material shall be smooth steel tile finish slipping from wall to invert. The bench intersection shall be rounded to a uniform radius the full circumference of the intersection.

C. Invert Repair

1. Invert repair shall be performed on all inverts with visible damage or infiltration as identified by the OWNER. After blocking the flow through the manhole and thoroughly cleaning the invert, a quick- setting patch mix shall be applied to the invert in an expeditious manner. The mix shall be troweled uniformly into the invert, extending out onto the bench sufficiently to tie into the liner spray applied to the bench or to the existing manhole bench. The finished invert shall be u- shaped uniform with pipe diameter with a minimum depth or 6" for 8" pipe and full depth for greater sized mains. Finish is to be then accomplished by steel trowel. Pipe crowns are to be built on all pipes. Invert shall be at least 2 inches thick and be smooth and free of ridges.

D. Curing:

1. A material shall be cured according to the manufacturer's instructions and recommendations.

2. Caution should be taken to minimize exposure of applied product to sunlight and air movement. A no time should the finished product be exposed to sunlight or air movement for longer than 15 minutes curing the curing process before replacing the manhole cover.

3.0 WARRANTY

A. Provide five (5) year unlimited warranty on all workmanship and products. The work covered by the warranty shall include surface preparation, grouting, liner application, as well as other work performed under this section. The warranty shall be effective beginning on the date of final acceptance by City of Fort Lauderdale Utilities and shall guarantee that the manhole will be protected from leaks and from failure due to corrosion from exposure to hydrogen sulfide and other corrosive chemicals normally encountered in raw sewage.

END OF SECTION

SECTION 02676
LEAKAGE TESTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Testing for any signs of leakage in all rehabilitated gravity sewers by hydrostatic testing using infiltration/exfiltration methods.

B. Operation of Existing Facilities: Conduct all tests in a manner to minimize as much as possible any interference with the day-2-day operations of existing facilities.

1.2 PERFORMANCE REQUIREMENTS

A. Written notification of testing: Provide written notice when the work is ready for testing and make the tests as soon thereafter as possible.

1. Personnel for reading meters, gauges, or other measuring devices, will be furnished.

2. Furnish all other labor, equipment, air, water, and materials, including meters, gauges, smoke producers, blower, pumps, compressors, fuel, water, bulkheads and accessory equipment.

1.3 SUBMITTALS

A. Provide all submittals, including the following, as specified in Division 1.

B. Testing Report: Prior placing the sewer system in service submit for review and approval a detailed bound report summarizing the leakage test data, describing the test procedure, and showing the calculations on which, the leakage test data is based.

1. The length and diameter of the section of the line tested (MH to MH) including any laterals.

2. A complete description of test procedures and methods, including type of plugs used and where, depth of sewer, groundwater pressure over sewer pipe, and amount of leakage measured.

3. The name of the inspector/tester and the date(s) and the time(s) of all testing, including any retesting.

4. A description of any repairs made.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 INFILTRATION/ EXFILTRATION TEST FOR GRAVITY SEWER

A. The allowable limits of infiltration or exfiltration for the entire system, or any portion thereof, shall not exceed a rate of 50 gallons per inch inside pipe diameter per mile of pipe for 24 hours.

B. No additional allowance shall be made for house service lines. Any part of or at all the system shall be tested for infiltration or exfiltration, as directed by the ENGINEER, or as required by the CITY.

C. The procedures and limitations for conducting infiltration/exfiltration tests shall be established at the pre-construction conference on a project-by-project basis.

D. All testing shall be run continuously for 24 hours, unless the OWNER'S REPRESENTATIVE can visually verify that this test duration is not required due to the observed infiltration/exfiltration rate.

E. The amounts of infiltration or exfiltration shall be determined by pumping water into or out of calibrated drums, or by other methods approved by the ENGINEER and the CITY, such as in-line V-notch weirs.

F. Infiltration: Prior to testing for infiltration, the system shall be pumped out so that normal infiltration conditions exist at the time of testing. The cumulative results of the entire collection system results shall not be satisfactory method for gauging infiltration compliance. Each sewer section between manholes must permit infiltration no greater than the maximum allowable, as specified above.

G. Exfiltration: The exfiltration test, when required due to groundwater levels, will be conducted by filling the portion of the system being tested with water to a level two (2) feet above the uppermost manhole invert or one (1) foot above the pipe crown, whichever is greater, in the section being tested. The cumulative results of the entire collection system results shall not be a satisfactory method for gauging exfiltration compliance. Each sewer section between manholes must permit exfiltration no greater than the maximum allowable, as specified above.

H. Where infiltration or expectation exceeds the allowable limit specified herein, the CONTRACTOR shall at his own expense, determine the source of leakage. He shall then repair or replace all defective materials and/or workmanship at no additional cost to the CITY until a satisfactory test is achieved.

I. If the defective portions cannot be located, remove, and reconstruct as much of the work as is necessary in order to conform to the specified allowable leakage limits.

J. all visible leaks shall be repaired regardless of the amount of leakage.

K. Provide all labor, equipment and materials required and conduct all testing required under the direction of the OWNERS REPRESENTATIVE.

END OF SECTION

SECTION 02750
WASTEWATER FLOW CONTROL

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The work specified in this Section includes all labor, materials, accessories, equipment, and tools for performing all operations required to bypass pump sewage around a manhole or sewer section, or a sewer service lateral in which work is to be performed. The CONTRACTOR shall be prepared to bypass pump sewage as part of his operations.

B. The CONTRACTOR shall provide all pumps, piping, and other equipment to accomplish this task; Perform all construction; obtain all permits; pay all costs; and perform complete restoration of all existing facilities to equal or better condition to the satisfaction of the OWNER.

C. Wastewater Flow Control shall conform to Section 01010, Part 3

1.2 GENERAL

A. When sewer line flows at the upstream manhole of the main sewer line being repaired are above the maximum allowable requirements for television survey, or do not allow the proper sewer or manhole repair, the flow shall be reduced to the levels indicated by one of the following methods: manual operation of pumping stations by OWNER forces, by the CONTRACTOR plugging/blocking of the flows, or by the CONTRACTOR pumping/bypassing of the flows as acceptable to the OWNER.

B. For the initial television survey, before and after any repair except for joint testing and sealing, the sewer line should be blocked completely. No flow, except infiltration/ inflow, will be allowed through the respective sewer line being televised on the pre-repair television survey, and the post-repair television survey.

C. For all other television surveys, including warranty surveys and joint testing and ceiling operations, the depth of flow within the sewer shall not block the camera inspection.

D. All system flows from the upstream basin shall be stopped by plugging the main line at the upstream manhole, and by plugging every service line at the clean out, prior to inserting and curing any CIPP product.

E. When the sewer line flows at the upstream manhole of the line being repaired, in the opinion of the OWNER, are too excessive to plug while the rehabilitation is being performed, the CONTRACTOR shall submit a written plan for plugging/pump/bypassing the flow to a designated downstream manhole as acceptable to the OWNER.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit complete, detailed plans for this aspect of work to the OWNER for review.

1.4 PUMPING AND BYPASSING

A. When pumping/bypassing is required, as determined by the OWNER, the CONTRACTOR will supply the necessary pumps, conduits, and other equipment to divert the flow of sewage around the manhole, mainline section, or service line in which work is to be performed. The bypass system shall be of sufficient capacity to handle

existing flows plus additional flow that may occur during periods of rainstorms. "Lay-flat" hoses shall be used whenever possible. "Hard Pipe" hoses may be permitted upon agreement with the OWNER that site conditions require the use of such. The CONTRACTOR will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. A "setup" consists of necessary pumps, conduits, and other equipment to divert the flow of sewage around a manhole, a mainline section, or service lateral from the start to finish of work performed.

B. Pumps and equipment shall be continuously monitored by the CONTRACTOR.

1. Pumps: Any sump pumps, bypass pumps, trash pumps or any other type of pump which pulls sewage/water or any type of material out of the sewer system shall discharge this material into an approved designated manhole~~,~~ or appropriate vehicle or container acceptable to the OWNER. Under no circumstances shall this material be discharged, stored, or deposited on the ground, swale, road, or open environment.

2. Traffic Control: The CONTRACTOR shall take appropriate steps to ensure that all pumps, piping and hoses that carry raw sewage are protected from traffic. Traffic control shall be performed by the CONTRACTOR.

3. Maintaining service: When a service line requires flows to be maintained, the CONTRACTOR shall install two (2) clean outs eighteen (18) inches apart and shall plugged the flow between the cleanouts and pump the flow from an upstream clean out to an approved designated downstream manhole, appropriate vehicle, or another approved access point in the sewer system.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02751
PREPARATORY CLEANING, ROOT, AND TUBERCULATION REMOVAL

PART 1 GENERAL

1.1 SCOPE

A. This section covers the preparatory cleaning of sewer lines and manholes as needed prior to the internal survey of the sewer lines by closed-circuit television. It also covers the preparatory cleaning, root and tuberculation removal of sewer lines and cleaning of manholes prior to rehabilitation. The CONTRACTOR shall furnish all necessary material, labor, equipment, and services required for cleaning the specific sewer lines, laterals, and manholes.

B. Sewer Line Cleaning: The intent of sewer line cleaning is to remove foreign materials from the lines and restore the sewer to the original carrying capacity or as required for proper installation of mainline and lateral CIPP or performance of other specified work. All tuberculation, roots, and grease, on the interior of the pipeline, shall be removed disposed of by the CONTRACTOR.

C. Designated sewer sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The equipment shall dislodge, transport, and remove all sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, tubercules, and other debris from the interior of the sewer pipes and manholes. The equipment and methods selected shall be based on the conditions of lines and manholes at the time the work commences and shall be satisfactory to the OWNER. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If again unsuccessful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, the cleaning effort shall be stopped, and sufficient inspection performed so that the OWNER can be notified of the reason for inability to continue.

D. During all cleaning and preparation operations all necessary precautions shall be taken to protect the sewer from damage. During these operations, precautions shall also be taken to ensure that no damage is caused to public or private property adjacent to or served by the sewer or its branches.

E. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible, the flow of sewage in the sewer shall be utilized to provide the necessary pressure for hydraulic cleaning devices. The CONTRACTOR shall employ operational hydrant meters to be obtained from the OWNER and shall obtain water only from the OWNER's hydrants. No fire hydrant shall be obstructed in case of a fire in the area served by the hydrant.

F. Preparatory cleaning, root and tuberculation removal shall conform to Section 01010, Part 3.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 MATERIAL REMOVAL

A. All sludge, dirt, sand, rocks, grease, roots, tubercules and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could

cause line stoppages, accumulations of sand in wet wells, or damaged to pumping equipment, shall not be permitted.

B. Under no circumstances shall sludge, tubercules or other debris removed during these operations be dumped or spilled into the streets, ditches, storm drains or other sanitary sewers. The CONTRACTOR shall remove from the site and properly dispose of all solids or semi-solids recovered during the cleaning operation. The CONTRACTOR shall obtain permits and decide as required to properly dispose of solids.

C. The CONTRACTOR is advised that he shall not dispose of this material by legal or illegal dumping on private or public property, by sale to others, or any means other than those given above.

D. The general requirements for vehicles hauling such waste materials are as follows: transport vehicles must be of type(s) approved for this application by the political jurisdictions involved. General requirements are that the vehicles have watertight bodies, that they be properly equipped and fitted with seals and covers to prohibit material spillage or drainage, and that they are cleaned as often as is necessary to prevent deposit of material on roadways. Vehicles must be loaded within legal weight limits and operated safely within all traffic and speed regulations.

E. Routes used by the CONTRACTOR for the conveyance of this material on a regular basis shall be subject to approval by the governing authority having jurisdiction over such routes.

F. All solids or semi solids resulting from the cleaning operations shall be removed from the site and disposed of by the CONTRACTOR in a legal and sanitary manner as approved by the appropriate authorities and at the CONTRACTOR's cost. Copies of records of all disposals shall be furnished to the OWNER, indicating disposal site, date, amount, and brief description of material disposed. All materials shall be removed from the site no less often than at the end of each workday.

3.2 ROOT AND TUBERCLES REMOVAL

A. Roots shall be removed in the designated sections and manholes where root intrusion is indicated on the work order. Special attention should be exercised during the cleaning operation to assure almost complete removal of roots from the joints. Any roots which could prevent the proper survey or rehabilitation shall be removed. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners.

B. CONTRACTOR shall carefully evaluate the extent of tuberculation encountered in a pipe prior to proceeding with removal of tubercules. Use of remote power-driven cutting or chain devices during removal of tubercules must be performed avoiding collapse of the host pipe. CONTRACTOR must vet the equipment and proposed extent of tubercules removal and obtain authorization from the PROJECT MANAGER before proceeding with the work. To minimize the risk of sewer collapse during tuberculation removal it will be preferable to leave some of the existing tuberculation in place and proceed with subsequent lining of the host pipe by using a small diameter cured-in-place liner. CONTRACTOR shall consult with PROJECT MANAGER on a case-by-case basis to get approval on how much removal will be acceptable based on the existing pipe diameter, flow, and overall condition of the pipe.

C. CONTRACTOR shall have all materials on site that are required to perform lining immediately after tubercules are removed to avoid any delay in necessary lining activities that could compromise the integrity of the host pipe.

3.3 ACCEPTANCE OF CLEANING OPERATION

A. Acceptance of sewer line cleaning shall be made upon the successful completion of the television survey and shall be to the satisfaction of the OWNER. Liner installation shall not be initiated until the OWNER has reviewed the post- cleaning television survey tapes and has accepted the cleaning. If television survey shows the cleaning to be unsatisfactory, the CONTRACTOR shall be required to reclean and reinspect the sewer line until the cleaning is shown to be satisfactory.

B. If special cleaning involving the mechanical removal of roots, grease, and/or tuberculation has been authorized, acceptance of sewer line cleaning shall be made upon the successful completion of the post-cleaning television survey and shall be to the satisfaction of the OWNER. Liner installation shall not be initiated until the OWNER has reviewed the post-cleaning television surveys and has accepted the cleaning.

C. In addition, all those lines which have sags or dips, to an extent that the television camera lens becomes submerged for three (3) or more feet during the television inspection, the CONTRACTOR shall pull down the water, or draft the water by means of high-velocity jet cleaners. Water removal shall be performed until the television camera lens will no longer submerge. This requirement may be waived by the OWNER if the water, in which camera lens is submerged is clear enough to allow the identification of pipe defects, cracks, holes and location of service taps.

END OF SECTION

SECTION 02752
PIPE INSPECTION (MAINS AND LATERALS)

PART 1 GENERAL

1.1 SCOPE

A. The work consists of furnishing all labor, materials, accessories, equipment, tools, transportation, services, and technical competence for performing all operations required to execute the survey to inspect the entire barrel of mainline sewers, the pipe connections to the manholes, the lateral connections, and lateral piping using pan and tilt cameras for both mains and laterals.

B. The survey shall show all defects and determine amount of infiltration entering the sewer system.

C. The inspection of mains and laterals shall conform to Section 01010, Part 3

1.2 GENERAL

A. After preparatory cleaning (including special cleaning involving the mechanical removal of roots, grease and/or tuberculation where authorized), and before and after rehabilitation work, the pipe sections shall be visually surveyed by means of closed-circuit television, the OWNER may be present at the inspections. The survey shall be performed one (1) manhole- to-manhole section or one (1) lateral at a time and the flow in the section being surveyed shall be suitably controlled to allow for complete quality view of the interior of the piping. Main lines shall be surveyed from the upstream manhole to the downstream manhole.

B. Preconstruction videos are those videos that the OWNER has requested of the CONTRACTOR to record before performing any repairs. Post construction videos are those videos taken after a repair. All videos shall be recorded in PACP, LACP formats and the associated reports are to be submitted, in color, indexed and tabulated to the OWNER. Only preconstruction videos as described above will be payable, all other videos (such as work videos, post videos) are to be included with their respective rehabilitation items in the bid form. Preconstruction videos will only be paid for once per line.

C. All inspection information furnished by the CONTRACTOR shall be written to digital media and shall be submitted in printed hardcopy and electric data format utilizing Wincan ™ VX or latest software version. The Wincan ™ software shall support the NASSCO PACP and LACP coding. The records shall include, but not be limited to the following for mains and laterals: graphic inspection reports, still pictures of each defect, still pictures above ground of all cleanout locations or projected cleanout locations and others as requested, above ground pictures of sonde locations, and infiltration reports. Main and lateral reports will at a minimum be required to have the following tabulated in a spreadsheet format acceptable to the OWNER: Lift station number, manhole numbers, main footage, lateral location on the main footage, side of the main the sewer lateral is located on as observed from the upstream manhole looking towards the downstream manhole, lateral count on the run, pipe sizes for all pipe being surveyed (mains and laterals), notation whether a cleanout is visible, lined or unlined pipe, house address (with lateral survey), LF surveyed, and the CONTRACTOR comments on the suggested rehabilitation required. All the reports, videos and suggestions are to be tabulated and turned in for the CITY to review.

D. The CONTRACTOR shall provide as built and data for all assets the CONTRACTOR works on in a fashion that it is compatible with the City Asset Management System "CityWorks". Delivery methods shall include desk top viewing and database import with minimal asset manipulation. Contractor shall package the data in WINCAM Vx software or later software version. Contractor is responsible to ensure the data generated by them is concordant with CITYWORKS asset management system. Any changes incurred by the contractor due to lack of coordination or preparation by the contractor, shall be corrected by the contractor at no cost to the City.

E. All video files and reports shall be labeled consistent with the OWNERs labeling system. Laterals shall be labeled in the following format: pump station ID, upstream MH#, distance from upstream MH, location of the lateral pipe (top, left or right). For example, a lateral in PS D43 located 23 feet from MH 21 on the right side of the line, as observed from the upstream manhole, would be labeled D43-21-23 R.

1.3 EQUIPMENT

A. The television cameras used for the surveys shall be specifically designed and constructed for the surveys and shall be of the pan and tilt type. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing a minimum line resolution color video picture. The CONTRACTOR shall always maintain camera in clear focus. Picture quality and definition shall be to the satisfaction of the OWNER; and if unsatisfactory, equipment shall be removed and replaced with adequate equipment so no additional cost to the OWNER.

B. The video camera shall include a title feature capable of showing on the tape the following information:

1. City and State
2. Date/Time
3. CONTRACTOR's Name
4. Line size, Material, and Depth
5. Manhole Identification (both manholes)
6. On-going Footage Counter

1.4 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings and other information. The CONTRACTOR's submittals shall include sample spreadsheet tabulation, sample video & reports for mains and laterals. No video surveys will take place until submittals are approved by the OWNER. The approved submittals will become the benchmark for all future video acceptance and or rejection. Rejected work will be redone at no additional cost to the OWNER.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 PRECONSTRUCTION SURVEY

A. Procedure

1. Prior to any repair work, the entire sewer line (from manhole to manhole) shall be televised. The camera shall be placed at the center of the manhole and videotaping shall commence prior to entering the pipe. The CONTRACTOR shall show the inside of the manhole walls and the pipe connection to the wall at both upstream and downstream manhole connections (ends of the pipe). The CONTRACTOR shall measure the inter-diameter of the pipe at both the upstream and downstream ends of the main pipe. If the pipe has been lined, the inter-diameter of the liner shall be reported on the CCTV log. The pipe diameter measurements shall be taken at twelve (12) inches inside the pipe from the manhole wall. Measurements shall be captured by using a laser measuring device or by taking a physical measurement using a caliper.

2. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case shall the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, powered rewinds and tractors or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If the camera is being pulled through the sewer line by a hydraulic cleaning unit hose the cleaning nozzle shall be located a minimum of eight (8) feet away from the camera to allow a clear, unobstructed view. Jet nozzle shall be used in front of camera while televising through a dip to draft out water. If, during the survey operation, the television camera will not pass through the entire pipe section, the CONTRACTOR shall set up his equipment so that the survey can be performed from the opposite manhole. No additional payment for this setup will be made.

3. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement meters shall be accurate to tenths of a foot over the length of the section being surveyed. Accuracy of distance meter shall be checked by use of a walking meter, roll-a-tape, electronic distance meter or other suitable device. Manhole numbers and linear footage shall be shown on screen during the video survey.

4. Movement of the television camera shall be temporarily halted for a minimum of five (5) seconds at each visible point source of infiltration and/or inflow until the leakage rate from the source is quantified. The camera shall be stopped at all service connections and the service lateral shall be inspected with the pan and tilt camera and look up the lateral and at the entire main/ lateral connection. The camera shall also be stopped at active service connections where flow is discharging. If the discharge persists, the property involved shall be checked to determine whether the discharge is sewage. If no flows are being discharged from the building, it shall be considered that the observed flow is infiltration/ inflow.

4. Lateral pipes should be inspected using a lateral launch camera having a pan/tilt camera and outfitted with a locatable sonde. whenever a lateral launch inspection is performed, the camera will be inserted from the downstream manhole and progress towards the upstream manhole (reverse setup) until the camera reaches the first lateral connection. The lateral launch camera located in the main pipe shall be robotically inserted into a lateral pipe, moving the camera through the lateral pipe to inspect the pipe. The inspection shall terminate when the camera reaches the private property line. Once the lateral camera reached the private property line the CONTRACTOR shall precisely locate the camera sonde and mark their location where a clean out is to be

installed (if one does not exist). The CONTRACTOR shall continue to inspect all lateral pipes connecting to the main pipe as described above. If a pipe defect is encountered that prevents the camera from continuing past the obstruction the CONTRACTOR shall locate the camera sonde and mark the location where a point repair needs to be made. Conforming to Section 02757 POINT REPAIR OF SANITARY SEWER.

B. Field Documentation

1. Television Inspection Forms (Survey Logs): Printed and electronically stored location records shall be kept by the CONTRACTOR and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during the survey. Upstream footage at face of manhole (0) and downstream footage at face of manhole (e.g., 250) shall be shown on the log. The television inspection forms to be utilized by the CONTRACTOR shall be those mandated by NASSCO's PACP and LACP. Both the "Header" and "Details" information on the form shall be entered as indicated in the PACP standards. The survey log shall include, but not be limited to the following information:

   a. Correct pipe segment/manhole numbers

   b. Correct address of manhole location

   c. Pipe size, length, and material

   d. Manhole depth (up and downstream)

   e. Lift station service area number

   f. Video number and index

   g. Footage locations, descriptions, and estimated leak rates for visible point sources of infiltration inflow.

   h. Footage locations and descriptions of structural defects such as obstructions, any remaining root intrusion, offset joints, cracked pipe, fractured pipe, holes, collapses, sags, protruding service connections and/or blockages in the pipe.

   The terminology to be used shall follow NASSCO's PACP and LACP standards. All information will be recorded, and a copy of such electronic records and a hard copy will be supplied to the OWNER, indexed, and tabulated.

2. Photographs: Digital photographs of the video shall be taken by the CONTRACTOR and included in the digital Wincan report. Photographs will include, pipe defects, manhole connections, lateral connections, property line cleanouts, or property line sonde locates. Above ground pictures of any sonde locates are to be included in the reports.

3. Locating: Sonde locating is required as a part of the CCTV survey for mains and laterals, to locate any point repairs that are necessary and to locate lateral piping for installing new cleanout or for locating existing cleanouts. Sonde locating from within the main and lateral piping shall be accurate within six (6) inches of any pipe defect, location marked for a cleanout installation, or any existing cleanout

4. Video Recordings: The purpose of video recording shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Recording playback shall be at the same speed that it was recorded. Slow motion or stop motion playback features shall be supplied by the CONTRACTOR. Once recorded, the video and reports become property of the OWNER. The CONTRACTOR shall have all video and necessary playback equipment readily accessible for review by the OWNER during the project.

Videos displaying poor video quality will be deemed unacceptable and no payments will be made until lines are re-televised and a new video is submitted. Poor quality refers to, but is not limited to, the following: grease or debris on the lens, camera underwater, picture too dark, excessive camera speed through the line, lines improperly cleaned, poor/no audio, etc.

5. Audio: All videos shall have audio record. As a preamble, at the beginning of the video, the CONTRACTOR shall state the following: "(CONTRACTOR's name) is performing at pre/post TV survey for job No. _____ (provided by the OWNER)". State the date, time, operators name, pump station area, upstream manhole number to downstream manhole number, pipe size and material, upstream manhole depth, and TV survey will be from up-to downstream or down-to upstream. The CONTRACTOR shall verbally state station and position of all laterals and defects. At the end of each line, state: "End of line", upstream manhole number to downstream manhole number, and total linear footage.

3.2 POST CONSTRUCTION SURVEY

A. Procedure

1. The same procedures shall be used as indicated in PRE-CONSTRUCTION SURVEY.

2. In addition, the CONTRACTOR shall stop camera at all point repairs, sectional repairs, lateral connection repairs and reinstated laterals, and inspect entire repaired pipe sections and all material ends and connections. Close attention is required for the inspection of all overlapping materials, manhole connections and lateral connections.

3. The CONTRACTOR shall invert white foreground to black as needed in the line section with light background.

4. In the case of a post-liner survey, the CONTRACTOR shall fully televise the ends of all the liners at the manholes, main/lateral connections and upstream lateral liner ends so that the finished ends of the line to the host pipe can be evaluated. During this post-liner survey, the CONTRACTOR shall also take necessary steps to visually record and confirm the placement of embedded gasket seals at each lateral connection, at the terminating end of the lateral, and at each manhole connection.

B. Documentation

1. The same documentation shall be provided as indicated in PRE-CONSTRUCTION SURVEY.

END OF SECTION

SECTION 02757
POINT REPAIR OF SANITARY SEWER

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The work specified in this section includes repairs to sections or segments (up to 15 feet) of existing sanitary sewers, mains, or service lines, which require excavation from the surface to accurately locate sources of infiltration or inflow and to eliminate them by making necessary repairs.

1.2 GENERAL

A. Methods, procedures, and requirements are similar when sections of existing pipe have been crushed, cracked, or settled, or have holes in them and are to be replaced with new pipe. Generally, point repairs are made at specific locations and involve relatively short lengths of sewer or fittings (up to 15 feet) which are to be repaired or replaced." Isolation" of the affected reaches of the sewer by plugging and/or bypass pumping, if required, shall be performed as specified in Section 02750 WASTEWATER FLOW CONTROL.

B. Locations where point repairs are to be made will be made available to the CONTRACTOR through Work Orders and will be based on previously performed smoke tests and television surveys. It is understood that the exact location of pipe leaks and failures cannot always be determined before the pipe is exposed because the smoke injected into the existing pipe to detect their presence can migrate through passages in the earth, and overburden, and may not emerge directly over the leak or failure.

C. It is also understood that the smoke testing and closed-circuit television surveys performed by others prior to the commencement of this project cannot always determine the precise cause of leakage or failure. The pipe shall be exposed, and the source located, examined, and evaluated before repairs are made. Additional smoke shall be introduced into the pipe by the CONTRACTOR to aid in the final evaluation and determination of required work, if necessary, to locate the area to be repaired.

D. After the designated repairs have been made, the CONTRACTOR will test them as described in this section of these specifications. The cost of testing will be borne by the CONTRACTOR period if a repaired joint or section should prove to be defective comma the CONTRACTOR shall re-perform the work at no additional costs to the OWNER and shall also be responsible for the costs of any re-testing required by the OWNER.

E. Where work is to be performed on private property, the CONTRACTOR shall consult with the OWNER who will plan and schedules with the property owners before the CONTRACTOR performs the work.

F. Excavation, backfill, exploratory excavation, sheeting and shoring, dewatering, conflicts with other utilities, and miscellaneous work shall conform to the requirements of Section 02316 EXCAVATION and 02315 FILL AND BACKFILL.

1.3 SUBMITTALS

A. CONTRACTOR shall submit shop drawings in accordance with Section 01300- SUBMITTALS

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe materials are specified in Section 02632-03, Polyvinyl Chloride (PVC).

PART 3 EXECUTION

3.1 PROCEDURES

A. The Point Repair procedures should be as follows:

1. Site preparation shall be performed as described in Division 2. When the repairs are to be made on sewers or facilities lying under paved surfaces, those surfaces shall be removed to the limits specified for Point Repairs of the size pipe involved (trench width plus two (2) feet for concrete surfaces) unless otherwise acceptable to the OWNER.

2. The CONTRACTOR shall excavate and backfill in accordance with Section 02316 - EXCAVATION and Section 02315 - FILL AND BACKFILL. Under no circumstances shall the CONTRACTOR be allowed to remove concrete or asphalt without prior cutting. The saw cutting shall be deep enough to produce and even, straight cut.

3. Dewater, sheet and/or brace all excavations in accordance with Section 02316 EXCAVATION and Section 02315 FILL AND BACKFILL. Well points, pumps, sheeting, bracing and/or sock drain shall be used to provide a safe, dry, open hole for all repairs or replacement specified herein.

4. Excavate down to the pipe, completely exposing the pipe up to the next undamaged section of pipe on each side.

5. Locate the pipe defect to be repaired.

6. After the pipe defect or structural failure is located and exposed, CONTRACTOR shall make recommendation and the OWNER will identify the method of rehabilitation. One or combination of the following methods shall be used:

a. Remove and replace section(s) of pipe or fitting. Remove section(s) of defective pipe or fitting by cutting on each side along lines perpendicular two longitudinal axis halfpipe so as not to leave "spigot ends" to be connected to replacement pipe. Cut or fabricate replacement section. Make connections between the existing pipe and the new pipe section using stainless steel non-shear pipe couplings. Bedding or embedment shall be placed and compacted. Reconnect service line if required. As a minimum, a total of six (6) feet of piping shall be replaced by the CONTRACTOR.

In the case of Point Repairs performed on service laterals, the CONTRACTOR shall:

1. Determine the exact location of the repair by means of television inspection with an electronic locating device (sonde).

2. If roots are encountered inside the lateral being repaired, a minimum of fifteen (15) feet of lateral shall be replaced.

3. If the pipe being replaced reached the private property line, a Cleanout shall be installed at that location in both the backyard and front yard easements.

7. Where the OWNER has indicated a fused-on saddle, sewer service connections shall be joined to the fold-and-formed pipe by means of electrofusion sewer saddle as manufactured by Central Plastics Company or approved equal.

8. The installation of the saddle shall be done in accordance with manufacturer's recommended procedures. The outlet shall be gasketed, sized for ASTM D3034 SDR 35 PVC pipe. The fusion of the saddle base must be achieved by input of 40 volts of current supplied by a micro-processor manufactured by Central Plastics Company or approved equal. The adequacy of point repairs and sewer mains shall be demonstrated by the CONTRACTOR by testing. Testing of means and services may be accomplished by one or two alternative methods depending on the depth of the line and the difference in elevation of the pipe at the ends of the reach. Smoke testing shall be used if the pipe slope exceeds 1%. Testing shall be performed while dewatering is continued and before backfilling.

   a. Smoke-Testing: The reach of sewer in which they repair (or repairs) has been made shall be isolated by plugging the upstream and downstream manholes as necessary not only to temporarily eliminate the flow of sewage through it but also to prohibit the smoke from entering other reaches of sewer. Smoke shall then be introduced into one of the manholes and into the reach using smoke bombs and a blower especially designed or adapted for smoke testing sanitary sewers and acceptable to the OWNER. The repaired area shall then be observed for the emergence of smoke for a period of 15 minutes. If none can be seen, their repair will be deemed to have passed the test.

   b. Exfiltration Testing: this method may be used only on sewers laid on grades less than 1.00%. Water, colored with a bright-color dye acceptable for usage and testing, is introduced into the pipe so as to impose a 2-foot static head over the top of the pipe at the point of repair when the pipe in the lower manhole is plugged. Observations shall then be made by the OWNER to determine if leakage of the colored water occurs at the repair point. Care shall be taken, when this method is used, that:

      1. Not more than four (4) feet of static head are induced on the main at the lower end of the reach, and
      2. No back-up problems are caused in service lines.

8. Complete placement and compaction of backfill.

9. Restore surface features to at least good condition as existed before construction began, including roadways, driveway, and walks.

3.2 TELEVISION SURVEY

A. Television survey, including pre-construction survey and post construction survey as indicated in Section 02752 PIPE INSPECTION (MAINS AND LATERALS)

END OF SECTION

SECTION 02758
SANITARY SEWER DOUBLE WYE SERVICE CONNECTION

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The work specified in this section includes repairs to sections or segments (up to 15 feet) of existing sanitary sewer service lines, which will require excavation from the surface to accurately locate existing staggard wye connections and to replace them by making necessary repairs.

1.2 GENERAL

A. Generally, double service connection replacements are made at specific locations and involve relatively short lengths of sewer and fittings (up to 15 feet) which are to be repaired or replaced. "Isolation" of affected reaches of sewer by plugging and/or bypass pumping, if required, shall be performed as specified in Section 02750 WASTEWATER FLOW CONTROL.

B. Locations where double service connections are to be made will be made available to CONTRACTOR through Work Orders and will be based on previously performed television surveys.

C. After the designated repairs have been made, the CONTRACTOR will test them as described in this section of these Specifications. The cost of testing will be borne by the CONTRACTOR. If a repaired joint or section should prove to be effective, the CONTRACTOR shall re perform the work at no additional cost to the OWNER and shall also be responsible for the cost of any re-testing required by the OWNER.

D. Where work is to be performed on private property, the CONTRACTOR shall consult with the OWNER who will plan and schedules with the property owners before the CONTRACTOR performs the work.

E. Excavation, backfill, exploratory excavation, sheeting and shoring, dewatering conflicts with other utilities, and miscellaneous work shall conform to the requirements of Section 02316 EXCAVATION and 02315 FILL AND BACKFILL.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings in accordance with Section 01300 SUBMITTALS.

PART 2 PRODUCTS

2.1 MATERIALS

A. Pipe materials are specified in section 02632-03 Polyvinyl Chloride (PVC)

PART 3 EXECUTION

3.1 PROCEDURES

A. The double service connection replacement procedures shall be as follows:

1. Site preparation shall be performed as described in division 2. When the repairs are to be made on sewers or facilities lying under paved surfaces, those services shall be removed to the limits specified for Point Repairs of the size pipe involved (trench width +2 feet for concrete surfaces) unless otherwise acceptable to the OWNER.

2. The CONTRACTOR shall excavate and backfill in accordance with SECTION 02316 EXCAVATION AND SECTION 02315 FILL AND BACKFILL. Under no circumstances shall the CONTRACTOR be allowed to remove concrete or asphalt without prior cutting. The saw cutting shall be deep enough to produce and even, straight cut.
3. Dewater, sheet and/or brace all excavations in accordance with Section 02316 EXCAVATION and Section 02315 FILL and BACKFILL. Wellpoints, pumps, sheeting, bracing and/or sock drain shall be used to provide a safe, dry, open hole for all repairs or replacements specified herein.

4. Excavate down to the pipe, completely exposing the least footage of pipe necessary to locate and replace both existing staggered wyes.

5. After the staggered wyes are located and exposed, CONTRACTOR shall make recommendation and the OWNER will identify the method of replacement. One or a combination of the following methods shall be used:

    a. Remove and replace section(s) of pipe and fittings: Remove section(s) of defective pipe or fitting by cutting on each side along lines perpendicular to longitudinal axis of pipe to leave "spigot ends" to be connected to replacement pipe. Cut or fabricate replacement section. Make connections using stainless steel non-shear couplings. Bedding or embedment shall be placed and compacted. Reconnect to service line. As a minimum, a total of six (6) feet of piping shall be replaced by the CONTRACTOR.

        CONTRACTOR shall:

        1. Determine the exact location of the wyes by means of television inspection with an electronic locating device (sonde).

        2. If roots are encountered inside the lateral being repaired, a minimum of 15 feet of lateral shall be replaced.

        3. A two (2) way Cleanout shall be installed at or near the property line on each leg of the wye (see standard detail S216). Location can exist in both the back and front yard easements.

        4. Where the OWNER has indicated a fused-on saddle, sewer service connections shall be joined to the fold-and-formed pipe by means event electrofusion sewer saddle manufactured by Central Plastics Company or approved equal. The installation of the saddle shall be done in accordance with the manufacturer's recommended procedures. The outlet shall be gasketed, sized for ASTM D3034 SDR 35 PVC pipe. The fusion of the saddle base must be achieved using 40 volts of current supplied by a micro-processor manufactured by Central Plastics Company or approved equal.

6. The adequacy of the double wye service connection in sewer laterals shall be demonstrated by the CONTRACTOR by testing. Testing of services may be accomplished by one of the two alternate methods, depending on the depth of the pipeline and the difference in elevation of the pipe at the ends of the reach. Smoke testing shall be used if the pipe slope exceeds 1%. Testing shall be performed while dewatering is continued before backfilling.

    A. Smoke Testing: The reach of lateral pipe in which the repair (or repairs) has been made shall be isolated by plugging the lower section of the lateral by inserting an inflatable plug through a clean out and position the plug

downstream of the repaired pipe section. A second plug shall be inserted through a clean out and positioned in the lateral pipe in the upstream side of the clean out. Smoke shall then be introduced into one of the cleanouts using smoke bombs and a blower especially designed or adapted for smoke testing sanitary sewers and acceptable to the OWNER. The repaired area shall be observed for the emergence of smoke for a period of 5 minutes. If none can be seen, the repair will be deemed to have passed the test.

B. Exfiltration Testing: this method may be used only on sewers laid on grades less than 1.00%. Water, colored with a bright-colored dye acceptable for usage in testing, is introduced into the pipe to impose a 2-foot static head over the top of the pipe at the point of repair when the pipe in the lower manhole is plugged. Observations shall then be made by the OWNER to determine if leakage of the colored water occurs at the repair point. Care shall be taken, when this method is used, that:

1. Not more than four (4)-feet of static head are induced on the main at the lower end of the reach, and
2. No backup problems are caused in service lines.

8. Complete placement and compaction of backfill.

9. Restore surface features to at least as good condition as existed before construction began, including roadways, driveway, and walks.

3.2 TELEVISION SURVEY

A. Television survey, including pre-construction survey and post-construction survey as indicated in Section 02752 PIPE INSPECTION MAINS AND LATERALS.

END OF SECTION

SECTION 02759
SANITARY CLEANOUT

PART 1 GENERAL

1.1 SCOPE

A. This section consists of excavating a section of the existing sewer lateral pipe between main line and a property line, and the furnishing, installing, testing, and placing in operation new sewer service cleanout piping, complete in its place, with fittings, and other appurtenances required for a complete installation per CITY standard details. This section requires the new cleanout to provide two (2) way access in the service pipe.

B. A sanitary cleanout installation shall confirm to Section 01010, Part 3, and CITY standard details.

1.2 GENERAL INFORMATION AND DESCRIPTION

A. The pipe and fittings covered by these specifications shall be furnished by fully qualified manufacturers experienced in the fabrication, casting and manufacture of the pipe materials specified herein. The pipe and fittings shall be designed, fabricated and installed in accordance with the best practice of trade and the standards specified herein.

B. Portions of existing sanitary sewer service lines shall be excavated to install a two (2) way sanitary cleanout as directed by the OWNER. Where necessary and directed by the OWNER, the CONTRACTOR is to remove test tees, roots, double wyes, or defective pipe as required within the area of a cleanout installation. A clean- out installation "area" is to include up to 5' of lateral pipe replacement.

C. Replacement pipe at the property line including cleanout as approved by the OWNER per OWNER's minimum standards shall be the same size. Refer to the City's standard details for the "Standard Cleanout Detail."

D. The CONTRACTOR may furnish as an alternative to traditional excavation, vacuumed excavation with a Snap-On sewer saddle that conforms to ASTM F3097 and complies with Section 02760 Vac-A-Tee or approved equal, approved by the OWNER.

E. The CONTRACTOR shall submit shop drawings for all materials, couplings, fittings, pipe, cleanout boxes, concrete pads or any other item required for the cleanout installation.

F. The CONTRACTOR shall furnish all labor, tools, materials, and equipment necessary for installation and jointing of the pipe. All piping shall be installed in accordance with the Contract Documents in a neat workmanlike manner and shall be set for accurate line and elevation. All piping shall be thoroughly cleaned before installation, and care shall be taken to keep the piping clean throughout the installation, no foreign material is to be allowed to enter the system.

G The existing laterals shall be hand excavated to a joint, sawcut, clean and square and the appropriate adapter installed to connect the replacement laterals. Care shall be taken to maintain the slopes of the existing laterals.

H. The CONTRACTOR is to maintain traffic so that it causes minimal disruption to the public. Any road closure or work in the public Right-of-way will require an approval prior to work commencing.

PART 2 PRODUCTS

2.1 PIPE-TO-PIPE CONNECTIONS

A. Pipe-to-pipe connections shall be made by using stainless steel non-shear couplings ~~as~~ manufactured by Fernco or approved equal.

B. Review the standard cleanout installation CITY standard details drawings for the required materials for construction of a cleanout, surface restoration, Cleanout box and pad requirements.

PART 3 EXECUTION

3.1 GENERAL

A. After the site has been located for a particular cleanout installation which is to be installed, operations shall progress generally as follows:

1. Call for locations of existing utilities, Sunshine State One- Call, 811. No excavations are to be done without proper locations.

2. Take photographs of the area prior to the excavations and after the excavation and restoration is completed. The photographs will be used in case there is the discrepancy in the restoration required.

3. Carefully remove or protect surface features in work area. Excavate to completely expose the existing pipe, taking adequate precautions not to disturb any other existing underground facilities and handling excavated materials in a manner that will not cause further restoration.

4. The section or reach of pipe being worked on shall be isolated by plugging and/or bypass pumping where necessary. There is no payment for bypass pumping for this section of work any bypassing required is to be included in the bid item for cleanout installation.

5. Remove and dispose of existing pipe as necessary, no foreign materials are to be backfilled in the trench.

6. The trench bottom shall be over excavated a minimum of 8-inches and new embedment material to go beneath the pipe placed and shaped to form uniform support for the pipe barrel and newly installed cleanout.

7. Pipe shall be installed in accordance with the manufacturer's recommendations and to the grade and slope as its existing condition. Pipe shall be installed and jointed, normally beginning at its low or outlet end proceeding upstream, with the bell ends facing upstream toward the direction of flow. Complete embedment or encasement and place compacted backfill as necessary to avoid pipe settlement during backfilling or compaction. Any pipe connection found to be leaking, offset, improperly cut, or aligned will be re excavated and replaced at no additional charge to the OWNER.

8. Perform leakage test if requested. When this has been successfully completed and acceptable to the OWNER, remove temporary plugs and reconnect wyes or tees to service lines.

9. Complete placement and compaction backfill.

10. Restore surface features to at least as good condition as existed before construction began, including roadways, driveways, and walks.

11. Excavated cleanouts: restoration items, sod, asphalt, or concrete. These items are limited to a maximum of 5'x 5' restoration area. For excavations deeper than five (5) feet the restoration area will increase by one (1) foot for each additional foot of excavation depth beyond six (6) feet. Payment for restoration items will not exceed the dimensions of the existing item being restored. Actual field measurements will be paid up to the preceding maximum dimensions. The CONTRACTOR is directed to adjust his restoration items to include the "limits of construction" restrictions, any restoration required outside of these limits will be considered the CONTRACTOR's responsibility unless approved by the OWNER in writing prior to restoration work.

END OF SECTION

SECTION 02760
MINIMALLY INVASIVE SANITARY SEWER CLEANOUT (MISC)

PART 1 GENERAL

1.1 SCOPE

A. This section consists of furnishing a minimally invasive sanitary clean out (MISC) on a section of the existing sewer lateral pipe, between main line and a property line, including furnishing, installing, testing, and placing in operation new sewer service clean out piping, complete in place. The installation shall include fittings, and other appurtenances required for a complete installation with minimal excavation and same day site restoration.

B. The CONTRACTOR shall furnish and install, as an alternate to traditional excavation, a vacuum excavated snap-on sewer saddle, including installing a Vac-a-Tee ® or approved equivalent, on the existing lateral pipe, at an approved location to create a cleanout, where approved by the OWNER.

C. A minimally invasive sanitary sewer cleanout installation shall conform to Section 01010, Part 3, and CITY cleanout standard details

1.2 GENERAL INFORMATION AND DESCRIPTION

A. The saddle, riser pipe and fittings, required for a complete installation of the MISC, shall be furnished by fully qualified manufacturers experienced in the fabrication, casting and manufacture of the pipe materials specified herein. The pipe and fittings shall be designed, fabricated, and installed in accordance with the best practice of the trade and the standards specified herein and CITY OF FORT LAUDERDALE standard details

B. The CONTRACTOR shall establish the location of the new MISC by the most effective means available including CCTV inspection equipment and location sondes as applicable, marking the lateral cleanout location with GPS coordinates. GPS coordinates (latitude and longitude) for the new cleanout location must be provided to the OWNER as part of the documentation to be submitted documenting such construction.

C. Using marking paint, three (3) white paint marks, each resembling a "dot" shall be made, each 18- inches apart and shall be on the line of the pipe. The center mark shall be the precise location where the borehole will be made for the MISC.

D. Using marking paint, a white box measuring 3'x3' shall be marked around the three dots. This allows for identification and a location, where the borehole will be made for the MISC.

E. A photograph of the three dots and white box shall be taken and provided to the OWNER as a deliverable item.

F. The CONTRACTOR shall submit shop drawings for all materials, required for the MISC installation.

G. The CONTRACTOR shall furnish all labor, tools, materials, and equipment necessary for a complete MISC installation and installed in a neat workmanlike manner and shall be set for accurate line and elevation. Care shall be taken to keep saddle and riser pipe clean throughout the installation, no foreign material is to be allowed, to enter the system.

H. The CONTRACTOR is to maintain traffic, if applicable, so that MISC installation causes minimal disruption to the public. Any road closure or work in the public Right-of-way will require an approved MOT prior to work commencing.

I. Call for locations of existing utilities, Sunshine State One-Call, 811. No excavations are to be done without proper locations.

PART 2 PRODUCTS

A. Saddle shall be a one-piece, molded PVC and shall be compatible with the PVC riser pipe. The saddle shall conform to the existing lateral pipe when installed together with resin adhesive and by a snap-on-fit.

B. The molded PVC saddle should be designed to fit 4-inch or 6-inch diameter pipe and shall be SDR 35.

C. The riser pipe shall be PVC and shall be the same pipe diameter as the lateral pipe.

D. The resin adhesive shall be a one-part marine grade adhesive/sealant designed for the specific application of a Vac-a-Tee® system or approved equal, connected to a sewer lateral pipe

E. The cleanout cap shall be as approved by the OWNER.

PART 3 EXECUTION

3.1 GENERAL

A. After the site has been located for a MISC, installation shall generally proceed by the following order of operations.

B. INSTALLATION

1. Surface material removal - In grass areas, the sod shall be neatly cut, removed properly maintained for restoration installation.

2. In pavement areas, the surface shall be straight- line marked, cut and removed, or as an alternate, a 24" diameter diamond core saw may be used to reduce surface disruption and restoration.

3. A borehole shall be made using a compressed air or water to loosen the soil in combination with an industrial vacuum excavation truck. The CONTRACTOR shall carefully remove the soil surrounding the lateral pipe to a depth equal to the invert level of the pipe. All spoils shall be deposited in the vacuum truck.

4. The PVC riser pipe of the required length and diameter size shall be solvent welded to the molded saddle.

5. The adhesive/sealant shall be applied to the underside surface of the saddle, which will make contact with the exposed lateral pipe, at no less than a thickness of ¼" layer.

6. The saddle and riser pipe shall be carefully inserted into the borehole, setting the saddle onto the pipe, applying a downward force, causing the saddle to expand and snap onto the lateral pipe.

7. Immediately after the saddle has been affixed to the lateral pipe, the riser pipe should be secured by backfilling the borehole.

a. The annular space between the borehole and the riser pipe shall be backfilled with approved excavated material, granular material or as otherwise approved by the OWNER.

b. The approved backfill material shall be installed in six-inch lifts, and each six-inch lift shall be separately compacted, in a manner approved by the OWNER, to at least 95% AASHTO. Excavated material should only be used when the owner has determined that said material is clean, dry and can pass compaction requirements. Backfilling should be complete at the level of the surface finish material installation, whether that be concrete, asphalt or other material.

8. Approximately 4 ounces of water shall be introduced into the secured riser pipe to activate the adhesive/sealant between the molded saddle and the riser pipe whereupon and approved clean out casting/cap shall be installed.

3.2 SURFACE RESTORATION

A. Surface restoration for installations in sod and paved surface areas 24-inches or less that where core sawed shall be accomplished the same day the cleanout is installed. All other surface restorations which include new concrete sidewalks and driveways, custom paver bricks, asphalt and unique landscaped areas, additional time will be allowed for completion of restoration.

B. All concrete restorations measuring 24- inches in diameter or less shall include three (3) dowels evenly spaced using an 8-inch piece of #4 rebar drilled and pounded into each hole so that approximately four (4) inches of said rebar is embedded in the surface material and four (4) inches protrudes into the area to be filled. The cleanout casting as prescribed by the OWNER shall then be set, and the area filled with material that matches the existing surface that is being restored. The surface restoration materials shall match the original grade, performance, and appearance of the original surface area.

3.3 TESTING AND CUTTING

A. Prior to coring for accessing the lateral pipe, an exfiltration water test shall be performed. This is accomplished by filling the riser pipe with a maximum 6-foot column of water. The test shall be performed no less than 12 hours from the time of affixing the saddle to the pipe. The column of water shall be left for a minimum of five (5) minute period. No drop in water elevation will be allowed. The coupon shall not be cored until a verifiable non-leaking connection has been confirmed. Should the leak test fail, a repair is made by injecting a slow viscosity resin or chemical grout between the saddle and the pipe. The leak test is repeated until a watertight connection can be confirmed.

B. Once the exfiltration test has been successfully completed, the crown of the lateral pipe is cored by means of a powered core saw that is inserted down the riser pipe into contact with the crown of the pipe removing the coupon within the coring saw.

3.4 PAYMENT

A. Payment for MISC shall be for each cleanout installed, complete and shall include all materials, installation labor and all restoration within the limits of the MISC installation. Any restoration required outside of these limits will be considered the CONTRACTOR's responsibility, unless approved by the OWNER in writing prior to the performance of the additional restoration work. OWNER will not be responsible for unapproved restoration.

3.5 FINAL

A. Upon completion, the CONTRACTOR shall provide GPS location coordinates of the new MISC and a photograph of the restored site.

END OF SECTION

SECTION 02764
CURED-IN-PLACE SECTIONAL PIPE LINING

PART 1 GENERAL

1.1 SCOPE

A. The work specified in this section consists of rehabilitating existing sanitary sewer pipe by installing a resin impregnated fiberglass/polyester felt tube into an existing pipe to restore its structural and hydraulic integrity.

1.2 GENERAL

A. The finished sectional pipe liner in place shall be fabricated from materials which, when installed, will be chemically resistant to withstand internal exposure to domestic sewage.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings and other information to the OWNER for review in accordance with Section 01300 SUBMITTALS. Included shall be design calculations for the work.

1.4 QUALIFICATIONS

A. The qualifications of the CONTRACTOR shall be submitted prior to contract award. These qualifications shall include detailed descriptions of the following:

1. Name, business address and telephone number of the CONTRACTOR.

2. Name(s) of all supervisory personnel to be directly involved with this project.
3. The CONTRACTOR shall sign and date the information provided and certify to the extent of his knowledge, the information is true and accurate, and that the supervisory personnel will be directly involved with and used on this project. Substitutions of personnel and/or methods will not be allowed without written authorization of the OWNER.

4. Specialty technicians shall be certified by the equipment manufacturer and/or its authorized representative. Certifications shall be submitted to the OWNER.

5. The CONTRACTOR (the company bidding, not individuals) shall provide his references of previous project lists going back five (5) years including his customers names addresses and telephone numbers.

6. To be acceptable, a minimum of 500 sectional liner installations must be documented.

7. To be acceptable, the installer must have had a minimum of five (5) years active experience to the commercial installation of the product.

PART 2 PRODUCTS

2.1 GENERAL

A. The finished liner shall be fabricated from material as specified in this section which when cured

will be chemically resistant to the corrosive effects of the raw sewage and hydrogen sulfide.

B. The CONTRACTOR shall submit shop drawings, samples of materials, and design calculations to the OWNER for review.

2.2 LINER SIZING

A. The liner shall be fabricated to a size that when installed will neatly fit the internal circumference of the conduit to be repaired as specified by the OWNER.

B. The length and number of liners shall be that deemed necessary by OWNER to effectively carry out the repairs. The CONTRACTOR shall verify the lengths in the field before cutting liner to length. The minimum length shall be 8-feet and cover a minimum of 6- inches on either side of the pipe joints.

2.3 LINER MATERIAL

A. The tube will consist of one (1) or more layers of flexible needled felt or an equivalent non-woven material. The tube will be continuous in length exhibiting a uniform minimum wall thickness based upon design calculations found in ASTM F1216 Appendix XI. No overlapping sections shall be allowed in the circumference or length of the liner. The tube will be capable of conforming to offset joints, bells, and disfigured pipe sections.

B. The resin will be polyester, vinyl or epoxy ester with proper catalysts as designed for the specific application.

C. The Sectional Liner seal shall be installed with **Insignia Seals** at the liner end seated on sound pipe so that when compressed there is a compression gasket seal. Insignia seals or equal must be used, use of hydrophilic paste or caulk will not be permitted.

D. The cured resin material shall have the following properties:

Item	**Test Value**	**Reference Standard**
Flexural Strength	4,500 psi	ASTM D790
Flexural Modulus	250,000 psi	ASTM D790

2.4 LINER DESIGN

A. The required structural CIPP wall thickness shall be based at a minimum, on the physical properties described above and in accordance with the design equations in the appendix of ASTM F1216, in the following design parameters:

Property	**Test Method**	**Results**
Flexural Stress	ASTM D-790 (short term)	4,500 psi
Modulus of Elasticity	ASTM D-790	250,000 psi

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design	50%
Ovality*	2%
Groundwater Depth= Pipe Depth (above invert) *	ft.
Soil Depth (above crown) *	ft.
Soil Modulus	700 psi
Soil Density	120 pcf
Live Load	Two H20 passing trucks

Design Condition	Fully deteriorated

* *Denotes information which can be provided here or in inspection videotapes or project construction plans. Multiple line segments may require a table of values.*

B. The lining manufacturer shall submit the OWNER for review complete design calculations for the liner(s), signed and sealed by a professional ENGINEER registered in the State of Florida and certified by the manufacturer as to the compliance of his materials to the values used in the calculations. A safety factor of two (2) should be applied in the design calculation. The host pipe should be considered fully deteriorated. The liner shall be designed to withstand a live load equivalent to two H-20 passing truck plus all pertinent dead loads, hydrostatic pressure, and grout pressure (if any). For design purposes, the water table shall be considered at grade elevation. The liner shall be designed in accordance with ASTM F-1216. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure, and grout pressure (if any) the liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700 psi, corresponding to a moderate degree of compaction of bedding and fine-grained soil as shown in AWWA Manual M45, Fiberglass Pipe Design.

C. Liner shall be neither accepted nor installed until design calculations are acceptable to the OWNER.

2.5 REFERENCES

A. ASTM F2599- The Sectional Repair of Damaged Pipe by Means of an Inverted Cured-in-Place Pipe.

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

C. ASTM D-790- Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

D. ASTM D-792 – Standard Test Methods for Density and Specific Gravity of Plastics by displacement.

E. ASTM D-2990 – Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep Rupture of Plastics.

F. ASTM D5813 – Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe.

PART 3 EXECUTION

3.1 CLEANING SEWER LINES

A. Prior to any lining of a pipe so designated, it shall be the responsibility of the CONTRACTOR to remove internal deposits from the pipeline in accordance with Section 02751 PREPARATORY CLEANING, ROOT AND TUBERCULATION REMOVAL.

3.2 TELEVISION SURVEY

A. Television survey shall be performed in accordance with Section 02752 PIPE INSPECTION (MAINS AND LATERALS).

B. The interior of the pipeline shall be carefully surveyed to determine the locations and extent of any structural failures. The location of any conditions which may prevent proper installation of

lining materials into the pipelines shall be noted so that these conditions can be corrected. A video tape and suitable log shall be kept and turned over to the OWNER.

C. For the sewer line with sectional cured-in-place liner installed, a variance for post-TV and tapes shall be allowed as follows:

1. The post-rehabilitation CCTV shall commence at the upstream manhole (downstream for reverse setups) and shall proceed at a maximum speed of 30-feet per minute until the repair is reached. No panning of defects or laterals need to be done. Upon reaching the sectional liner, the CONTRACTOR shall stop and carefully pan the beginning and the end of the liner to show the repair has been successfully completed. If a lateral connection has been lined over and reopened, the CONTRACTOR shall pan this opening and the lateral. The rest of the line shall be televised without stopping until the downstream manhole has been reached.

2. One log (pre-rehabilitation CCTV log) shall be furnished with a statement under the comments line as to the linear footage of the beginning of the sectional liner, the length of the liner, and the number of laterals reinstated (if any), and their location.

3.3 FLOW BYPASSING

A. The CONTRACTOR when required, shall provide for transfer of flow, through or around a section or sections of pipe that are to be repaired. The proposed bypassing system shall be acceptable in advance by the OWNER. The acceptance of this bypassing system in advance by the OWNER shall in no way relieve the CONTRACTOR of his responsibility and/or public liability. The flow bypassing shall be done in accordance with Section 02750 WASTEWATER FLOW CONTROL

3.4 LINER OBSTRUCTIONS

A. It shall be the responsibility of the CONTRACTOR to clear the line of obstruction. If survey reveals an obstruction that cannot be removed by conventional cleaning equipment, the CONTRACTOR shall make a point repair excavation in accordance with Section 02757 POINT REPAIR OF SANITARY SEWERS, to uncover and remove or repair the obstruction. Such excavation shall be accepted in writing by the OWNER prior to the commencement of the work.

3.5 LINER INSTALLATION

A. Prior to liner installation, all active severe leaks which may affect the success of liner installation shall be stopped using chemical grout. The contractor shall impregnate the liner. Drop cloths, tarpaulins, etc. shall be used to prevent material from contacting the adjacent ground. Place the liner on the placement carriage and maneuver carriage and liner into position with the use of a video camera. Forced the liner against the wall of the damaged hose pipe allowing epoxy resin to permeate into any cracks in the host pipe. Allow lines to cure for approximately two (2) hours in accordance with the manufacturer's recommendations. Heat may be the introduced to speed up curing time. Retract the placement carriage and remove from pipe.

B. After the sectional liner has been cured in place, the CONTRACTOR shall reconnect the service connections if required. Cutting of the liner pipe shall be done from the interior of the pipeline using a robotic cutter. Where holes are cut through the liner, they shall be neat and smooth to prevent blockage at the service connections. Cut-in service connections shall be opened to a minimum of 95% of the flow capacity of the building sewer. Cuts shall be wire-brushed to remove jagged edges. All coupons shall be recovered at the downstream manhole and removed. All reinstated service lateral connections (between the liner and the existing pipe) shall be grouted. The reinstatement of the service connections shall be a separate pay item.

3.6 ACCEPTANCE

A. The finish liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and alike. There shall be no visible infiltration through the liner or from behind the liner.

3.7 CLEANUP

A. After the liner installation has been completed and accepted, the CONTRACTOR shall clean up the entire project area and return the ground cover to grade. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.8 WARRANTY

A. The liner shall be certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for five (5) years from the date of acceptance. During the warranty period, any defects which affect the integrity or strength of the pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the OWNER and the CONTRACTOR.

END OF SECTION

SECTION 02765

CURED-IN-PLACE PIPE LINING - Main

PART 1 GENERAL

1.1 SCOPE

A. It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube which is formed to the original conduit and cured to produce a continuous and tight fitting Cured-In-Place Pipe (CIPP)

B. The work specified in this section includes all labor, materials, accessories, equipment, and tools necessary to install and test Cured-in-Place Pipe lining in main lines and in service laterals that connect to a manhole or a section of lateral pipe that does not require a connection to the main pipe.

C. Cured-in-Place Pipe Lining shall conform to Section 01010, Part 3.

1.2 GENERAL

A. This specification references ASTM F1216 (Rehabilitation of pipelines by the inversion and carrying of a resin-impregnated tube), ASTM F1743 (rehabilitation of pipelines by pulled-in-place installation of a cured-in-place thermosetting resin pipe), and ASTM D790 (Test methods for flexural properties on unreinforced plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

1.3 SUBMITTALS

A. The CONTRACTOR shall submit shop drawings and other information to the OWNER for review in accordance with Section 01300 SUBMITTALS.

B. With the bid, the following submittals are required:

1. Documentation is outlined herein under the section titled, PRODUCT AND INSTALLER ACCEPTABILITY, including installation references of projects that are similar in size and scope to this project. The submittal shall include, at a minimum, the client contact name, phone number, and the diameter and footage of the pipe rehabilitated. Documentation for product and installation experience must be satisfactory to the OWNER.

C. After contract award, the following submittals are required:

1. Detailed design calculations as specified herein under the Section titled MATERIALS FOR MAIN LINES.

2. Various test results as specified herein under the Section titled, TESTING REQUIREMENTS.

3. Documentation as specified here in under the Section titled WET-OUT AND CURE REPORT AND TELEVISION SURVEY.

4. Manufacturer's product requirements including recommended Cure Schedule, recommended liner installation and cure pressure limitations, recommended resin volumes for tube saturation.

1.4 PRODUCT AND INSTALLER ACCEPTABILITY

A. Since sewer products are intended to have a 50-year design life, and to minimize the OWNER's risk, only proven products and installers with substantial successful long term track records will be approved.

B. Products and installers seeking approval must document and the ability to meet all the following criteria to be deemed commercially acceptable:

1. For a product to be considered commercially proven, a minimum of 500,000 linear feet or 2000 manhole-to-manhole line sections of successful wastewater collection system installations in the U.S. must be documented to the satisfaction of the OWNER to assure commercial viability. In addition, at least 250,000 linear feet other product shall have been successful service within the State of Florida for a minimum of five (5) years.
2. For an installer to be considered as commercially proven, the installer must satisfy all insurance, financial, and bonding requirements of the OWNER, and must have had at least five (5) years active experience in the commercial installation of the product in Florida. For sewer mains, the installer must have successfully installed at least 250,000 feet of the product in wastewater collection systems in Florida.
3. Sewer rehabilitation products submitted for approval must provide third-party test results supporting the long-term performance in structural strength of the product and such data shall be satisfactory to the OWNER. Test samples shall be prepared to stimulate installation methods and trauma of the product. **No product will be approved without independent third-party testing verification.**

PART 2 PRODUCTS

2.1 MATERIALS FOR MAIN LINES

A. The sewn tube shall consist of one or more layers of absorbent non-woven felt fabric and meet the requirements of ASTM F1216 or ASTM F1743, Section 5. The tubes shall be constructed to withstand installation pressures, have sufficient strength to bridge breaks and missing sections of the existing pipe, and stretched to fit irregular pipe sections. The new jointless pipe-within-a-pipe must fit tightly against the old pipe wall and consolidate all disconnected sections into a single continuous conduit, substantially reducing or eliminating infiltration or exfiltration.

B. The wet-out tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the design thickness.

C. The tube shall be sewn to a size that one installed will tightly fit the internal circumference and length of the original pipe with minimal shrinkage, in such a way as to minimize water migration (tracking) between the liner and the host pipe. Allowance should be made for circumferential stretching during inversion, and longitudinal stretching during pull in. Overlapping layers of felt or longitudinal seems that cause lumps in the final product shall not be utilized.

D. The minimum tube length shall be that deemed necessary by the CONTRACTOR to effectively span the distance between the access points and to facilitate a good, close-fitting pipe-within a pipe. The CONTRACTOR shall verify the length in the field before cutting liner to length and otherwise preparing it for installation.

E. The outside layer of the tube (before wet-out) shall be coated with an impermeable, flexible membrane compatible with the proposed resin and curing temperature, that will contain the resin and facilitate monitoring of resin saturation during the resin impregnation (wet-out) procedure.

F. The tube should be homogeneous across the entire wall thickness containing no intermediate

or encapsulated elastomeric layers. No material shall be included in the tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident when delivered to the project site for installation.

G. The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment may be made.

H. Seams in the tube shall be stronger then the unseamed felt. Relative test results shall be submitted to the OWNER.

I. The outside of the tube shall be marked for distance at regular intervals along its entire length, not exceeding five (5) feet. Such markings shall include the manufacturers name or identifying symbol. The tubes must be manufactured in the USA and marked accordingly.

J. CONTRACTOR is to install Hydrophilic end seal sleeves at all manhole penetrations. The end seals must be a tubular form which, when installed, will form a 360-degree sealed between the host pipe and the newly installed liner and must be a minimum of three (3) inches wide. The use of caulking, rope or band type of an end seal will not be allowed. Acceptable end seals are Insignia™ End Seals by LMK Technologies, 1779 Chessie Lane, Ottawa Illinois 61350 (815) 433-1275, or pre-approved equal.

K. If the end of the host pipe is cracked or otherwise damaged at the connection to the manhole such that a watertight fit cannot be achieved solely using Insignia End Seals, the CONTRACTOR shall repair or rebuild the damaged section using an approved quick setting hydraulic cement prior to the installation of the end seals and the CIPP. The CONTRACTOR shall ensure the pipe and end seals are in good condition to form a watertight seal before any CIPP is installed.

L. The resin system shall be a corrosion resistant polyester, vinyl ester, or epoxy and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 and ASTM F1743, meets the physical properties here in, and those which are to be utilized in the design of the CIPP for this project. The resin shall produce CIPP which will comply with the structural and chemical resistance requirements of this Specification.

M. Finished pipe in place shall be fabricated from materials which when cured will be chemically resistant to withstand internal exposure to domestic sewage. All constituent materials shall be suitable for service and the environment intended. The final product will not deteriorate, corrode, or lose structural strength that will reduce the projected product design and service life. In industrial areas a liner system using epoxy vinyl ester resin shall be utilized and a polyester resin shall be used in non-industrial areas. The OWNER shall determine the type of appropriate resin to be utilized for each line segment.

N. The CIPP shall be designed per ASTM F1216, Appendix X1. The CIPP design shall assume no bonding to the original pipe wall. The structural performance of the finished pipe must be adequate to accommodate all anticipated loads throughout its design life.

O. The CIPP must have a minimum design life of fifty (50) years. The minimum design life may be documented by submitting life estimates by national and/or international authorities or specifying agencies. Otherwise, long-term testing and long-term in-service results (minimum ten (10) years) may be used, with the results extrapolated to fifty (50) years.

P. The CONTRACTOR must have performed long term testing for flexural creep of the CIPP pipe material installed by his company. Such testing results are to be used to determine the long term, time dependent flexural modulus to be utilized in the product design. This performance test of the materials (tube and resin) and general workmanship of the installation and curing. The percentage of the instantaneous flexural modulus value. (as measured by ASTM D-790 testing) will be used in design calculations for external buckling. The percentage, or the long-

term creep retention value utilized, will be verified by this testing. Values more than 50% will not be applied and unless substantiated by qualified third party test data. The materials utilized for the contracted project shall be equality equal two or better than the materials used in the long-term test with respect to the initial flexural modulus used and design.

Q. The minimum required structural CIPP wall thickness shall be based on the physical and structural properties described herein and in accordance with the design equations in the appendix of ASTM F1216, in the following design parameters:

Design Safety Factor	2.0
Retention Factor for Long-Term Flexural Modulus to be used in Design (as determined by Long-Term tests described in paragraph 2.02B)	50%
Ovality*	2%
Groundwater Depth= Pipe Depth (above invert) *	ft.
Soil Depth (above crown) *	ft.
Soil Modulus	700 psi
Soil Density	120 pcf
Live Load	Two H20 passing trucks
Design Condition	Fully deteriorated

**Denotes information which can be provided here or in inspection videotapes or project construction plans. Multiple line segments may require a table of values.*

R. Lining manufacturer shall submit to the OWNER for review complete design calculations for the liner, signed and sealed by a Professional ENGINEER registered in the State of Florida and certified by the manufacturer as to the compliance of his materials and to the values used in the calculations. The buckling analysis shall account for the combination of dead load, live load, hydrostatic pressure, and grout pressure (if any). The liner side support shall be considered as if provided by soil pressure against the liner. The existing pipe shall not be considered as providing any structural support. Modulus of soil reaction shall be 700, corresponding to a moderate degree of compaction of bedding and fine-grained soil as shown in AWWA Manuel M45, Fiberglass Pipe Design.

S. As part of the design calculation submittal, the liner manufacturer shall submit a tabulation of time versus temperature. The tabulation shall show the lengths of time that exposed portions of the liner will endure without self-initiated cure or other deterioration beginning. This tabulation shall be at 5-degree Fahrenheit increasements ranging from 70-degrees Fahrenheit to 100-degrees Fahrenheit. The manufacturer shall also submit his analysis of the progressive effects of such "pre-cure" on the insertion and cured properties of the liner. This information shall be submitted in a timely fashion prior to the pre-construction conference so that the OWNER may set procedures for dealing with such an instance caused by construction delays.

T. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separated cleanly, or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

U. Any layers of the tubes that are not saturated with resin prior to insertion into the existing pipe should not be included in the structural CIPP wall thickness computation.

V. Liner shall be neither accepted nor installed until design calculations are acceptable to the OWNER. Liner shall be as manufactured by Inliner Technologies, Insituform, National Liner, or approved equal.

2.2 REFERENCED INDUSTRY STANDARDS

A. ASTM F-2561, Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main using a One-Piece Main and Lateral Cured-in-Place Liner.

B. ASTM F1216- "Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube", most current version.

C. ASTM F3240- "Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long Term Watertightness of Cured in Place Rehabilitation of Main and Lateral Pipelines", most current version.

D. ASTM F3097- "Standard Practice for Installation of an Outside Sewer Service Cleanout Through a Minimally Invasive Small- Bore Vacuum Excavation", most current edition.

E. ASTM D-790- "Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials", most current edition.

F. ASTM D-792 – "Standard Test Methods for Density and Specific Gravity of Plastics by displacement," most current version.

G. ASTM D-2990 – "Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep Rupture of Plastics", most current version.

H. ASTM D5813 – "Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe", most current version.

I. ASTM F477- "Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe", most current version.

J. ASTM E1252- "Standard practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis", most current version.

2.3 STRUCTURAL REQUIREMENTS FOR CIPP LINER

A. Since the pipe strength is related to the uniformity and density of the pipe wall, only resin vacuum impregnation will be allowed. Resin impregnation without vacuum entraps air and creates voids which weaken the pipe wall. If reinforcing materials (Fiberglass, etc..) are used, the reinforcing material must be fully encapsulated within the resin to assure that their reinforcement is not exposed, either to the inside of the pipe or the interface of the CIPP and the existing pipe.

B. The design for the CIPP wall thickness will be based on the following strengths, unless otherwise submitted to an approved by the OWNER.

Property	**Reference Standard**	**Cured Composite Per ASTM F1216**
Flexural Modulus of Elasticity	ASTM D-790	250,000 psi
Flexural Stress	ASTM D-790	4,500 psi

2.4 TESTING REQUIREMENTS

A. Chemical Resistance - The CIPP shall meet the chemical resistance requirements of ASTM

F1216, Appendix X2. Corrosion resistance of the installed CIPP for municipal applications should be certified to, by the manufacturer, for the type of liquid contained in the pipe being rehabilitated. It is required that CIPP samples with and without plastic coating meet these chemical testing requirements.

B. Hydraulic Capacity - Overall, the hydraulic profile shall be maintained as large as possible. The CIPP shall provide at least 100% of the flow capacity of the original pipe before rehabilitation. In lieu of actual measurements calculated capacities may be derived using commonly accepted equations and values of the Manning flow coefficients (designed "n" coefficients). The original pipe material and condition at the time of reconstruction will determine the Manning coefficient used in the host pipe. A Manning coefficient of 0.009 for a jointless, relatively smooth-wall cured-in-place pipe will be used for the lateral CIPP flow calculation.

C. CIPP Field Samples- When requested by the OWNER, the CONTRACTOR shall submit test results from field installations in the USA of the same resin system and tube materials as proposed for the actual installation. These test results must verify that the CIPP physical properties specified herein have been achieved in previous field applications.

D. Prior to any liner installation the CONTRACTOR shall submit Technical Data Sheets showing the physical and chemical properties and infrared spectrum analysis per ASTM E1252 (chemical fingerprint) of the proposed resin system as modified for the cured-in-place process. Additionally, copies of the certificates of analysis for resin used on the project must be made available to the OWNER. The CONTRACTOR shall test each lot of resin used by conducting infrared spectrum analysis on field samples. The analyses shall be conducted at the CONTRACTOR's expense.

E. The CONTRACTOR shall provide resin samples as directed by the OWNER during the duration of the project and infrared spectrography chemical fingerprints shall be run and compared to the submitted fingerprint to verify the resin used is the resin submitted for use on this project. The analysis shall be conducted at the OWNER's expense.

F. In the case of liner installation performed under this Contract, CIPP samples shall be prepared, and physical properties tested in accordance with ASTM F1216 or ASTM F1743, Section 8, using either method proposed.

1. The CONTRACTOR shall submit a method to the OWNER, for approval, to obtain representative samples from the installed liners. These samples will be tested by the OWNER, at the OWNER's expense, to verify compliance with the installed material specifications. The CONTRACTOR shall produce these test samples when so directed by the OWNER for each line section installed by the CONTRACTOR The OWNER reserves the right to request samples from as many as 10% of the liners installed, unless a pattern of failure occurs. In this case, the CONTRACTOR will be requested to provide a greater quantity of samples, up to 100% at no additional cost, and the CONTRACTOR shall bear all costs of this additional testing. Liners which do not pass these material tests will be rejected and will have to be replaced by the CONTRACTOR at his cost.

2. The cost for sample collection, by the CONTRACTOR, from each line section shall be included in the bid price for rehabilitation.

3. Test specimens shall be marked in indelible ink with the appropriate lateral or main section, work order number, date of installation, and orientation to the top of the pipe (direction of up) so the results can be correlated to the field work performed. All test results shall use this designated labeling as a reference.

4. The extraction and labeling of test specimens shall be done in the presence of the OWNER. The OWNER and the CONTRACTOR shall, upon completion of the sample

extraction and labeling, both sign a chain-of-custody form that shall subsequently always accompany the sample and shall ultimately be received and signed at the testing laboratory. Test reports shall include a copy of the chain-of-custody form with all signatures to ensure that reported test results are for the correct sample.

5. The flexural properties must meet or exceed the values specified herein.

6. Wall thickness of samples shall be determined by high definition as described in paragraph 8.1.6 of ASTM F1743.

7. Visual inspection of the CIPP shall be closed-circuit television, conforming to Section 02752 PIPE INSPECTION (MAINS AND LATERALS)

PART 3 EXECUTION

3.1 CLEANING/SURFACE PREPARATION

A. It shall be the responsibility of the CONTRACTOR to clean the pipeline with a high- pressure water jet to remove all internal debris out of the pipeline in accordance with Section 02751, PREPARTORY CLEANING, ROOT AND TUBERCULATION REMOVAL.

3.2 SEWER REPAIRS

A. Any protruding pieces of concrete, drop joints, or broken pipe shall be subjected to point repairs so that the pipe is left and a clean smooth condition in all respects ready for lining, unless otherwise jointly determined by the CONTRACTOR and the OWNER that the defect will not compromise the integrity of the liner.

B. If conditions such as broken pipe and major blockages are found that will prevent proper cleaning, or where additional damage would result if cleaning were attempted or continued, the CONTRACTOR with the advance concurrence of the OWNER, shall perform the necessary point repair(s), and then complete the cleaning.

3.3 GROUNDWATER CONTROL AND CHEMICAL SEALING

A. Prior to cured-in-place liner installation, all active leaks, as defined by the OWNER of a magnitude to compromise the integrity of the liner shall be stopped using chemical grout, conforming to and paid under Section, 01025 PAYMENTS AND MEASUREMENTS.

B. Materials used on this project shall have the following properties: react quickly to form a permanent watertight seal; resulting seal shall be flexible and immune to the effects of wet/dry cycles; non-biodegradable and immune to the effects of acids, alkalis, inorganics in sewage; component packaging and mixing compatible with field conditions and worker safety; extraneous sealant left inside pipe should be readily removable and shall be compatible with CIPP liner resin system utilized. The chemical sealing materials shall be acrylic resin type and shall be furnished with activators, initiators, inhibitors, and any other materials recommended by the manufacturer for a complete grout system. Sealing grout shall be furnished in liquid form in standard manufacturer's containers. Sealing grout shall be AV-202 manufactured by Avanti International, Houston, Texas 800-877-2570, or approved equal.

C. The CONTRACTOR shall modify his equipment as necessary to seal the leaks, however both his equipment and sealing method must meet the approval of the OWNER prior to use. Extreme caution shall be utilized during leak sealing (pressure) operations to avoid damaging the already weakened sewer pipe. If any damage occurs, it shall be repaired at the CONTRACTOR's cost and to the satisfaction of the OWNER. Excessive pumping of grout which might plug a service lateral shall be avoided. Any service laterals are blocked by the grouting operation shall be cleared immediately by the CONTRACTOR.

3.4 SYSTEM FLOW CONTROL

A. Plugging Main and Lateral Pipes - All system flows from the upstream basin shall be stopped by plugging the main line at the upstream manhole, and by plugging every service line at the clean out, prior to inserting and curing for any CIPP products.

1. Lateral Pipe Plugging- Prior to inserting a resin saturated CIPP liner into a main pipe or a lateral pipe, the service pipe shall be taken out of service by inserting an inflatable plug in the lateral pipe from the upstream side of the cleanout. The plug ensures no sewage flow enters the pipe potentially contaminating the resin saturated liner. The temporary plugging also prevents any sewer gases, steam, or CIPP emissions from migrating into the building through dry fixture traps.

2. For buildings where the service flow cannot be interrupted, the CONTRACTOR shall place an inflatable plug between the first and second cleanout. System flow shall be pumped from the upstream clean out to a designated downstream manhole or to an approved wastewater hauling truck.

3. When sewer line flows at the upstream manhole or any service line being repaired, in the opinion of the OWNER, are too excessive to plug while the rehabilitation is being performed, the CONTRACTOR shall submit a written plan for plugging/pumping/bypassing the flow as acceptable to the OWNER.

4. For multi-story buildings and buildings where the sewer service cannot be interrupted, the CONTRACTOR shall install two (2) clean outs with a minimum separation of eighteen (18) inches conforming to Section 02750 WASTEWATER FLOW CONTROL.

5. Flow control shall be exercised as required to ensure that no flowing sewage meets sections of the sewer under repair. See Section 02750, WASTEWATER FLOW CONTROL for additional information.

3.5 LINER INSTALLATION FOR MAIN LINERS

A. The pre-lining video of the prepared pipe shall be reviewed and acceptable to the OWNER for cleanliness and smoothness before the CONTRACTOR begins the liner installation.

B. CONTRACTOR shall present to the OWNER, for review, a description of his methods for avoiding liner stoppage due to conflict and friction with such points as the manhole entrance and the bend into the pipe entrance. Also, present plans for dealing with liner stopped by snagging within the pipe. This information shall be rendered to the OWNER in a timely fashion prior to the pre-construction conference.

C. CONTRACTOR shall immediately notify the OWNER of any construction delays taking place during the insertion operation. Such delays shall possibly require sampling and testing by an independent laboratory of portions of the cured liner at the OWNER’s discretion. The cost of such tests shall be borne by the CONTRACTOR and no extra compensation will be allowed. Any failure of sample tests or lack of immediate notification of delay should be automatic cause for rejection of that part of the work at the OWNER's discretion.

D. The CONTRACTOR shall designate a location where the tube will be impregnated with resin prior to installation. The CONTRACTOR shall allow the OWNER to inspect the material and the “wet-out” procedure. A copy of a certified wet-out report should be furnished to the OWNER upon delivery of the liner to the project site.

E. The CONTRACTOR shall submit construction schedules for advanced approval by the OWNER. At no time will any service lateral remain non-operative for more than an eight (8) hour period. Any service that will be out of service more than eight (8) hours will be temporarily bypassed

into mainline sanitary sewer at the CONTRACTOR's expense.

F. Before liner installation begins, the CONTRACTOR, shall install hydrophilic end seal gaskets at both the upstream and downstream ends of the existing pipe, sufficiently secured to remain in place during the liner installation. Gasket material shall conform to the requirements of ASTM F3240 Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long Term Watertightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines, latest version.

G. The materials and processes must be reasonably available for pre- installation, and post-installation inspections. Areas which require inspection include, but are not limited to the following:

1. Product materials should exhibit sufficient transparency to visually verify the quality of resin impregnation.
2. Temperature-sensing fiber strip, shall be located between the existing pipe and the CIPP as recommended by the manufacturer to record the cure temperature and the quality of the cure of the wall laminate. The continuous temperature monitoring strip shall be Vericure ™ by Vortex Group, 18150 Valley Drive, Houston, TX 77060, 713-750-9081

3.6 LINER INSTALLATION FOR MAIN LINES

A. Prior to inserting the resin saturated liner, the CONTRACTOR shall install a continuous temperature monitoring fiber strip in the pipe extending over the entire length of the pipe segment being repaired. The fiber strip shall be capable of taking temperature readings every six (6) inches and at thirty (30) second intervals along the entire length of the CIPP segment.

B. The CONTRACTOR shall insert the liner into the pipe at the upstream manhole and cause the liner tube to invert and processed through the main pipe in accordance with ASTM F1216. the liner shall be inflated and inverted using a column of water or compressed air. The rate of inversion shall be controlled ensuring the liner is pressing tightly against the pipe as the liner advances through the pipe until it reaches the downstream manhole. Once the inversion process begins, the liner must remain inflated until the liner has been properly cured and cooled down at no time shall be inflation pressure be dropped.

C. After the inversion is complete, the CONTRACTOR shall supply a suitable heat source including a controlled air/ stream mixture passing through the liner from end to end, or water recirculation equipment to circulate heated water throughout the pipeline, as recommended by the manufacturer. The equipment shall be capable of delivering steam or hot water throughout the pipeline to uniformly raise the water temperature to a level required to effectively cure the resin. The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing steam or water supply. The cure period shall be recommended by the resin manufacturer.

D. Initial cure shall be deemed complete when the exposed portions of the tube appeared to be hard, and sound and the temperature fiber sensor strip indicates that the temperature is of a magnitude to realize an exotherm and proper cool down. The cure period should be a duration recommended by the resin manufacturer and may require continuous circulation of steam or re circulation of the water to maintain the temperature. The CONTRACTOR shall always have on hand, for use by his personnel and the OWNER, a digital thermometer or other means of accurately and quickly checking the temperature of exposed portions of the liner.

E. CIPP Installation shall be in accordance with ASTM F1216, Section 7, or ASTM F1743, Section 6, with modifications as listed herein.

F. Resin Impregnation: 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 impregnation process shall be used. To ensure thorough resin saturation throughout the length of the felt tube, and the point of vacuum shall be no further than 25 feet from the point of initial resin introduction. After vacuum in the tube is established, a vacuum point shall be no further than 75 feet from the leading edge of the resin. The leading edge of the resin slug shall be in near to perpendicular as possible. A roller system shall be used to uniformly distribute the resin throughout the tube. If the installer uses an alternate method of resin impregnation, the method must produce the same results. Any alternate resident impregnation method must be proven to the satisfaction of the OWNER.

G. Tube Insertion: The wet-out tube shall be positioned in the pipeline using either inversion or pull-in method. If pulled into place, a power winch should be utilized, and care should be exercised not to damage the tube because of pull- in friction. The tube should be pulled-in or inverted through an existing manhole or approved access point and fully extend to the next designated manhole or termination point.

H. A continuous temperature monitoring strip shall be placed inside the tube extending from manhole to manhole to monitor the temperatures during the cure and cool down cycle.

I. Curing shall be accomplished by utilizing controlled steam or hot water under hydrostatic pressure in accordance with the manufacturer's recommended cure schedule.

J. Cooldown: The CONTRACTOR shall cool the hardened pipe to a temperature below 100 degrees Fahrenheit before relieving the inflation pressure. Cooldown may be accomplished by the introduction of ambient air or cool water into the CIPP segment. Care should be taken in release of static head so that vacuum will not be developed that could damage the newly installed liner.

K. Finish: The new pipe shall be cut off in the manhole at a suitable location. The finished product shall be continuous over the length of pipe reconstructed and be free from dry spots, delamination, and lifts. Pipe entries and exits shall be smooth, free of irregularities, and watertight. No visible leaks shall be present, and the CONTRACTOR shall be responsible for grouting to remove leaks or fill voids in the host pipe prior to inserting and curing the CIPP liner. 100% of all lateral reconnections and manhole drop connections shall be chemically grouted after CIPP has been installed. During the warranty period, any defects which will affect the integrity or strength of the product shall be repaired at the CONTRACTOR's expense, and in a manner mutually agreed upon by the OWNER and the CONTRACTOR.

3.7 REINSTATEMENT OF SERVICE LATERALS, BRANCH CONNECTIONS, AND DROP MANHOLE CONNECTIONS

A. After the pipe has been cured in place, the CONTRACTOR shall reconnect the existing service connections. This shall be done from the interior of the pipeline without excavation using a robotic cutter. Where holes are cut through the liner, they shall be neat and smooth to prevent blockage at the service connections. Cut-in service connections shall be opened to a minimum of 95% of the flow capacity of the building sewer. Cuts shall be wire-brushed to remove jagged edges. All coupons shall be recovered at the downstream manhole and removed. The CONTRACTOR shall stop all visible leaks, including at the service connections. All reinstated service lateral connections (between the liner and the existing pipe) shall be grounded. Grouting of service laterals is considered incidental to the lateral reinstatement and shall not be a separate pay item.

B. The CONTRACTOR shall seal all laterals after the reinstatements are 100% cut and brushed. The sealing is to follow ASTM F2454. The lateral sealing area is to include the first joint or 18" into the lateral pipe whichever is more. A standard grout/test packer shall be used to seal the

connection, the annular space and the first pipe joint is sealed. If the test fails any resealing will be done at the expense of the CONTRACTOR. All grout sealing required (lateral connections and drop manhole connections) are to be 100% completely sealed before the final video is done to document that the completed section is ready to be submitted for payment. The final video must show the entire surface of the lateral (pan the lateral) and the up and downstream manhole connections. During the sealing and testing of the lateral connections the CONTRACTOR is to have an inspector present to document the procedure. The CONTRACTOR is also directed to videotape the seal and completed testing as follows. To be paid for the lateral reinstatement the video must show 1) a 5 second video prior to sealing, 2) 15 second video of the test pressure showing the lateral past the pressure test. The screen must have the lift station number, manholes and manhole numbers in the station footage of the lateral on the main. The video must not run the entire time, just as described above.

C. It is the intent of these Specifications that the service laterals be reopened without excavation, utilizing a remote-controlled cutting device, monitored by a video TV camera. The CONTRACTOR shall certify he has a minimum of two (2) complete working cutters plus spare key components on the site before each liner installation. No additional payment will be made for excavations for the purpose of re-opening connections due to cutter device failure and the CONTRACTOR will be responsible for all costs and liability associated with such excavation and restoration work.

D. Unless otherwise directed by the OWNER, all laterals will be reinstated. The OWNER will provide specific direction concerning any laterals that will be abandoned and will therefore not require reinstatement. The CONTRACTOR shall abandon a lateral by not reinstating the lateral only with consent of the OWNER. A record of all laterals not reinstated shall be provided to the inspector at the end of each day.

E. The language in this section applies equally to branch connections and drop manhole connections.

3.8 ACCEPTANCE

A. The finished liner shall be continuous over the entire length of the installation. The liner shall be free from visual defects, damage, deflection, holes, delamination, uncured resin, and the like. No pin holes, cracks, thin spots, dry spots, or other defects in the liner will be permitted. There shall be no visible infiltration through the liner or from behind the liner at manholes and service connections. Cut-ins and attachments at service connections shall be neat and smooth.

B. Ridges or wrinkles in the install liner shall be accepted or rejected at the sole discretion of the OWNER. If, in the opinion of the OWNER, such defects could cause structural weakening of the liner, impede the progress of camera during internal television inspection, or encourage solids deposition and potential interruptions to flow, such defects should be corrected at the CONTRACTOR's expense in a manner acceptable to the OWNER.

C. If a "lift" or other defects in a CIPP liner (Main or Lateral) occurs, the CONTRACTOR shall robotically remove the defective section and install a CIPP Sectional Liner that complies with ASTM F2599. if the length of the defective section is greater than 5% of the overall length of the CIPP extending between two (2) manholes, the CONTRACTOR shall robotically remove the defective section and install an entirely new liner extending from manhole to manhole conforming to ASTM F1216 or F1743, at no additional cost to the OWNER. When the CONTRACTOR is required to use a sectional liner to repair a defective section, or to reline the entire pipe length, the pay item for the entire CIPP liner length (Main or Lateral) shall be reduced by 20% at the CONTRACTOR's bid price. The CONTRACTOR will also be required to reinspect the repaired CIPP at one (1) year from the date of acceptance, at no additional cost to the OWNER.

3.9 WET-OUT AND CURE REPORT

A. The CONTRACTOR shall submit "wet-out" and "cure" reports documenting the specific details of the liners vacuum impregnation in saturation with resin and the CIPP installation of the liner. A copy of all "wet-out" and "cure" records shall be made available to the OWNER upon request and shall be turned over to the OWNER on a weekly basis and prior to requests for payment. If the "wet-out" and "cure" reports are not presented prior to a payment request for a repair work order, payment for the work will not be made and their request will be rejected. At a minimum, this report shall include, in addition to the CONTRACTOR, location and contract identification:

1. Wet Out Report

   a. Line identification and location.
   b. Wet-out date
   c. Sample identification(s) and technician certification
   d. Liner thickness
   e. Liner length
   f. Wet out length
   g. Resin Manufacturer and type
   h. Quantity of resin and catalyst utilized
   i. NIP (Calibration Roller spacing in (mm)
   j. Responsible wet-out technician
   k. Time of start and completion of wet-out

2. Cure Report

   a. Installation (in sewer) date
   b. Host sewer pipe inside diameter and length
   c. Manhole to manhole identification
   d. Pressure and temperature time log, at regular intervals, from warm up to cool down including heater pressure, liner pressure, liner temperature, and continuous temperature monitoring fiber cable temperature report.
   e. Cool down report

3.10 CLEANUP

A. After the liner installation has been completed and accepted, the CONTRACTOR shall cleanup the entire project area and return the ground cover to the original or better condition. All excess material and debris not incorporated into the permanent installation shall be disposed of by the CONTRACTOR.

3.11 TELEVISION SURVEY

A. Television survey, including Pre-Construction Survey, Post-Construction Survey, as indicated in Section 02752 PIPE INSPECTION (MAINS AND LATERALS), is required for all cured-in-place lining, including main lines in service laterals, and shall be completed and submitted for Owner's review within two (2) weeks of liner installation.

3.12 PUBLIC NOTIFICATION

A. The CONTRACTOR shall make every effort to maintain service usage throughout the duration of the project. If a service lateral will be out of service, the maximum amount of time of no service shall be eight (8) hours for any property served by the sewer. A public notification program shall be implemented, and shall as a minimum, require the CONTRACTOR to be responsible for contacting each home or business connected to the sanitary sewer and informing them of the work to be conducted, and when the sewer will be off- line. The CONTRACTOR shall also provide the following:

1. Whether or not an interruption in service is expected, written notice to be delivered to each home or business the day prior to the beginning of work being constructed on the section, and a local telephone number of the CONTRACTOR the home or business can call to discuss the project or any problems which could arise.

2. Personal contact with any home or business which cannot be reconnected within the time stated in the written notice.

3.13 WARRANTY

A. The liner shall be certified by the manufacturer for specified material properties for a particular job. The manufacturer warrants the liner to be free from defects in raw materials for five (5) years from the date of acceptance. During the warranty period any defects which affected the integrity or strength after pipe shall be repaired at the CONTRACTOR's expense in a manner mutually agreed by the OWNER and the CONTRACTOR.

B. The CONTRACTOR warrants his work to be sealed tight from extraneous flow at each end of the liner, drop connections, and at each service connection for a period of five (5) years.

END OF SECTION

SECTION 02766

UV LIGHT GLASS REINFORCED CURED-IN-PLACE PIPE - MAIN

PART 1 - GENERAL

1.1 SCOPE

A. Methods and materials for the rehabilitation of partially and fully deteriorated mainline pipelines by the Light Cured-In-Place Pipe (CIPP) process.

B. UV Light Glass Reinforced Cured-in-Place Pipe, Mains shall conform to Section, 01010, Part 3.

1.2 REFERENCES

The Reference Standards shown below shall be the most recent version available at the stated time of the bid opening.

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

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

C. ASTM F2019 Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Pulled in Place Installation of Glass Reinforced Plastic (GRP-CIPP) Using the UV-Light Curing Method ASTM D-2990 Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics.

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

E. ASTM D3567 Standard Practice for Determining Dimensions of Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings.

F. ASTM D5813 Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe.

International Standard References

G. ASTM F3240- "Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Watertightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines.

H. DWA M143-20 Water Tightness Standard.

I. Hamburg Model – High Density Flushing Test.

J. DIN EN 295-3/DIN 19565 Abrasion Test – Darmstadt Pipe Tilting Jig Method.

K. ISO 11296-4 Plastics Piping Systems for Renovation of Underground Non-Pressure Drainage and Sewerage Networks – Part 4: Lining with Cured in Place Pipes.

L. ISO 178 Plastics – determination of flexural properties

1.3 SUBMITTALS

A. Submit CONTRACTOR and Liner Manufacturer Qualifications.

B. Submit Liner Manufacturer's documentation, affidavits, and approvals as follows:

1. Liner Manufacturer's current ISO 9001 Certification.

2. Liner Manufacturer's recommended storage and handling, installation, curing, and sampling procedures.

3. Letter of Certification by the liner manufacturer stating the CIPP CONTRACTOR's and Superintendents licensure to install the provided CIPP.

4. Letter of certification by the liner manufacturer that the CIPP liner is manufactured per Section 5 of ASTM F2019-20 and the resin is suitable for the installed environment and for light curing.

5. Letter of Certification that the curing equipment to be used is compatible with the proposed lining product(s).

6. Submit Curing Protocols, Charts, Procedures and Curing Equipment Wheel and/or leg configurations as recommended by the liner manufacturer for each liner dimension.

7. Submit Certification that the CONTRACTOR has been properly trained in the use of the equipment.

C. Submit CIPP material data and testing as follows:

1. Affidavit for third party testing laboratory.

2. Certified test reports for long-term and short-term material properties and chemical resistance. A letter of surety, signed by an officer of the manufacturer, shall be provided with all testing results stating that the materials were tested and submitted, and the materials provided for this project are the same or comparable.

3. Certified Hamburg Model testing results.

4. Certified Test Results for abrasion resistance in accordance with DIN EN 295-3 / DIN 19565.

5. Sampling plans and certified test results of installation/field samples.

6. Proposed sampling locations.

D. Submit representative CIPP design thickness calculations provided by the CONTRACTOR as determined by the OWNER.

E. Submit project specific CIPP Installation Plan

F. Submit project CCTV Inspection records, curing protocols, and reports. Inspections and reports shall be provided for each installation including:

1. Pre-inspection

2. Installation Curing Protocol
3. Post-installation

G. Submit Liner Manufacturer Defect Warranty information.

H. Submit materials and methods for sealing termination points at manhole connections as follows:

1. Sealing Product shall comply with ASTM F3240 most current version.

I. CONTRACTOR shall submit a repair plan to OWNER or OWNER'S REPRESENTATIVE should corrections to the Work be required.

1.4 QUALIFICATIONS

A. Liner Manufacturer: Company specializing in manufacturing the Products specified in this section shall be commercially proven and shall have current ISO-9001 certification. Liner Manufacturer shall supply references supporting the ISO certification.

B. Installer: CONTRACTOR specializing in performing the work of this section and who is licensed and approved by the manufacturer. CONTRACTOR shall be certified by both the light cure liner Manufacturer and Equipment Manufacturer. CONTRACTOR shall have experience with projects of similar size and complexity as this project, minimum of 150,000 feet of installed light cure CIPP product within the last 5 years of similar diameter or project scope. CONTRACTOR shall supply references supporting the experience requirements.

Unless otherwise allowed prior to bid acceptance, Liner Manufacturer experience shall not be utilized in lieu of actual installer experience. Installer experience refers to the actual CONTRACTOR intending to do the work. For new installers with first projects the liner manufacturer's own experienced trainers may be considered by the OWNER as sufficient site support during those installations.

C. Project Superintendent: Project Superintendent shall have a minimum of 3 years' experience as a Superintendent on light-cured CIPP projects, and have supervised the installation of ≥10,000 feet of installed light-cured CIPP product within the last 3 years, or otherwise allowed prior to bid acceptance. CONTRACTOR shall supply references supporting the Superintendent experience requirements.

Full Time Project Superintendent to be on site at all times throughout the duration of the lining work.

PART 2 PRODUCTS

2.1 LINER MANUFACTURER QUALITY CONTROL

A. The Manufacturer shall have a Quality Control Plan and Reporting Procedure in place that will allow the OWNER or OWNER'S REPRESENTATIVE to review the manufacture of the liner and resin impregnation process.

B. The liner shall be fully saturated with resin in the Manufacturer's plant under quality-controlled conditions in accordance with ASTM F2019, Paragraph 6.3.1.

C. Fabrication of the liner and resin saturation (wet-out) may be inspected at the Liner Manufacturer's facility for compliance with these specifications by OWNER or OWNER'S REPRESENTATIVE. The CONTRACTOR shall require the facility's cooperation in these inspections.

D. No change of material, design values, or procedures for provided CIPP may be made during the Work without the prior written approval of the OWNER or OWNER'S REPRESENTATIVE.

E. At the time of manufacture at the Liner Manufacturer's facility, inspect each production lot of liner for defects. At the time of delivery, the liner shall be homogeneous throughout, uniform in color, free of cracks, holes, foreign materials, blisters, resin blow-out or deleterious faults. For the purposes of inspection, warranty, and testing, a production lot shall be kept on record consisting of resin and other raw material samples as needed.

2.2 CIPP TESTING AND SAMPLING

A. Testing shall be performed by an independent, third-party laboratory as recommended by the liner manufacturer and approved by the OWNER or OWNER'S REPRESENTATIVE. The testing laboratory shall be ISO 17025 certified and have American Association for Laboratory Accreditation (A2LA) for the specified test to be performed. The testing laboratory shall conform to the Liner Manufacturer's recommended testing protocols. The CONTRACTOR shall provide a certified affidavit, signed by an officer of the testing laboratory. ASTM F2019 reference: Section 7, X2, X3, modified test procedure to ASTM D790 and ASTM D2990.

B. Prior to construction, the CONTRACTOR shall submit certified test reports for the exact resin/liner combination to be provided on the project. If the liner used for testing is not the exact liner to be provided on the project, submit a detailed description of the physical properties of both the liner used in the test and the liner to be provided for this project to demonstrate the two liners are comparable for acceptance by the OWNER or OWNER'S REPRESENTATIVE.

i. Prior to construction, the CONTRACTOR shall submit certified test reports of chemical resistance testing performed in accordance with Section 5.2.7 of ASTM F2019, which requires that that the liner be evaluated in a laminate form for qualification testing of long-term chemical exposure to a variety of chemical effluents in a manner consistent with 6.4.1 and 6.4.2 of the Specification ASTM D5813.

ii. Prior to construction, the CONTRACTOR shall submit certified type test reports of long-term and short-term flexural modulus of elasticity, flexural strength (bending stress). Tested samples shall meet the liner manufacturer's declared values or exceed the minimum values of Table 1 shown in ASTM F2019.

1. Type testing for the Long-term flexural modulus of elasticity and strength (i.e., 10,000-hour creep) shall be performed in accordance with ASTM D2990 as described in ASTM F2019, X.3. Load shall be applicable to the design conditions or equivalent to 0.25% of the initial flexural modulus of elasticity as determined by ASTM D790, minimum, in accordance with ASTM F2019. Or as per DIN EN 761 / DIN 53769-3

2. Short-term flexural modulus and strength of the proposed liner product shall be determined in accordance with ASTM D790, Test Method 1 – Procedure A on flat plate, lab prepared beam specimen in the circumferential (hoop) direction of the laminate's structure. The specimen shall be a minimum of 2.0" in width. A length to depth ratio of 16:1 shall be employed.

iii. During installation and curing, the CONTRACTOR shall take samples in accordance with ASTM F2019 and the Liner Manufacturer's recommendations. Samples shall be restrained, taken from wherever practical of the installed liner, unless previously approved in writing by the OWNER or OWNER'S REPRESENTATIVE. Samples shall be taken and tested for every 1000' of each

diameter liner installed. Certified test reports shall be submitted as described below.

1. The CONTRACTOR shall provide a restrained sample piece sufficient in length to produce a minimum of five usable test specimen for short-term flexural modulus and strength testing of the installed liner. As described in Section 7 of F2019, the specimen will need to be 2.0" in width; taken in the circumferential (hoop) direction. The initial tangent modulus of elasticity and flexural strength from the field prepared sample shall be measured in accordance with Test Method D790, Test Method 1 – Procedure A as modified by Appendix X2 in F2019. In accordance with ASTM F2019, these curved beam specimens achieving average value that is 85% or higher of the flexural properties used for wall thickness design calculations shall be considered passing.

2. The minimum wall thickness shall be determined at 8 locations on a cut section of the CIPP sample. Thickness shall be measured per ASTM D3567 Section 7. The average thickness shall be calculated using all measured values and shall meet or exceed the minimum design thickness in accordance with the design criteria. The minimum wall thickness at any point shall not be less than 80% of the specified design thickness as required by ASTM F2019.

3. Samples shall be taken in the presence of the OWNER or OWNER'S REPRESENTATIVE and in accordance with ASTM F2019. Samples shall be identified by: date, time, project, and location (street location, pipe reach).

iv. During installation and curing, the CONTRACTOR shall take field samples to test for water tightness in accordance with the DWA M143-20/Water Tightness guideline at a negative pressure of 0.5 bar or 7.25 PSI for 30 minutes.

1. A sample shall be taken for each production lot, type, thickness or nominal diameter of liner installed. Additional samples shall be taken for each 2000 LF of installed liner.

2. Samples shall be prepared in accordance with applicable requirements, taken in the presence of the Construction Manager or Inspector, tested by a certified third-party laboratory and certified test reports shall be submitted for liner acceptance.

3. Samples shall be taken at locations based on the CONTRACTOR's field review of existing conditions and the ability to obtain a sample from the installed, cured liner. The CONTRACTOR shall submit a list of proposed sampling locations for review and acceptance by the OWNER or OWNER'S REPRESENTATIVE.

v. The CONTRACTOR may, at their discretion, conduct additional testing to demonstrate compliance with the specified requirements. No tests shall be performed on an installed and cured liner within the host pipe without prior written approval from the OWNER or OWNER'S REPRESENTATIVE.

vi. The OWNER or OWNER'S REPRESENTATIVE reserves the right to require additional field-testing to demonstrate the provided CIPP meets the minimum material properties specified and the design requirements for the sampled thickness and material properties.

vii. Final payment will not be made until test results are received. The CONTRACTOR shall be responsible for any deviation from the specified physical properties and those evaluated through testing. Failure to meet the specified physical properties will result in the CIPP liner being considered defective work.

2.3 MATERIALS

A. Tube

1. The fiberglass tube material shall meet the requirements of ASTM F2019. Standard felt or felt composite lining material and systems are not acceptable.

2. The tubes shall have a uniform thickness that when compressed at installation pressures will equal the designed nominal tube thickness.

3. CONTRACTOR shall submit tube thickness design calculations based on structural requirements listed below.

4. The tube shall be fabricated to a size that when installed, will tightly fit the internal circumference and length of the original pipe. Allowance should be made for circumferential stretching during insertion. The minimum length shall be that deemed necessary by the CONTRACTOR to effectively span the distance between respective access points unless otherwise specified. The CONTRACTOR shall verify the lengths and diameters in the field before fabricating the tube. Individual insertion runs can be made over one or more manhole sections as determined in the field by the CONTRACTOR, as long as traffic control restrictions are adhered to.

5. The outside layer of the tube (before insertion) shall be plastic coated with a flexible material.

6. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers.

7. The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detail examination with closed circuit television inspection equipment may be made.

8. Over Expansion Sleeves, if required by the manufacturer, shall be used in the following locations and as directed by the ENGINEER after the pipeline has cleaned and inspected via CCTV per the contract documents:
    a. Each end of the pipe segment and intermediate manholes, if required by the Liner Manufacturer

    b. At each section of pipe that has complete or significant wall loss.

viii. LIGHT CURE MATERIALS

1. For Light-Cure products, the fiberglass shall be Environmentally Corrosive Resistant (ECR) fiberglass and the finished ultra-violet light cured fiberglass pipe liner shall be fabricated from materials which when complete are chemically resistant to and will withstand internal

exposure to domestic sewage and temperatures up to 150 F.

2. All ultra-violet light cured-in-place fiberglass lining products shall comply with ASTM F2019 or the intent thereof as determined by the ENGINEER, minimum finished liner thickness as defined by design calculation.

3. The MANUFACTURER shall furnish a general-purpose polyester or vinyl ester ultra-violet light curing resin and catalyst system compatible with the ultra-violet light curing process that provides cured physical strengths specified herein.

4. The liner shall be provided with interior and exterior films to prevent resin migration and contamination. Films shall be in accordance with ASTM F2019 and shall be a styrene gas barrier. Inner films shall be fully removed during the installation process unless it is a permanent part of the system and fabricated as an integral part of the fabric tube by bonding or fusing. Exterior films shall block ultra-violet light.

5. The interior and exterior films shall be free from tears, holes, cuts, foreign materials and other surface defects.

6. The layers of the cured CIPP shall he uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly, or the probe or knife blade moves freely between the layers; nor shall separation of the layers occur during testing performed under the requirements of this specification.

ix. END SEALS at TERMINATION POINTS or MANHOLES

7. The annular space at all locations where the CIPP enters and exits a manhole or other access structure shall be made leak-tight by the installation of a seamless pre-formed hydrophilic elongated sleeve designed for CIPP sanitary sewer pipe rehabilitation. The gasket sleeve shall surround the circumference of the CIPP for a minimum width of 3 inches necessary to accommodate any irregularities in the host pipe wall surface. The gasket sleeve and installation shall conform to ASTM F3240.

2.4 STRUCTURAL REQUIREMENTS and DESIGN CRITERIA

x. The cured CIPP for fiberglass reinforced tubes shall also conform to the minimum structural standards as listed below:

CIPP Initial Structural Values per ASTM F2019 – Table 1

Flexural Strength (ASTM D790)	Declared Value, but not less than 15,000 PSI
Flexural Modulus (ASTM D790)	Declared Value, but not less than 725,000 PSI

xi. The liner thickness for each liner installed shall be determined per the site-specific conditions as shown on the drawings or given elsewhere in these contract documents for that specific reach of buried piping. Design calculations shall be made by a professional ENGINEER skilled in the design of these systems in accordance with the guidance given in the Design Appendix X1 of ASTM F2019. The preferred design analysis for circular and non-circular pipe shapes shall be a Modified-Glock buckling analysis. Alternatively. circular pipe shapes with deflections up to 10% may be designed using the design equations contained in the F1216 Design Appendix X! excepting that equations X1.2 and X1.4 will not be used. Further, the maximum DR value of 100 shall not be used.

xii. The liner shall be structurally designed to the following standards:

1. Minimum Design Service Life: 50 Years or as otherwise required on the plans.

2. Partially deteriorated host pipe condition as per the definition given in the Design Appendix X1 of ASTM F1216 unless otherwise given on the plans or the condition of the pipe found by the professional ENGINEER during his/her viewing of the pre-lining CCTV survey warrants making the design as a Fully deteriorated condition.

3. Soil loading: When the design condition warrants a fully deteriorated design the ENGINEER shall use a value of 120 PCF for the soil. For pipes with less than 10.0 feet of cover, the full prism load shall be employed. For pipes with 10.0 feet of cover and greater, the soil load shall be equal to 2.0 times the vertical diameter of the host pipe.

4. Factor of safety: 2.0

5. Existing Ovality: The existing ovality of a flexible host pipe or a fractured rigid host pipe shall be taken as 2% unless found to be greater during the review of the CCTV survey. Rigid pipes with no fractures shall be taken as having a max ovality of 0.35%.

6. Maximum deflection: 5%

7. Soil modulus: The constrained soil modulus shall be as per the values given in Table 5-4 of the AWWA Manual M45

8. Maximum lining enhancement factor: 7

9. H-20 or another applicable surface live loading, when applicable

10. Liner Manufacturer's applicable long-term modulus reduction/retention factor, as supported by documentation.

11. Groundwater: the ENGINEER making the wall thickness calculations shall use the actual groundwater level as shown on the plans, or as determined by local piezometric wells maintained by various governmental agencies. If there is no groundwater present at the elevation of the host pipe in the ground, a virtual groundwater load equal to a minimum of 60 inches above the pipe invert or at least 4-inches above the crown of the liner, whichever is greater, shall be used. However, in no case shall this height exceed the cover depth of the host pipe. Both equations X1.1 and X1.3 of the F1216 solution shall take H_w as being the height of the groundwater above the invert

PART 3 – EXECUTION

3.1 PREPARATION

A. Access Points - CONTRACTOR will locate and designate all manhole access points, open and make access points available for the Work.

B. Cleaning of Sewer Lines - The CONTRACTOR shall remove all roots and internal debris (including grease), from the sewer line prior to CIPP installation by any means necessary.

C. Inspection of Pipelines - Inspection of pipelines shall be performed by NASSCO PACP-certified personnel, experienced and trained in locating defects, breaks, obstacles and service connections

by closed circuit television (CCTV).

D. Infiltration - Minor infiltration is a normal condition sometimes encountered during the CIPP process. It is not a "changed condition" and should not be regarded as a reason for change orders. If in the opinion of the ENGINEER, infiltration is significant enough to adversely affect the curing process, chemical grouting or other remedies may be required. This additional work will be considered incidental to the Work and to be included in the price for installation of the glass fiber reinforced liner (CIPP).

E. Site Restoration - Areas damaged or modified by the Work for this project shall be repaired or restored to a condition equal or better than the original condition. Site restoration shall be considered incidental to the Work and shall not be a reason for change orders.

F. Public Relations - A Public Information and Notification Program shall, as a minimum, require the CONTRACTOR to be responsible for contacting homeowners or businesses who will be affected by the construction activities and informing them of the Work to be done and the estimated timing for the Work. Written notice shall be delivered to each home or business 2 weeks prior to installation. Notice shall include a local telephone number of the CONTRACTOR they can call to discuss the project, and how the homeowner or business will be affected. The written notice must be reviewed by the CONTRACTOR prior to the start of' any work.

G. Service connections - Determine by dye test, running water or visual inspection whether connections are active or abandoned and provide results to ENGINEER prior to insertion. ENGINEER and CONTRACTOR shall agree prior to insertion which services are to be reopened. Only reopened services will be paid for.

3.2 CONTRACTOR'S INSTALLATION PLAN

A. The CONTRACTOR shall prepare and submit a detailed Installation Plan for completion of the Work. The Manufacturer shall review and approve the plan and any deviations from their recommended procedures.

B. The CONTRACTOR shall review available CCTV data for the pipelines to be rehabilitated as part of preparing the Installation Plan. The CONTRACTOR shall perform additional CCTV inspection as necessary to prepare the Installation Plan.

C. For each installation, the plan shall provide the following minimum information:

1. Manufacturer's storage and handling recommendations with site-specific requirements for the project.

2. Access, termination, and intermediate manholes; direction of pull; maximum pulling force; and location of equipment (i.e. Restraint sleeves, winch, rollers, etc.). The CONTRACTOR shall physically inspect each manhole for suitability and use during installation, curing, and sampling.

3. Confirm diameter, alignment, depth, and condition of each pipe to be lined.

4. Identify point repairs, infiltration/exfiltration repairs, pre-liners, or slip sheet liners to be completed or provided prior to installation of the liner.

5. Installation, curing, and sampling procedures including the Liner Manufacturer's

recommendations. Curing requirements shall be provided as part of the Curing Control Protocol.

6. Location of service connections and reference points for reinstatement including distance between reference points and service connections, clock position, and diameter.

7. Methods and materials to provide seal at manholes.

8. Pre-inspection CCTV data.

9. Curing Control Protocol.

10. Liner and/or UV Curing Equipment Manufacturer's leg and wheel configurations for the sizes of liner to be installed during the Work.

3.3 INSTALLATION

A. CIPP installation shall be in accordance with ASTM F2019 for UV Curing Installations. Installation shall be in accordance with the Liner Manufacturer's recommendations, which shall be available for verification by the ENGINEER.

B. Curing schedules shall be strictly adhered to, per the Liner Manufacturer's requirements.

The CONTRACTOR shall provide a curing control protocol in accordance with Section 6.7.3 of ASTM F2019 for each installation. The protocol shall include actual materials and equipment (e.g. light train) to be utilized by the CONTRACTOR. The Liner Manufacturer shall approve the control protocol in writing.
Curing protocols (and CCTV inspection records, if required) shall be automatically collected during the installation and curing process. Copies shall be submitted to the OWNER or OWNER'S REPRESENTATIVE for review. Where the curing data and the curing protocol differ, the OWNER or OWNER'S REPRESENTATIVE reserves the right to require additional Quality Assurance information from the Liner Manufacturer and may require "in pipe" sampling and testing be completed by the CONTRACTOR at no additional cost to the OWNER.
The protocol and recording shall include the following minimum information:

1. Curing speed
2. Light sources working and wattage
3. Inner air pressure
4. Exothermic (curing) temperature
5. Date and time
6. Length of liner
7. Location of installation

C. Installation, curing, and sampling shall be in accordance with the Liner Manufacturer's recommendations, ASTM F2019, and as specified herein. In case of conflict between these requirements, those affording the greatest protection to the OWNER shall apply, as determined by the OWNER or OWNER'S REPRESENTATIVE.

D. Prior to installation of the liner, CONTRACTOR shall clean and inspect the pipe reach being rehabilitated. Perform inspections in the presence of the OWNER or OWNER'S REPRESENTATIVE prior to liner installation to demonstrate that the pipe is clean and free of conditions that will affect the installation. The inspection shall demonstrate that service connections are accurately located according to the Installation plan and the distances shown can be replicated by crews and equipment performing service connection re-

establishment.

E. If conditions that negatively impact installation are identified, including but not limited to poorly located laterals, debris, displaced pipe, protruding taps, infiltration gushers or infiltration runners that cannot be balanced by installation pressure, they shall be corrected in accordance with the Contract Documents and to the satisfaction of the OWNER or OWNER'S REPRESENTATIVE. Installation shall not proceed until the requirements of this paragraph are met.

F. Bypass of sewer mainline flows shall be performed during inspection, installation, service connection re-establishment (as required), and during post-installation CCTV inspection.

G. Insert slip-sheets, pre-liners, and liner sleeves in accordance with the approved Installation Plan and/or Liner Manufacturer's recommendations.

H. A constant tension winch shall be used to pull the liner into place to extend fully between the access manhole and next designated manhole or termination point. The pulling speed and tension shall not exceed Manufacturer's recommendations. CONTRACTOR shall exercise care not to damage the liner during the pulling phase.

I. The liner shall be pressurized incrementally to the minimum recommended inner pressure. The pressure head shall be sufficient to hold the liner tight to the pipe wall and shall be maintained to allow water pockets to be displaced through the host pipe and prevent lifts in the liner.

J. Proper placement of the liner shall be verified utilizing the CCTV camera on the Light Train. The CONTRACTOR shall remove or repair any anomaly observed prior to curing.

K. The liner shall be cured at a constant inner pressure. Workers shall not be present in the manhole during pressurization of the liner. Packers and clamping straps shall be properly installed and attached. If a constant inner pressure cannot be maintained, replace or repair the inner foil in accordance with the manufacturer's recommendations.

L. The light train shall be assembled according to the Manufacturer's recommendations for the sewer pipe and liner diameter. Cure the liner in accordance with the curing protocol and submit record to the OWNER or OWNER'S REPRESENTATIVE.

M. CONTRACTOR shall obtain samples during installation in accordance with ASTM F2019. Samples shall be taken in the presence of the OWNER or OWNER'S REPRESENTATIVE.

N. Remove the inner film, where required per ASTM F2019, section 5.2.3.

3.4 REINSTATEMENT OF SERVICE CONNECTIONS

A. After the liner has cured, CONTRACTOR shall reinstate active service connections. Capped service connections shall not be reopened.

B. Always maintain two working lateral reinstatement cutters at the job site. Lining work shall not commence if the CONTRACTOR does not have the required number of working cutters on site. No additional time or compensation shall be awarded to the CONTRACTOR if work is stopped due to the CONTRACTOR'S failure to comply with this requirement.

C. Services shall be reinstated and brushed to a minimum of 95% of the original opening as it enters the main or conduit. Finished service connection openings shall be free of burs, excess films, or deleterious materials, which may hang up paper or solids entering the main or

conduit as referenced in ASTM F2019, section 6.8.

3.5 DELIVERY, STORAGE, and HANDLING

xiii. Materials shall be shipped, stored, and handled in accordance with the Liner Manufacturer's recommendations. Storage of materials shall consider local environmental conditions and the CONTRACTOR shall implement and document site-specific procedures as required.

xiv. If any part of the liner becomes damaged before or during installation, the liner shall be repaired or replaced in accordance with the Liner Manufacturer's recommendations. Liners damaged in such a manner that hinder or prevent proper installation or curing or release detrimental compounds shall be rejected.

xv. The OWNER or OWNER'S REPRESENTATIVE reserves the right to reject liners without Certification Documentation or liners that exceed the Manufacturer's shelf life. Liner materials, which have exceeded the Liner Manufacturer's stated shelf life, must be re-certified and tested in accordance with the Liner Manufacturer's QC/QA procedures.

xvi. Rejected materials shall be removed from the project site; disposed of in accordance with local, state, or federal regulations; and replaced at no additional cost to the OWNER.

3.6 APPROVED PRODUCTS AND INSTALLERS (OR APPROVED EQUAL):

END OF SECTION

SECTION 02770
CURED-IN-PLACE PIPE LINING- LATERAL

PART 1 GENERAL

1. INTENT

This specification covers material requirements, installation practices, and test methods for the reconstruction of a sewer service lateral pipe in the main connection without excavation. The pipe rehabilitation shall be accomplished by the installation and curing of a resin impregnated single-piece Main/Lateral connection liner. The cured-in-place pipe (CIPP) shall extend over a predetermined length of the lateral pipe and the full circumference of the main pipe connection. The materials and installation practices shall, comply with the latest version of ASTM 2561- "Standard Practice for Rehabilitation of Sewer Service Lateral and its Connection to the Main using a One-Piece Main and Lateral Cured-in Place Liner." The CIPP shall be outfitted with a pre- molded Neoprene® connection gasket and end seal gaskets in accordance with the latest version of ASTM F3240.

1.1 GENERAL

The reconstruction shall be accomplished using a resin absorbent textile tube of a particular length and a thermal- set resin with physical and chemical properties appropriate for the application and flow characteristics in the main/ lateral pipe. The launching device is pulled through the main pipe and positioned at the service connection. The mainline bladder is inflated seating the connection gasket into the lateral pipe and pressing the connection liner against the main pipe. Continued infiltration causes the lateral tube to progress up the lateral pipe by the action of an inverting bladder. The resin-saturated liner is cured, the CIPP rehabilitated lateral pipe and its connection to the main is sealed using a neoprene hydrophilic connection gasket, and the launching device is removed from the pipe.

A. The CONTRACTOR shall submit confirmation to the OWNER that all system flows have been removed from the lateral pipe prior to the insertion of a liner system (CIPP) by plugging the pipe, and whenever necessary maintain lateral service by pumping the flow to an approved designated point of discharge.

B. A carbon charcoal filter capable of removing VOC's and unwanted liner processing odors shall be attached to the sanitary clean out. The CONTRACTOR shall provide air monitoring ensuring that discharge from the liner processing is safe and meets OSHA permissible levels. The carbon charcoal filter shall be CIPP Filter ™ by LMK Pipe Renewal, 1131 NW 55th Street, Fort Lauderdale, Florida 33309, 954-772-0075, or proven equal.

C. Cured-in-place Pipe Lining for Laterals shall conform to Section, 01010, Part 3.

PART 2 PRODUCTS

2.1 PRODUCTS AND INSTALLER ACCEPTABILITY

A. To minimize the OWNER's long-term risk, all sewer products shall have a minimum 50-year design life, and only products that comply with industry standards are considered. OWNER

B. Products and installers must document the following minimum criteria to be deemed commercially acceptable:

Product	Unit	Minimum Contractor Experience for Submitted Product	Minimum Product Installation History in a Sanitary Sewer
Lateral Liner	LF	20,000	2,000,000
Main/Lateral Connections	EA	1,000	100,000

Stack Single or Double Wye	EA	100	10,000
Lateral Transitions	EA	100	10,000
Installation History	Years	2	20

C. For materials and product to be considered commercially proven, the above referenced minimum units of successful wastewater collection system installations must be documented to the satisfaction of the OWNER to assure commercial viability of the proposed liner system. If the product has undergone any modifications in the past two (2) years (installation methods, resin system, liner materials, assemblies, gasket seals, curing methods, the CONTRACTOR shall include the date in description of any changes made to the system. The most current version of the proposed liner system must meet the minimum installation history as listed in the table above. OWNER

D. All sewer rehabilitation products submitted for approval must provide third party test results supporting the long-term performance and structural strength of the product OWNER.

E. The CONTRACTOR (not a single employee) must meet the minimum requirements above. CONTRACTOR

2.2 MATERIALS

A. *Liner Assembly:* The liner assembly shall be continuous in length and consist of one or more layers of resin absorbent needle textile. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause delamination. The textile main and lateral tube assembly shall be constructed to fit a specific service lateral pipe and it's designed for the inflation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to accommodate irregular pipe sections. The resin saturated textile tube shall be resin saturated having 5% to 10% excess resin as required in ASTM F1216, Section 7.2, and when compressed and cured, shall meet or exceed approved design thickness.

B. *Mainline Liner Tube:* The mainliner tube shall be formed from a flat sheet of reinforced resin absorbent textile designed specifically for CIPP applications. The forming of the tube is accomplished by wrapping the sheet around the inflatable main bladder and sized accordingly to create a circular lining equal to the inner diameter of the lined main pipe. The interior of the textile sheet shall be laminated with an impermeable, translucent flexible membrane. The textile sheet before insertion shall be permanently marked on the membrane that is compatible with the resin system. The text al she before insertion shall be permanently marked on the membrane as "Lateral Identification" correlating to the address of the building the lateral pipe provides service.

C. *Lateral Liner Tube:* the exterior of the lateral liner tube shall be laminated with an impermeable, translucent flexible membrane that is compatible with the resin system. Longitudinal seams in the tube shall be stitched and thermally sealed. The lateral tube shall be airtight and continuous in length. The lateral tube shall be capable of conforming to offset joints, bends, bells, disfigured pipe sections and pipe diameter transitions.

D. *Mainline Connection:* The main tube and the lateral tube should be a one-piece assembly by stitching the lateral tube to the mainsheet around the aperture. The connecting end of the lateral tube shall be shaped to match the curvature of the mean tube. The main/lateral tube assembly shall take the shape of a "TEE" or "WYE" mainline connection. CONTRACTOR submittals for the liner assembly must include the manufacturers assembly methods and test protocol for the main/lateral liner assembly prior to resin saturation.

E. *Gasket Seals:* The main line connection gasket shall consist of a molded 3" wide flange having a 1.5" long tubular extension that protrudes into the lateral pipe. The lateral tube shall include

two (2) molded O-ring gaskets attached no less than 6-inches from the terminating end of the tube. The gasket seals must be produced in a cavity mold using hydrophilic Neoprene® rubber with a minimum 800% expansion by volume. The gasket must be a minimum of 2.5 mm thick and must retain this minimum thickness under installation pressures. The molded Neoprene® gasket seals shall meet the minimum requirements of the latest version of ASTM F3240 "Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long Term Watertightness of Cured-in-Place Pipe Rehabilitation of Main and Lateral Pipelines. Submittals shall include independent laboratory test results verifying compliance to ASTM F3240.

Note: Hand applied caulk (cured or uncured) are inconsistent and are not acceptable alternative to the required ASTM F3240 molded Neoprene gaskets.

F. *Gasket Seal Test Data:* The hydrophilic gasket seals shall include test data that supports substantial expansion properties so to form a watertight compression connection seal and end seal. The test protocol shall stimulate subterranean conditions and hydraulic loading at the surface. Gasket seal submittals must include test data stimulating hydration/dehydration conditions for a period of 10,000 hours and the test results must successfully demonstrate and document long-term performance without deterioration, loss of material, flexibility, and expansion of the gasket during repeated cycles of hydration and dehydration. Hydrophilic neoprene gasket submittals by the CONTRACTOR shall include independent laboratory test results.

G. *Bladder Assembly:* The liner assembly shall be surrounded by a second impermeable, inflatable, invertible, flexible translucent membrane bladder that will form a liner/bladder assembly. The translucent bladder shall facilitate vacuum impregnation while monitoring the resin saturation process. The bladder when inverted in the pipe shall press the liner's resin surface tight against the pipe wall and extend past the end of the liner ensuring the liner ends are open and no robotic cutting is required.

2.3 RESIN SYSTEM

A. The resin/liner system shall conform to ASTM D5813 Section 8.2.2. Certification to be submitted to the OWNER.

B. The resin shall be hey corrosion resistant polyester, vinyl ester, epoxy or silicate resin and catalyst system that when properly cured will meet the minimum design and chemical resistance requirements of ASTM F1216

Table 1 CIPP INITIAL STRUCTURAL PROPERTIES

Property	ASTM Test	Minimum Value PSI	(MPa)
Flexural Strength	D-790	4,500	(31)
Flexural Modulus	D-790	250,000	(1,724)

C. Raw material sampling and identification compared between that required in the contract specifications, submitted by the CONTRACTOR, and verified by independent testing. CONTRACTOR shall submit Spectroscopic testing results, including material wavelength comparison of proposed resins to verify compliance to contract specified resin quality requirements.

2.4 DESIGN CONSIDERATIONS

A. The Main/Lateral CIPP shall be designed per ASTM F1216, Appendix X1.

B. The Main/lateral CIPP design shall assume no bonding to the original pipe.

C. The design assumes the resin saturated surface is in contact with the pipe to allow for resin migration.

D. The interior surface of the CIPP must be smooth with minimal wrinkles, include an impermeable inner film, and have an average roughness coefficient "n" factor 0.010.

E. The final installed thickness of the Main/Lateral shall be as per the design submitted and approved by the ENGINEER.

2.5 REFERENCEDINDUSTRY STANDARDS

A. ASTM F-2561, "Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main using a One-Piece Main and Lateral Cured-in-Place Liner, "most current version

B. ASTM F3240, "Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Water Tightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines", most current version.

C. ASTM F1216- "Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube," most current version

D. ASTM F3097, "Standard Practice for Installation of an Outside Sewer Service Cleanout through a Minimally Invasive Small Bore Vacuum Excavation", most current version.

E. ASTM D-790- "Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials," most current version.

F. ASTM D-792 – "Standard Test Methods for Density and Specific Gravity of Plastics by displacement," most current version.

G. ASTM D-2990 – "Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep Rupture of Plastics,", most current version.

H. ASTM D5813 – "Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe", most current version.

I. ASTM F477 "Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe", most current version. NOTE: ASTM 2561 references several complementing standards; one of which is ASTM F1216. The ASTM F1216 standard it's referenced for its nonmandatory design considerations for a CIPP listed in Appendix X1. The F1216 standard does not describe any materials or methods for rehabilitation and sealing of Main/Lateral connections. The F1216 standard does not include gasket seals and includes allowable leakage rates. The ASTM F2561 and F3240 standards provide methods and materials that work in conjunction with ASTM F1216 and F1743 for mainline CIPP where a long-term watertight sewer collection system is required.

PART 3 EXECUTION

3.1 INSTALLATION RECOMMENDATIONS

A. *Access Safety:* Prior to entering access areas such as manholes, and excavation pit, performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state, or federal safety regulations.

B. *Inspection:* Main and Lateral pipes shall be inspected per PACP/ LACP NASSCO standards.

1. The interior of the pipeline should be carefully inspected to determine the location of any condition that shall prevent proper installation, such as roots, severe offsets, and collapsed or crushed pipe sections. Experienced personnel trained and locating breaks, obstacles and service connections by closed circuit television shall perform inspection of pipelines.

2. The inspection shall include taking and recording main pipe diameter measurements at the upstream and downstream manholes.

3. The inspection shall include taking and recording lateral pipe diameter measurements at the main connection and at the termination of the lateral inspection where the cleanout will be installed according to project plans.

4. The inspection shall include locating the camera and marking the exact location where the clean out will be installed.

C. *Lateral Pipe Cleanout:* A service lateral cleanout shall be installed in the public Right-of-way at the property line or as directed by the engineer.

1. Materials and installation shall conform to ASTM F3097 "Standard Practice for Installation of an Outside Sewer Service Cleanout Through a Minimally Invasive Small-bore Vacuum Excavation." The cleanout shall provide upstream and downstream access to the lateral pipe. Reference Section 02759 SANITARY CLEAN OUT.

2. For multi-story buildings and buildings where the sewer service cannot be interrupted, the CONTRACTOR shall install two (2) cleanouts in accordance with ASTM F3097 with a minimum separation of 18 inches.

D. *Lateral Pipe Plugging:* Prior to inserting a resin saturated liner, the surface pipe will be taken out of service by inserting an inflatable plug on the upstream side of the clean out. The plug ensures no sewage flow enters the pipe potentially contaminating the resin saturated liner. The temporary plugging also prevents any sewer gases, steam or CIPP emissions from migrating into the building through dry fixture traps. For buildings where the service flow cannot be interrupted, the CONTRACTOR shall plae and inflatable plug between the first and second clean out. System flow shall be pumped from the upstream cleanout to a dedicated downstream manhole.

E. *Main Pipe Plugging*: The upstream basin flow shall be stopped by inserting an inflatable plug at the upstream manhole and pumping the system flow to a designated downstream manhole. The pumping system shall be sized for peak flow conditions. The upstream manhole shall always be monitored, and an emergency deflating system shall be incorporated so that the plugs may be removed at any time without requiring confined space entry. See section 02750 WASTEWATER FLOW CONTROL.

F. *Final Cleaning and Inspection* - With all system flows removed, the main and lateral shall be

hydraulically flushed to remove any remaining debris. Experienced personnel using CCTV shall confirm the main and lateral pipes are completely and properly prepared for the insertion of the resin saturated liner assembly.

G. *Resin Impregnation:* The liner assembly positioned within the bladder (liner/ bladder assembly), shall be saturated with the approved resin system under controlled negative pressure in conditions suitable for proper resin saturation. The volume of the resin used shall be sufficient to fill all voids in the textile at nominal thickness and diameter. The volume should be adjusted by adding 5% to 10% access resin for the change in resin volume due to Polymerization and to allow for any migration of resin into the cracks and open joints defects in the original pipe. No dry or unsaturated area in the main liner sheet or lateral tube should be acceptable upon visual inspection. Submittal, by the CONTRACTOR, of liner saturation and cure logs must be provided to the OWNER.

H. *Liner Insertion and Robotic Positioning:* The lateral tube is inserted into the launching hose. The main liner tube shall be wrapped around a launching device, and temporarily secured by use of rubber bands. The mainline connection gasket shall be attached to the mainliner tube by using stainless steel snaps. The launching device and resin saturated liner assembly are towed through the main pipe and robotically positioned at the service lateral connection.

I. *Inflation and Inversion:* The main bladder shall be inflated pressing the mainliner tube with the flange connection gasket firmly into contact with the lined main pipe, and the tubular portion of the connection gasket is inserted into the lateral pipe. The lateral liner tube is inverted through the main tube aperture by the action of the lateral bladder and extend into the lateral pipe to a termination point that shall be no less than 18- inches and no greater than 36-inches from the clean out. Two (2) O-Ring End Seals shall be positioned within 6-inches of the terminating end of the lateral liner tube, adjacent the clean out. All ends of the liner tube assembly shall remain open whereas no cutting of the cured liner is required.

3.2 CIP- LATERAL PROCESSING

A. *Curing:* A controlled mixture of compressed air and steam is circulated through the resin saturated liner. The heating equipment shall be capable of delivering a mixture of steam and air throughout the liner bladder assembly to uniformly raise the temperature above the temperature required to cure the resin. The curing of the CIPP shall consider the existing pipe material, the resin system, and the ground conditions (temperature, moisture level, and thermal conductivity of the soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturers recommended cure and cool down schedule shall be submitted, prior to the start of curing, and followed by the CONTRACTOR.

B. *CIPP Processing:* curing shall be accomplished without pressure interruption The curing process is complete when the temperature of the CIPP, after cooldown, reaches 100 degrees Fahrenheit or less. Once the finished CIPP has been properly cooled, the inflation of the bladder is stopped, the installation equipment and the bladder are removed from the pipe.

3.3 FINISH

A. The Finished CIPP shall produce a homogeneous Main/Lateral CIPP liner assembly. The main connection tube shall be no less than 18-inches in length. The CIPP shall extend into the lateral service pipe for a specific length terminating near the clean out. The CIPP shall be smooth with minimal wrinkling and shall increase flow rate. The CIPP shall be free of dry spots, lifts, and delamination. After the work is completed, the installer will provide the OWNER with video footage documenting their repair and the visual placement of the gasket seals and the building address number on the CIPP Lateral Identification label. The gasket placement at that

connection and at the end of the lateral portion shall be a visible reflection, during the final CCTV inspection to confirm that they are positioned properly. The finished product shall provide a variable non-leaking connection between the main line liner and the CIPP lateral liner.

3.4 RECOMMENDED INSPECTION AND TESTING PRACTICES

A. Resin Quality- As defined in section 2.3c, resin type and quality shall be verified through Spectroscopic evaluation before installation

B. Resin Quantity- As defined in section 3.1g, resin volume saturated and lateral tube verified from review of wet-out report and manufacturers resin saturation recommendations.

C. Corrosion Resistance - Certification verification, by the inspector, as defined in section 2.3a

D. Preparation - Pre-CCTV review, by the inspector, as per section 3.1f before lateral liner installation.

E. Curing- Inspector verification as defined in section 3.2a

F. *Sampling:* As designated in the purchase agreement, the preparation of a CIPP sample is required for each lateral liner installed. The sample shall be prepared by securing a flat plate mold using the textile tube material and the resin system as used for the rehabilitated pipe.

G. *Pressure:* The pressure applied on the plate sample will be equal to the highest pressure exerted on the lateral tube during the inversion process.

H. *Length:* The minimum length of the sample must be able to produce at least five specimens for testing in accordance with ASTM D-790-03

I. *Conditioning:* Condition the test specimens at 73.4 +/- 3.6 degrees Fahrenheit (23 +/- 2 degrees Celsius) and 50 +/- 5% relative humidity for not less than 40 hours prior to test in accordance with practice ASTM D-618, for those tests where conditioning is required.

J. *Short-Term Flexural (Bending) Properties:* The initial tangent flexural modulus of elasticity and flexural stress shall be measured for gravity and pressure pipe applications in accordance with Test Method D790 and shall meet the minimum requirements of Table 1.

K. *CIPP Thickness:* Cured sample wall thickness shall be obtained by measuring the cured thickness of the flat plate mold sample prepared as per 3.4f here in. Measurement shall be in a manner consistent with ASTM D5813, Paragraph 8.1.2

L. *Gravity Pipe Leakage Testing:* if required by the OWNER in contract documents or purchase order, gravity pipes should be tested using an air test method where a test plug is placed adjacent to the upstream and downstream ends of the main sheet CIPP and at the uppermost end of the lateral tube. This test is limited to pipe lengths with no service connections. The test pressure shall be 4 PSI for a test time of three minutes; the pressure shall not drop below 3.5 PSI.

3.5 WARRANTY

The CONTRACTOR guarantees the materials and workmanship to be free from defects for a period of five years from the date of acceptance. During the warranty period, under normal domestic sewer use, any defect found in the CIPP that affects the structural capacity or water tightness of the installed pipe should be repaired at the CONTRACTOR's expense.

END OF SECTION

SECTION 02771
CURED-IN-PLACE PIPE LINING-
CAPPING NON-ACTIVE LATERAL CONNECTIONS

PART 1 GENERAL

1.1 SCOPE OF WORK

A. The work required covers material requirements, installation practice, and test methods for using a short liner cap of structural Cured-In-Place Pipe (CIPP) liner and hydrophilic seal material to cover a lateral connection, to effectively abandon the service and provide a watertight connection seal. The materials and installation practices shall adhere to the structural and chemical resistance requirements described in ASTM F1216. The gasket sealing material for forming a watertight seal shall adhere to the material requirements as described in ASTM F3240.

B. A non-active sewer service lateral shall be abandoned using a resin absorbent short liner and a thermo-set resin with physical and chemical properties appropriate for the application. The short liner together with the hydrophilic seal material is positioned in a main pipeline, covering the connection to a lateral pipe. A watertight seal is made by a solid disk of expandable rubber (hydrophilic) that is positioned between the main pipe and the liner.

1.2 GENERAL

A. The lateral connection seal shall be accomplished by inflation of an inflatable plug that presses a resin impregnant short liner an expandable seal against the main pipe covering the service connection.

B. The short liner shall be formed from a flat sheet of resin absorbent material suitable for CIPP. The forming of the tube shall be accomplished using a textile sheet 24-inches in length and a width sufficient to create a circular lining equal to the inner diameter of the main pipe by one endo of the sheet overlapping a second end.

C. The short liner shall be outfitted with a disc shaped hydrophilic gasket specifically designed for abandoning a sewer service connection. When cured, the liner shall extend over a predetermined length of the main pipe and the disc shaped gasket shall cover the service pipe opening at the main connection.

D. CIPP Products shall include design calculations in accordance with ASTM F1216, Appendix X1 stamped by a Florida licensed professional ENGINEER. The installation CONTRACTOR must use an approved product, have successful cured- in- place- pipe (CIPP) installation track record, and is certified by the short liner technology provider.

E. All sewer rehabilitation products submitted for approval must provide third party test results supporting the long- term performance of the products and the test results must be approved by the OWNER.

1.3 DESIGN CONSIDERATIONS

A. The CIPP Shall be designated per ASTM F1216, Appendix X1.

B. The CIPP design shall assume no bonding to the main pipe.

C. The liner mist be smooth and have an average roughness coefficient "n" factor of 0.009.

D. The short liner end thickness shall taper to the main pipe size providing a smooth transition to minimize obstruction of flow.

1.4 REFERENCED STANDARDS

A. ASTM F1216- "Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube," most current version.

B. ASTM F1743- "Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation for Cured-in-Place Thermosetting Resin Pipe (CIPP)1

C. ASTM D-790- "Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials," most current version.

D. ASTM D-792 – "Standard Test Methods for Density and Specific Gravity of Plastics by displacement," most current version.

E. ASTM D-2990 – "Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep Rupture of Plastics,", most current version.

F. ASTM D5813 – "Standard Specification for Cured-in-Place Thermosetting Resin Sewer Pipe", most current version.

G. ASTM F3240, "Standard Practice for Installation of Seamless Molded Hydrophilic Gaskets (SMHG) for Long-Term Water Tightness of Cured-in-Place Rehabilitation of Main and Lateral Pipelines", most current version.

H. Warranty- CONTRACTOR warrants the liner to be free from defects for five (5) years from the date of installation. During the warranty period any defects which affects the flow or water tightness of the abandoned sewer service Shelby repaired at the CONTRACTORs expense.

PART 2 PRODUCTS

A. *Cap-a-connection™*
LMK Technologies, LLC
1779 Chessie Lane
Ottawa, IL 61350
815-433-1275
www.lmktechnologies.com

or approved equal.

B. MATERIALS

1. *Short Liner:* The short liner shall consist of one or more layers of absorbent textile that meet the requirements of ASTM F1216 and ASTM D5813 Sections 6 and 8. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause delamination in the CIPP. The resin absorbent textile shall be constructed to withstand installation pressures and have sufficient strength to bridge the opening of the lateral service pipe.

2. *Hydrophilic Gasket Seal:* a solid disc shaped gasket shall be attached to the resin saturated short liner. The gasket shall be a minimum of 2.5mm thick and shall retain this consistent thickness under installation pressures. The hydrophilic gasket seal shall

be manufactured in a controlled factory environment with strict quality control and quality assurance protocols.

3. *Gasket Seal Submittals:* Submittals shall include test data documenting repeated cycles of hydration/dehydration conditions for a period of 10,000 hours. The test results must successfully demonstrate and document long- term performance without deterioration, loss of material, flexibility, and expansion of the gasket throughout the test period.

C RESIN SYSTEM

a. The resin/liner system shall conform to ASTM D5813, Section 8.2.2.

b. The resin shall be a corrosion resistant polyester, vinyl ester, or epoxy resin and catalyst system, that when properly cured within the composite liner assembly, meets the requirements of ASTM F1216, the physical properties herein and those which are to be utilized in the design of the short CIPP liner for this project.

c. The resin shall produce a CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.

d. CIPP Initial Structural Properties per Table 1.

Table 1

PROPERTY	**STANDARD**	**MINIMUM VALUE**
Flexural Strength	ASTM D-790	4,500 psi (31 MPa)
Flexural Modulus	ASTM D-790	250,000 psi (1,724 MPa)

PART 3 EXECUTION

3.1 GENERAL

A. *Access Safety:* Prior to entering access areas such as manholes, and excavation pit, performing inspection for cleaning operations, and evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with the local comma state or federal safety regulations.

B. *Cleaning:* The pipe shall be cleaned by the CONTRACTOR, and be free of roots, grace and debris that will affect the proper installation of the short liner and gasket seal

C. *Plugging:* During insertion, the main pipe flow will be plugged. Flows must be always controlled and when necessary, flows shall be bypassed. When flows are bypassed, a pumping system sized for peak flow conditions shall be used. The upstream manhole shall be always monitored, and an emergency deflating system will be incorporated so that the plugs may be removed at any time without requiring confined space entry.

D. *Inspecting the Pipe:* The main pipe shall be carefully inspected using CCTV to determine the location of and identified non-active service lateral. The area of the connection shall be free from roots, grease, debris and suitable for installing the short liner.

3.2 INSTALLATION

A. *Resin Impregnation:* The short liner shall be saturated with the approved resin system under controlled conditions. The volume of resin used shall be sufficient to completely saturate the textile sheet. No dry or unsaturated area in the main line sheet shall be allowed.

B. *Installation:* The short liner is wrapped around an approved inflatable plug and the solid rubber disc shaped gasket is attached to the liner. The short liner is then inserted into the main pipe and positioned at the selected service lateral connection. The inflatable plug is inflated pressing the short liner firmly into contact with the main pipe, so the solid disc shaped gasket covers the sewer service connection.

C. *Curing:* The liner can be cured at ambient temperatures or heat cured. The curing process shall consider the existing pipe material, the resin system, and the ground conditions (temperature and moisture level, and thermal conductivity of the soil). An approved cure log shall be used to log the resin mixing, ambient temperature, resident temperature, saturation time, inflation pressure and overall cure times. If an external heat source is used, input and output temperatures shall be monitored and logged during the cure and cooldown cycles.

D. *Hydrophilic Gasket Seal:* The gasket shall begin to swell after 24 hours in response to the moisture content in a sewer. The gasket will expand up to 800% by volume forming a watertight seal between the main pipe and the short liner.

E. *Finish:* The CONTRACTOR shall provide the OWNER with a PACP compliant video inspection showing their repair. The finished product shall provide a structural verifiable non-linking short liner and gasket assembly, that abandons a sewer service connection.

SECTION 02958
STRUCTURAL MANHOLE LINING

PART 1 GENERAL

1.1 DESCRIPTION

A. This section includes work required for the various types of manhole linings identified in the repair schedule contained in the plans. The materials and methods included in this section are designed to eliminate infiltration through manhole walls and enhance structural integrity of severely deteriorated manholes. Materials of lining are spray applied Polymeric (epoxy and polyurethane) resins.

1.2 SUBMITTALS

A. CONTRACTOR shall submit manufacturers technical literature on material and description of installation method including but not limited to:

1. Requirements for application such as temperature and humidity.
2. Requirements for worker safety, such as ventilation and safe handling procedures.
3. Maximum storage life.
4. Mixing and proportioning requirements for specific application.
5. Pot life
6. Curing time
7. Physical properties
8. Test results on resistance to abrasive chemicals

1.3 QUALITY ASSURANCE

A. Product application shall be performed only by Workman trained and experienced with specified and trained in confined space entry.

1. Certification: Applicators for spray- applied coating installation shall be certified by the manufacturer.

2. CONTRACTOR Experience: Minimum five (5) years of experience with similar applications of the materials specified.

PART 2 PRODUCTS

2.1 SPRAY APPLIED RESINS

A. The spray-applied coating shall be resistant to hydrogen sulfide gas, sulfuric acid, and other chemical typically found in sanitary sewers.

B. The spray-applied coating shall be either Raven coating system, or IET coating system or approved equal. The liner shall confirm to the minimum physical requirements listed below.

Compressive strength, (ASTM D695)	10,500 psi
Flexural modulus (initial), ASTM D790	73,500
Flexural strength, ASTM D790	12,000 psi
Bond strength, ASTM D4541	Must exceed substrate tensile strength
Tensile strength, ASTM D638	7,000 psi
Chemical Resistance (ASTM D543)- Exposure to sodium hypochlorite (10%) and sulfuric acid (15%) for 168 hours	No degradation in physical or mechanical properties

PART 3 EXECUTION

3.1 GENERAL

A. All pipes in service shall be plugged or bypassed in accordance with Section 02750 before any work is started on the structure. No debris shall be flushed down the line.

B. Only personnel who are aptly trained in confined space entry shall be permitted to enter the structure. All OSHA requirements for confined space entry equipment and permanent shall be complied with. The CONTRACTOR shall obtain a confined space entry permit prior to beginning any work.

C. Liner shall completely cover cone, wall, chimney, bench and channel, as applicable, as one-piece solid liner. No voids, leaks, channels, or gaps may remain behind the installed liner.

D. Structural Manhole lining shall conform to Section 01010, Part 3.

3.2 PREINSTALLATION/ SURFACE PREPARATION

A. High-Pressure Grout: High pressure grow shall be injected from the interior of the manhole surfaces into cracks and voids to stop leaks. The use of hydraulic cement will not be allowed.

1. Suitable equipment shall be utilized for pumping the grout from the ground through a hose and injecting the grout under pressure to fill voids beyond the manhole structures. **The equipment shall have a means of measuring of grout used in gallons.**
2. Grout shall be used in accordance with the manufacturer's recommendations for specific application.
3. The following are acceptable grout products: Avanti AV-202 Multigrout or pre-approved equal.

B. Patching Cement: After all loose and deteriorated material has been removed from the interior surfaces of the manhole and after all leaks have been grouted, patching cement shall be applied to fill any irregularities to achieve an acceptable smooth surface.

1. Patching cement should be compatible with the liner material as specified in item 2.1

C. Evaluation of Atmosphere: prior to entering structures, and evaluation of the atmosphere shall be conducted to determine the presence of toxic, flammable vapors or possible lack of oxygen. The evaluation shall be in accordance with local, state, or federal safety regulations.

D. Clean manhole ring and covered free of rust and debris so the lid will properly seat when reinstalling the lid. Use power brushing such as wire wheel on a grinder/needle gun as most types of debris cannot be removed by hand wire brushing.

E. Surface is to be lined shall be cleaned and abraded to produce a sound surface with adequate profile and porosity to provide a strong bond between the lining and substrate.

F. High pressure water jetting (NACE Standard No. 5/ SSPC-SP12) abrasive (sand) blasting, and mechanical wire- brushing shall be the methods to remove previous coatings, laitance, contaminated, disintegrated or chalky material. Detergent water cleaning and hot water blasting may be necessary to remove oil and grease.

G. Use of acid for cleaning purposes no matter how dilute, will not be allowed. Loose or protruding brick, mortar and concrete shall be removed by using a Mason's hammer and chisel. Fill any large voids with quick setting cement patch mix recommended by the manufacturer of liner products. The surface to be repaired must be clean and free of any loose materials.

H. Application of liner shall not be made unless the ambient temperature inside the structure is 50 degrees Fahrenheit or higher and all manhole surfaces are sufficiently dry to ensure proper adhesion of the liner to the existing manhole walls.

I. After the patched areas have cured sufficiently, repair manhole wall surfaces in accordance with manhole liner manufacturers recommendations.

J. All resurfaced or repaired surfaces shall be inspected for cleanliness and suitability to receive spray-applied loaner. Additional surface preparation may be necessary prior to application.

K. Apply manhole liner in accordance with manufacturers recommendation regarding temperature and installation procedures and in accordance with the city of Fort Lauderdale specifications. The liner shall be applied to the invert and walls of the manhole from the bench up to the bottom of the casting.

L. Only manufacturer- certified personnel shall be permitted to install spray-applied liner.

M. Spray equipment shall be specifically designed to accurately ration and apply the coating products and shall be in good working order.

N. Prepared surfaces shall be lined by Sprite application to a minimum wet film thickness of 200 mils. During application, a wet film thickness gauge meeting ASTM D4414 shall be used. All necessary measurements shall be taken and attested to by the CONTRACTOR. Written reports signed by the CONTRACTOR shall be given to the OWNER and project manager.

O. Allow the final application to cure for time recommended by the manufacturer before being subjected to sewage flow, or installation of spray-applied liner (where indicated).

3.3 QUALITY CONTROL

A. Inspect lining system for holidays, crack and pin holes using the spark- test method and equipment in accordance with NACE RPO 188. Especially check the lining over brick, block, and very rough surfaces.

B. Repair voids and holidays per the manufacturer's instructions.

3.4 SAFETY

A. The CONTRACTOR shall carry out operations under this section in strict accordance with all applicable OSHA standards. Particular attention is drawn to those safety requirements involving entry into a confined space. It shall be the CONTRACTOR's responsibility to comply with OSHA standard and regulations pertaining to all aspects of the work.

3.5 WARRANTY

Provide a - five (5) year unlimited warranty and all workmanship and products. The work covered by the warranty shall include surface preparation, grounding, line application as well as other work performed under this section. The warranty shall be effective beginning on the date of the final acceptance by the City of Fort Lauderdale and shall guarantee that the manhole will be protected from leaks and from failure due to corrosion from exposure to hydrogen sulfide and other corrosive chemicals normally encountered in raw sewage.

END OF SECTION

SECTION 02958-01
IET COATING SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK

A. This specification provides details for furnishing and installing the Integrated Environmental Technologies (IET) coding system as shown on the standard details for protection of concrete structures against hydrogen sulfide corrosion. Coating materials shall be as manufactured by Integrated Environmental Technologies or pre-approved equal. Installation shall be performed by workers experienced in the application of the coding to be used.

PART 2 PRODUCTS

2.1 IET COATING SYSTEM

A. The IET Coating System shall be as distributed by Integrated Environment Technologies, Santa Barbara, VA or pre-approved equal.

B. Polymorphic resin shall be 100% solids, two-component, highly modified polyester resin system, exhibiting no adhesion-interfering shrinkage upon curing. Resin shall cure rapidly within 15 minutes to one hour without the use of heat or cooling out surface temperatures ranging from negative 40 degrees Fahrenheit to over 150 degrees. Excellent resistance to a broad range of corrosive chemicals, including sulfuric acid created by hydrogen sulfate gas as well as other chemicals typically found in sanitary sewer, and impact and abrasion attack shall be provided.

PART 3 EXECUTION

3.1 IET COATING

A. All pipes in service shall be plugged or bypassed before any work is started on the structure. No debris is to be flushed down the line.

B. Anyone entering the structure must conform to all OSHA requirements for "Confined Space Entry" equipment and permitting.

C. Surface preparation should meet the requirements of IET System Data Sheets on concrete preparation and interior surfaces of manhole shall be sound, porous, dry, and free of dust, dirt, oil, grease, and other contaminants prior to application of lining.

D. Interior surface of structure must be pressure washed at 5,000PSI and must be abrasive-blasted with black beauty steel slag to remove all loose patching, old coatings, and any contamination in the concrete. No silica sand shall be used.

1. "New" structures shall be abrasive blasted to remove all oils and patch mud end to open pin holes and expose aggregate.

2. "Rehab" structures shall be abrasive blasted to remove all loose patching, old coatings, and any contamination that penetrated the concrete. The finished interior of the structure shall be gray. The exposed invert/floor shall also be coded. Where there is severe deterioration of the mortar, place new concrete to match the original interior dimensions after abrasive-blasting and removal of all loose material and byproducts of corrosion. Restore invert/floor to the original elevation.

3. Vacuum to remove all abrasives and debris.

E. Repair all leaks by injecting grout using Avanti Multigrout AV-202 or pre-approved equivalent. Hydraulic cement should not be used to stop any water leaks.

F. Clean and remove dust material with pressure washing for maximum adhesion. Blow dry concrete at 250 CFM with 12 psi.

G. Apply IET Systems Coating by the use of the IET System Spray Unit and IET Systems Spin Caster. Apply IET coating at least three different intervals-prime coat (DS-101 25 mils thick), intermediate coat (DS-301 75 mils thick), and finish coat (DS-401 25 mils thick), per IET Systems manufacturer instructions and specifications. The total thickness of the IET coding shall be at least 125mils.

The cured resin system shall conform to the minimum physical standards, as listed below:

Flexural Strength	21,650 psi	ASTM D790
Tensile Strength	11,000 psi	ASTM D638
Tensile Modulus psi x 10^5	5.6 psi	ASTM D638
Tensile Elongation %	2.4	ASTM D638
Heat Distortion °F	214	ASTM D648
Barcol Hardness	42	ASTM D2583

The Contractor shall provide certified independent, third-party test results verifying the minimum physical properties listed above. The tests shall be in conformance with the ASTM specifications listed. The finished liner shall be cured in strict accordance with the manufacturer's instructions.

H. Inspect lining system for holidays, cracks, and pin holes. Take particular care to check lining over brick, block, heavy spalled surfaces, and other very rough surfaces and locate holes in the lining caused by voids in bricks, block, concrete in structure joints. Fill voids and holidays in accordance with the lining system manufacturers instructions.

I. Provide a 10-year unlimited warranty on all workmanship and products. The work includes the surface preparation and application of the IET Coating System, shall protect the structure for at least 10 years from all leaks, and from failure due to corrosion from exposure to corrosive gases such as hydrogen sulfide.

END OF SECTION

SECTION 02958-02
RAVEN COATING SYSTEM

PART 1 GENERAL

1.1 SCOPE OF WORK

A. This specification covers all labor, materials, equipment, and services necessary to complete the manhole rehabilitation work for using the Raven Coating System as here in specified.

1.2 SUBMITTALS

A. Product Data

1. Technical data sheet on each product used.

2. Material Safety Data Sheets (MSDS) for each product used.

3. Copies of independent testing performed on the coating product indicating the product meets the requirements as specified herein.

4. Technical data sheet and project specific data for repair materials to be top coated with the coating product(s) including application, cure time and surface preparation procedures.

B. CERTIFIED APPLICATOR COMPLIANCE

1. Current documentation from coding product manufacturer certifying CONTRACTOR's (Certified Applicator) training and equipment complies with the quality assurance requirements specified herein.

2Five (5) recent references of CONTRACTOR indicating successful application of coding product(s) of the same material type as specified herein, applied by spray application within the municipal wastewater environment.

3. Concrete Coating Applicator: Be approved by and have completed training program conducted by the Coating Manufacturer. The certificate is based on annual training and recertification.

1.3 QUALITY ASSURANCE

A. Coating product(s) shall be capable of being installed and curing properly within a manhole environment. Coating product(s) shall be resistant to all forms of chemical or bacteriological attack found in municipal sanitary sewer systems; and, capable of adhering to the manhole structure substrates.

B. Repair product(s) shall be fully compatible with the coating product(s) including ability to bond effectively forming a composite system.

C. CONTRACTOR shall be trained by, or have their training approved and certified by, the coating product manufacturer for the handling, mixing, application and inspection of the coating product(s) to be used as specified herein.

D. Inspectors shall be trained in the use of testing or inspection instrumentation and knowledgeable of the proper use, preparation, and installation of coating product(s) to be used

as specified herein.

ECONTRACTOR shall initiate and enforce quality control procedures consistent with the coating product(s) manufacturer recommends and applicable ASTM, NACE or SSPC standards as referenced herein.

F CONTRACTOR shall utilize equipment for spray application of the coating product(s) which has been approved by the coating product manufacturer; and, CONTRACTOR shall have received training on the operation and maintenance of said equipment from the coating product manufacturer.

G. Pre-construction meeting shall take place no less than two (2) weeks before CONTRACTOR mobilization. All parties to have a physical presence on the project during construction shall be present. At this meeting responsibilities and authorities during the project shall be discerned; comments and questions regarding materials and execution of these specifications shall be presented and addressed.

1.4 DELIVERY, STORAGE, AND HANDELING

A. Materials are to be kept dry, protected from weather, and stored under cover.

B. Protective coating materials are to be stored between 50 degrees Fahrenheit and 90 degrees Fahrenheit. Do not store near flame, heat, or strong oxidants.

C. Protective coating materials are to be handled according to their material safety data sheets.

1.5 SITE CONDITIONS

A. CONTRACTOR shall conform with all local, state, and federal regulations including those set forth by OSHA, RCRA, and the EPA and any other applicable authorities.

B. Confined space entry, flow diversion and/or bypass plans shall be presented by the CONTRACTOR as necessary to perform the specified work.

1.6 SPECIAL WARRANTY

A. CONTRACTOR shall warrant all work against defects in materials and workmanship for a period of 10 years, unless otherwise noted, from the date of the final acceptance of the project. CONTRACTOR shall, within a reasonable time after receipt of written notice thereof, repair defects in material or workmanship which may develop during said 10 years, and any damage to other work caused by such defects or the repairing of same, is at his own expense and without costs to the OWNER.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

A. Standard Portland cement or new concrete (not quick setting high strength cement) must be cured at a minimum of 28 days prior to application of the coating product(s.

B. Remove existing coatings prior to application of the coating product(s) which may affect the performance and adhesion of the coating product(s).

C. Thoroughly clean and prepare existing products to affect a seal with the coating product(s)

2.2 REPAIR AND RESURFACING PRODUCTS

A. Repair products shall be used to fill voids, bugholes, and/or smooth transitions between components prior to the installation of the coating product(s). Repair materials must be compatible with the specified coating product(s) and shall be used and applied in accordance with the manufacturer's recommendations.

B. Resurfacing products shall be used to fill large voids, lost mortar in masonry structures, smooth deteriorated surfaces and rebuild severely deteriorated structures.

C. The following products may be accepted and approved as compatible repair and resurfacing products for the use within the specifications:

1. 100% Solids, solventfree epoxy grout specifically formulated for epoxy top coating capability.
2. Factory blended, repair setting, high early strength, fiber reinforced, non-shrink repair motor that can be troweled or pneumatically spray applied may be approved if specifically formulated to be suitable for top coating with the specified coating product(s).

2.3 PROTECTIVE COATING PRODUCTS

A. Manufacturer: Raven Lining Systems, Broken Arrow, Oklahoma 800-324-2810, 918-615-0020 of FAX 918-615-0140.

B. Productive Coating: Raven 405 Series Epoxy (Raven 405 / 405FS) - 100% solids, solvent-free ultra-high-build epoxy system exhibiting the following characteristics:

1. Product type: amine cured epoxy
2. VOC content: (ASTM D2584) 0%
3. Tensile Strength, psi (ASTM D695) 18,000 (minimum)
4. Tensile Strength, psi (ASTM D638) 7,500 (minimum)
5. Flexural Modulus, psi (ASTM D790) 600,000 (minimum)
6. Adhesion to Concrete, mode of failure (ASTM D7234): Substrate (concrete) failure.
7. Chemical Resistance (ASTM D543/G20) all types of service for:

a. Municipal sanitary sewer environment
b. Sulfuric acid 30%
c. Hydrogen Sulfide Gas, all concentrations
d. Sodium hydroxide 5%

2.4 COATING APPLICATION EQUIPMENT

A. Manufacturer approved heated plural component spray equipment.

B. Hard to reach areas, primer application and touch-up may be performed using hand tools.

PART 3 EXECUTION

3.1 EXAMINATION

A. Appropriate actions shall be taken by CONTRACTOR to comply with local, state and federal

regulatory and other applicable agencies with regard to environment, health and safety during work.

B. All structures to be coded shall be readily accessible to CONTRACTOR.

C. New Portland cement concrete Structures shall have cured a minimum of 28 days since manufacture prior to commencing coating installation.

D. Any active service flows shall be damned, plugged or diverted as required to ensure all liquids are maintained below or away from the surfaces to be coated.

E. Temperature of the surface to be coated should be maintained between 40 degrees Fahrenheit and 120 degrees Fahrenheit.

F. Specified surfaces should be shielded to avoid exposure of direct sunlight or other intense heat source. Where varying surface temperature do exist, coating installation should be scheduled when the temperature is falling versus rising.

G. Prior to commencing surface preparation, CONTRACTOR shall inspect all surfaces specified to receive the coating and notify OWNER, in writing, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein.

3.2 SURFACE PREPARATION

A. Oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, or other contaminants which may affect the performance and adhesion of the coating to the substrate shall be removed.

B. Concrete and/or mortar damaged by corrosion, chemical attack or other means of degradation shall be removed so that only sound substrate remains.

C. Choice of surface preparation method(s) should be based upon the condition of the structure and concrete or masonry surface, potential contaminants present, access to perform work, and required cleanliness and profile of the prepared surface to receive the coating product(s).

D. Surface preparation method, or combination of methods, that may be used include high pressure water cleaning, high pressure water jetting, abrasive blasting, shot blasting, grinding, scarifying, detergent water cleaning, hot water blasting, and others described in NACE No. 6/SSPC SP-13. Whichever method(s) are used, they shall be performed in a manner that provides uniform, sound clean neutralized surfaces suitable for top coating with the coating product(s).

E. Infiltration shall be stopped by using a material which is compatible with the repair products and is suitable for top coating with the coating product(s).

F. Termination points of the coating product(s) shall be made at the bottom of the manhole frame, a minimum of 1" interfacing with each pipe penetration. The manhole frame and casting shall not be coated.

G. All manhole surfaces shall be sufficiently dry to ensure proper adhesion of liner to the exiting manhole walls.

3.3 APPLICATION OF REPAIR AND RESURFACING PRODUCTS

A. Areas where rebar has been exposed and is corroded shall be first prepared in accordance with Section 3.2. The exposed rebar shall then be abrasive blasted and coated with a corrosion

inhibiting impregnation coating.

B. Repair products shall be used to fill voids, bugholes, and other surface defects which may affect the performance or adhesion of the coating product(s).

C. Resurfacing products shall be used to repair, smooth, or rebuild surfaces with rough profiles to provide a concrete or masonry substrate suitable for the coating product(s) to be applied. These products shall be installed to a minimum thickness as recommended within manufacturer's published guidelines. Should structural rebuild be necessary, these products shall be installed to a thickness as specified by the PROJECT ENGINEER.

D. Repair and resurfacing products shall be handled, mixed, installed and cured in accordance with manufacturers published guidelines.

EAll repaired or resurfaced surfaces shall be inspected for cleanliness and suitability to receive the coating product(s). Additional surface preparation may be required prior to coating application.

F. The CONTRACTOR shall create a ¼" wide X ¼" deep keyway at the base, pipe penetrations and termination point of the protective coating system within the structure.

3.4 APPLICATION OF COATING PRODUCT(S)

A. Application procedures shall confirm to the recommendations of the coating product(s) manufacturer, including environmental controls, product handling, mixing, application equipment and methods.

B. Spray equipment shall be specifically designed to accurately ratio and apply the coating product(s) and shall be in proper working order.

C. CONTRACTOR's qualified in accordance with Section 1.4 of these specifications shall perform all aspects of coating product(s) installation.

D. Prepared surfaced shall be coated by spray application of the coating product(s) described herein to a minimum wet film thickness of 175 mils.

E. Subsequent top coating or additional coats of the coating product(s) shall occur within the products recoat window. Additional surface preparation procedures will be required if the recoat window is exceeded.

F. Coating product(s) shall interface with adjoining construction materials throughout the manhole structure to effectively seal and protect concrete of masonry substrates from infiltration and attack by corrosive elements. Procedures and materials necessary to effect this interface shall be as recommended by the coating product(s) manufacturer.

G. Terminate points of the coating product(s) shall be made at the bottom of the manhole frame, and a minimum of 1" interfacing with each pipe penetration. The manhole frame and casting shall not be coating.

H. Manhole inverts shall be coated.

I. Sewage flow shall be stopped, bypassed, or diverted for application of the coating product(s) to the invert and interface with pipe material.

3.5 TESTING AND INSPECTING

A. During application a wet firm thickness gauge, meeting ASTM D4414- Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages, shall be used. Measurements shall be taken, documented, and attested to by CONTRACTOR for submission

to OWNER.

B. After the coating product(s) have set in accordance with manufacturer instructions, all surfaces shall be inspected for holidays with high voltage holiday detection equipment. Reference NACE SPO188 for performing holiday detection. All detected holidays shall be marked and repaired by upgrading the coating surface with grit disc paper or other hand tooling method. After abrading and cleaning, additional coating can be hand applied to the repair area. All touch-up/repair procedures shall follow the coating manufacturers recommendations. Documentation on areas tested, results and repairs made shall be provided to OWNER by CONTRACTOR.

C. Visual inspection shall be made by the PROJECT ENGINEER and/or Inspector. Any deficiencies in the finished coating shall be marked and repaired according to the procedures set forth herein by CONTRACTOR.

D. The municipal sewer system may be returned to full operational service as soon as the final inspection has taken place.

END OF SECTION

SECTION 02958-03
TNEMEC EPOXYTEC CPP

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

A. This section defines the scope of work of the specification which includes executing surface preparation, cleaning, application of specified products, inspection and testing for general repairs and lining of newly installed, existing, and defective specified structures and surfaces by a monolithic application of a high build, 100% solids, structural epoxy system to seal infiltration/exfiltration, repair voids and deterioration, and provide enhanced corrosion protection as a total rehabilitative lining system.
B. Procedures for qualifying and are described herein. In addition to the lining system, different repair methods and procedures are listed in this specification. All structures scheduled for rehabilitation shall be cleaned, prepared, repaired, patched and/or sealed as required prior to the application of the structural epoxy system.

1.2 SCOPE OF WORK

A. The Contactor shall be responsible for furnishing all labor, supervision, products, materials, and equipment required to complete all rehabilitation work and testing in accordance with this Specification.
B. All Sections of this Specification are mutually complimentary and the overall intent is that the Contractor shall provide for everything in his portion of the work required to make a complete and operable job in every respect unless specifically noted otherwise.
C. It is the intent of this Specification to ensure that the work, as completed shall meet all applicable codes, ordinances, rules and regulations of every authority having jurisdiction in the area where the project(s) is located. Failure of the Contractor to point out items that do not meet such requirements does not relieve the Contractor or the Subcontractors of the responsibility of meeting them.
D. All supplies shall be stored and maintained by the Contractor in accordance with manufacturer's recommendations. Materials shall not be exposed to adverse conditions prior to the work. All materials shall be kept in secured area and away from general public access. The Contractor shall review and maintain all Safety Data Sheets (SDS), product labeling, and technical literature at the project site.

1.3 REFERENCES

A. The latest codes and standards referenced herein and belonging to the following organizations shall be followed:
    1. American Society for Testing and Materials (ASTM)
    2. National Association of Corrosion Engineers, NACE International (NACE)
    3. The Society for Protective Coatings (SSPC)
    4. Occupational Safety and Health Administration (OSHA)
    5. Resource Conservation and Recovery Act (RCRA)
    6. United States Environmental Protection Agency (EPA)
    7. Environmental Technology Verification (ETV)
    8. International Concrete Repair Institute (ICRI)
    9. National Association of Sewer Service Companies (NASSCO)
    10. National Sanitation Foundation (NSF)

11. Center for Innovative Grouting Materials and Technology (CIGMAT)
12. American Association of State Highway and Transportation Officials (AASHTO)

PART 2 – PRODUCTS

2.1 ACTIVE LEAK CONTROL (As Needed)

A. Active leak control materials are to be utilized to stop running water, infiltration, and other water stop needs.
B. All active leak control materials must be compatible with repair and lining materials.
C. Active leak control materials
    1. Hydraulic cement
        i. Quick setting, hydraulic cement compound designed for minor patching, and as a leak stopper and water plug, which stops running water and/or seepage through concrete.

        ii. Specified material(s) are listed below:

        Epoxytec Mortartec Hydrxx (#RCHY) by Epoxytec (epoxytec.com)
        877.GO.EPOXY
        FloridaProtectiveCoatings@Tnemec.com

    2. Chemical grout
        i. Chemical grout material used for grouting active leaks shall be injection hydrophobic polyurethane or equal.
        ii. While being injected, the chemical sealant must be able to react/perform in the presence of water.
        iii. The cured material must withstand submergence in water, without degradation.
        iv. The resultant sealant (grout) formation must be impervious to water penetration.
        v. The final sealant must withstand freeze-thaw and wet-dry cycles without causing adverse changes to the sealant.
        vi. The final sealant formation must not be biodegradable.
        vii. Chemical grouting material final cure must not exceed one (1) hour.
        viii. Chemical grouting material must be compatible to other specified top coating and repair material and the final topcoat of the structural epoxy system.

2.2 CONCRETE REPAIR (As Needed)

A. Concrete repair methods include isolated, sectional, and fully restorative methods including brick, concrete, and other masonry filling, patching, termination of materials, seams, anchors, and rebuilding based on various conditions in order to repair imperfections that adversely affects flow, would compromise the structure and liner in the future, and to restore the structure to a profile accepting to the lining system.
B. Concrete patching and rebuilding
    1. Concrete patching repair shall be performed for any spot repairs, filling or repairs of deep spalls, voids, gaps, bugholes/holes, and/or crevasses.
    2. Rebuild isolated structures, inverts, benches and/or troughs, or other flow structures requiring build-up and/or rebuild in order to provide smooth flow transition waterway with no distortion of flow or connections.

3. Materials
    i. The material is early-high strength, high build, sewer grade silica fume, fiber reinforced, industrial-grade modified mortar:

    ii. Specified material(s) are listed below:

Epoxytec Mortartec (#RCM01,02, RCME1, RCHY) by Epoxytec (epoxytec.com)
877.GO.EPOXY
FloridaProtectiveCoatings@Tnemec.com

C. Resurfacing
1. Concrete repair methods may also include resurfacing the substrate to create uniformity of the surface to accept coatings and to restore the substrate's profile. This will be required for any newly installed concrete structures to reduce the occurrences of outgassing, and for existing structures where degradation to substrate profile is greater than an ICRI CSP-6, and/or when the substrate requires restoration bringing profile to near-original.
2. Resurfacing thicknesses for existing structures, the thickness shall range between 1/4 inch and 1/2 inch (1/4" – 1/2"). For newly installed concrete structures, thicknesses shall be between 1/16 inch to 1/8 inch (1/16" – 1/8"). Should the substrate and structure require repair beyond half-inch, refer to "Concrete repair" for repairing materials beyond half-inch (1/2") thickness.
3. Materials
    i. The material is a fiber-reinforced, high build, corrosion resistant epoxy-modified-mortar, fortified with silica fume and micro silica. The hardened epoxy binder is dense and highly impermeable. The above performance is achieved by a complex formulation of mineral, organic resin and densifying agents and sophisticated chemical additives combined with next generation water-borne epoxy curing agents. Graded quartz sands are used to enhance particle packing and further improve the fluidity and hardened density. The composition also possesses excellent thin-section toughness, high modulus of elasticity and is self-bonding
    ii. The epoxy-modified-mortar shall exhibit excellent thin-section toughness and applied as low as 1/16 inch thickness, and capable of build-up up to 1-inch.
    iii. The epoxy-modified-mortar must be designed to accept the top coat structural epoxy at a minimum of two (2) hours after application at 77F.
    iv. The epoxy-modified-mortar can be applied by hand and/or wet-shot spray applied.
    v. The epoxy-modified-mortar shall not require any further preparation or conditioning within 36 hours (at 77F) to accept structural epoxy top coat applications.
    vi. Specified material(s) are listed below:

Epoxytec Mortartec Ceramico (#RCME1) by Epoxytec (epoxytec.com)
877.GO.EPOXY
FloridaProtectiveCoatings@Tnemec.com

D. Exposed reinforcing bars
1. Exposed reinforcing bars must be treated with rust inhibiting primer, and encapsulated/patched with high density mortar.

2. Materials
    i. Rust inhibiting primer must be epoxy-based, rust inhibiting primer designed for rapid curing, and for steel applications.
    ii. High density mortar patching will consist of any of the specified repair mortars within this section. Refer to “Concrete repair” for repairing materials.
    iii. Specified material(s) are listed below:

Epoxytec A1 Primecoat (#MP1R) by Epoxytec (epoxytec.com)
877.GO.EPOXY
FloridaProtectiveCoatings@Tnemec.com

2.3 LINING

A. General
    1. It is the intent of this section to provide for the waterproofing, sealing, structural reinforcement and corrosion protection of manholes and similar underground structures by the safe, quick and economical application of an ultra-high build 100% solids structural epoxy liner.
    2. This specification establishes the minimum standard for material and method of application for the structural reinforcement, sealing and corrosion protection of leaking and deteriorated manholes by lining with a 100% solids, high build structural grade epoxy. The structural epoxy liner shall be installed at a minimum thickness of 125 mils DFT (0.125”).
    3. The structural epoxy lining system will be used on surfaces in order to protect against corrosion and seal from I&I.
B. Materials
    1. Specified material(s) are listed below:

Epoxytec CPP #RC3 (and/or CPP Sprayable #C311S) by Epoxytec (epoxytec.com)
877.GO.EPOXY
FloridaProtectiveCoatings@Tnemec.com

PART 3- EXECUTION

3.1 GENERAL

A. All work shall be in strict accordance with the specifications and recommendation including application of all products as required and in accordance with manufacturer’s directions.
B. Contractor shall conform to all local, state and federal regulations including those set forth by OSHA, RCRA and the EPA and any other applicable authorities.
C. Products are to be kept dry, in a climate controlled environment, protected from weather and stored under cover. Products are to be stored and handled according to their safety data sheets. When freezing temperatures are expected in the area, the Contractor shall take measures to keep applied materials warm (as per manufacturer’s guidelines) and provide the required heat in the structure before repair work is started.

D. Any invert(s), channels, drains, or other openings shall be covered during construction operations to prevent loose materials from collection.
E. Bypassing and/or blocking of flow shall be done only with prior approval of the Owner. Contractor shall be responsible for transporting or pumping water to maintain operation of any flow, treatment, collection or distribution system while repairs or lining to structures are made.
F. The Owner shall supply water necessary for the project to the Contractor at no cost, from locations indicated by Owner prior to the start of the project. Contractor shall be responsible for transporting the water.
G. It shall be the contactor's responsibility to provide traffic control required by the particular location and/or jurisdiction.
H. Use approved equipment designed, recommended and/or manufactured by the material supplier specifically for the application of all materials.
I. Applicator shall initiate and enforce quality control procedures consistent with applicable ICRI, NACE, and/or SSPC standards and the repair/coating manufacturer's recommendations.
J. Examination
    1. Examine surface to receive rehabilitation prior to applying any materials. Notify Owners in writing if surfaces are not acceptable for rehabilitation and/or lining.
    2. All structures to be repaired and coated shall be readily accessible to the Applicator.
    3. Any active flows shall be dammed, plugged or bypassed as required to ensure that the liquid flow is maintained below the surfaces to be coated and that concrete to be coated has not reached moisture levels surpassing 90%. Flows should be totally plugged and/or diverted when coating any invert. All extraneous flows into the structures at or above the area coated shall be plugged and/or diverted until the structural epoxy coating has set hard to the touch.
    4. Temperature of the surface to be coated must be maintained between 65F and 110F during application. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated. Specified surfaces should be shielded to avoid exposure of direct sunlight or other intense heat source. Where varying surface temperatures do exist, coating installation should be scheduled when the temperature is falling versus rising.
    5. New Portland cement concrete structures shall have endured a minimum of 28 days since installation, prior to commencing epoxy structural coating installation.
    6. Prior to commencing surface preparation, Contractor shall inspect all surfaces specified to receive the coating and notify Owner, of any noticeable disparity in the site, structure or surfaces which may interfere with the work, use of materials or procedures as specified herein.

3.2 CLEANING AND PREPARATION OF SUBSTRATE

A. Surface preparation must be achieved immediately prior to utilizing any repair material and/or coatings; re-inspection and/or subsequent surface preparation may need to be repeated should conditions change after initial preparation.
B. All receiving surfaces shall be thoroughly cleaned and made free of all foreign materials including dirt, grit, roots, grease, sludge and all debris or material that may be attached to the substrate.
C. Surface preparation shall be performed on all specified surfaces to be lined or rehabilitated. Unless otherwise noted, all newly installed concrete structures should first undergo curing of minimum 28 days prior to surface preparation and rehab/lining execution.

D. The objective of surface preparation is to produce a surface that is suitable for application and adhesion of the specified protective coating system and repair products.
    1. Protrusions such as from burrs, sharp edges, fins, and concrete spatter shall be removed during surface preparation.
    2. Voids and other defects that are at or near the surface shall be exposed during surface preparation.
    3. All concrete that is not sound shall be removed so that only sound concrete remains.
E. Surface preparation must achieve a clean and sound substrate in accordance with SSPC-SP13/NACE No. 6 "Surface Preparation of Concrete."
    1. High pressure water cleaning or waterjetting, and/or pre-approved dry or wet abrasive blasting may be necessary in order to achieve acceptable surface preparation free of all foreign material, laitance, oils, grease, incompatible existing coatings, waxes, form release, curing compounds, efflorescence, sealers, salts, and/or other contaminants.
    2. An ICRI profile of CSP 5 or higher shall be achieved.
    3. For existing structures, surface preparation shall yield an acceptable pH requirement.
    4. No surface water or active leaks are to be present. Prepared concrete surfaces shall be tested for residual moisture after cleaning and drying, and prior to the application of the coating. Drying may be required with forced air and/or dry heat to achieve moisture levels below 80% prior to coating.
    5. When grease and oil are present within the structure, an approved detergent or degreaser may be used integrally with the high pressure cleaning water if conditions dictate.
F. All materials resulting from the cleaning shall be caught at the base of each structure and removed prior to applying specified products.
G. All loose or defective concrete, mortar, brick, grout, ledges, steps and protruding ledges shall be removed to provide an accessible and uniformed surface prior to application of materials.

3.3 ACTIVE LEAK CONTROL PROCEDURE

A. Execution
    1. When leaks are not readily identifiable upon cleaning operation, use blowers to dry interior for positive identification of leaks and weeping areas.
    2. Hydraulic cement
        i. The work consists of hand applying a dry quick-setting cementitious mix designed to instantly stop running water or seepage in all types of concrete and concrete structures. The certified applicator shall apply material in accordance with manufacturers' recommendations.
        ii. The area to be repaired must be clean and free of all debris.
        iii. Proper applications should not require any special mixing of product or special curing requirements after application.
    3. Chemical grout
        i. Application of materials shall be by injection method only.
        ii. Mixing and handling of all the chemical grout materials shall be in strict accordance with manufacturer's recommendations.
        iii. All excess chemical grout must be removed from the surface via mechanical grinding means and top patched with Hydraulic cement.

3.4 CONCRETE REPAIR METHODS

A. All loose, cracked and corroded materials shall be removed from the area, exposing a sound substrate.

B. The materials shall be formed, trowel-applied, or shotcrete sprayed utilizing proper equipment on to specified surfaces. Follow instructions as published by the material manufacturer. If spraying, consult manufacturer for proper instruction and material version.

C. Concrete patching and rebuilding
    1. Execution
        i. Once cured, and before applying any lining system materials, refer to material specifications for post-cure preparation and readiness instructions. Follow mixing, application and handling instructions as written per materials product technical data sheets and SDS.
        ii. Apply materials and allow proper curing times prior to coating/lining.

D. Resurfacing
    1. Execution
        i. Follow mixing, application and handling instructions as written per materials product technical data sheets and SDS.
        ii. The mortar kits come pre-proportioned, for hand applications- use full kits as supplied, no do not any extra water.
        iii. For spray applications, water may be added, but limited, as specified by the Manufacturer.
        iv. When mixed, a paste-like material will develop which may be troweled, sprayed, cast, pumped or gravity-flowed applied.
        v. This mortar will harden quickly without any need for special curing. Therefore, execute finishing work by trowel immediately after applying or disbursing onto the substrate.
        vi. Either commence spraying or hand applying.
        vii. The epoxy-modified-mortar shall be applied at a 1/4 inch minimum, and 1/2 inch maximum (1/4" – 1/2") for existing infrastructure. And between 1/16 inch and 1/8 inch (1/16" – 1/8") for newly installed structures.
        viii. Finish with trowel.
        ix. Allow at least two (2) hours (77F) to cure, minimum, before applying the specified structural epoxy coating, but do not exceed thirty-six (36) hours. The window and condition to apply the structural epoxy coating remains open for 36 hours. Should this window expire, consult with manufacturer for written and approved guidance and instruction.

E. Exposed reinforcing bars
    1. Execution
        i. Prepare and clean via SSPC-SP 11 exposed reinforcing bars then clean with solvent (SSPC SP-1).
        ii. Treat with an epoxy-based, rapid-setting, rust inhibiting primer.
        iii. Allow primer to cure.
        iv. Patch with concrete patching materials as specified in "Concrete patching and rebuilding" section. Follow product and manufacturer execution specifications accordingly.

3.5 LINING METHOD AND PROCEDURE

A. Execution
    1. Application procedures shall conform to the recommendations of the structural epoxy coating manufacturer, including material handling, mixing, safety, and application equipment.

2. Top coating or additional coats of the structural epoxy coating should occur as soon as the prior coat becomes tack free, but no later than the recoat window for the specified material(s). Additional surface preparation procedures will be required if this recoat window is exceeded.
3. Follow all published and manufacturer recommended application methods.
4. If spraying, the Contractor must be certified to spray by the coating manufacturer verifying training and that the spray equipment is approved by the coating manufacturer, specifically designed to accurately ratio and condition the specified structural epoxy coating materials. Refer to the manufacturers' spray instruction and procedure prior to procuring material and applying any material in order to receive proper material variations and application considerations.
    i. Apply at a minimum thickness of 125 mils DFT (0.125 inches).
5. If trowel-applied, properly mix and apply materials to all specified surfaces by hand-applied methods with trowel or trowel-type tools.
    i. Combine 2 gallons kits, Part B to Part A of the packaged material, mix with a low-speed drill mixer for five (5) minutes until a homogenous blend is achieved.
    ii. Trowel the surface or section: for finishing, allow product to start initial gel (circa 30 minutes at 77F) and rub down with water to create a smooth, uniform finish.
    iii. Apply at a minimum thickness of 125 mils DFT (0.125 inches).
6. Allow 24 hours to cure.

3.6 INSTALLATION OF CHIMNEY SEAL

A. Execution

1. On the metal surfaces, prepare surface to a SSPC-SP10 or 11standard so that the preparation removes all loose mill scale, loose rust, loose paint, and other loose detrimental foreign matter by power wire brushing, power sanding, power grinding, power tool chipping, and power tool descaling.
    i. After preparation, clean with SSPC-SP1 "Solvent Cleaning" method to remove dust and debris.
    ii. Allow solvent or cleaner to dry out.
    iii. Apply one coat of epoxy primer.
        1. Primer shall be applied as directed on manufacturer published data sheets at 2-3 mils WTF.
        2. Allow primer to cure until it is tack-free. This time depends on conditions; blowing forced air will assist the cure time.
2. To prepare other substrates, refer to concrete preparation sections of this specification as described for cemetitious/brick/or mortar substrates. Should you have to prepare installed liner, solvent rub and wire brush to create scored abrasion prior to top coating with polymer elastomer**.**
3. Once the primer is tack-free, apply polymer elastomer as directed on manufacturer published data sheets at 125 mils (1/8") DFT for peak to valley.

3.7 QUALITY ASSURANCE AND ACCEPTANCE

A. Surface preparation inspection must take place prior to proceeding to material applications, this applies to both repair and lining applications.

1. Applicator must record, and submit to coating manufacturer's representative or designated inspector:
    i. pH level
    ii. Moisture content
    iii. Abrasive media type and/or preparation methods
    iv. ICRI conditions

B. During application, Applicator shall regularly perform and record epoxy coating thickness readings with a wet film thickness gage, such as those meeting ASTM D4414 - Standard Practice for Measurement of Wet Film Thickness of Organic Coatings by Notched Gages or other type of measuring probe or similar, to ensure uniform thickness during application

C. Applicator shall perform holiday detection on all surfaces coated with the epoxy coating in the presence of the coating manufacturer's representative or designated inspector. After the epoxy coating has set hard to the touch, surfaces shall first be dried, an induced holiday shall then be made on to the coated concrete surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays at that particular area. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE RPO188-99).
    1. All detected holidays shall be marked by the designated inspector and repaired. Additional epoxy coating material can be hand applied to the repair area. All touch-up/repair procedures shall follow the coating manufacturer's recommendations.

D. A final visual inspection shall be made by the Applicator and the coating manufacturer's representative or designated inspector. Any deficiencies in the finished coating shall be marked and repaired by Applicator according to the procedures set forth herein.

END OF SECTION

SECTION 02999
MISCELLANEOUS WORK AND CLEANUP

PART 1 GENERAL

1.1 SCOPE OF WORK

A. This section includes operations which cannot be specified in detail as separate items but can be sufficiently described as to the kind and extent of work involved. Furnish all labor, materials, equipment, and incidentals to complete the work under this section.

B. The work of this section includes, but is not limited to, the following:

1. Restoring of sidewalks, driveways curbing and gutters.
2. Crossing utilities.
3. Relocation of existing water lines, low pressure, gas lines, telephone lines, electric lines, cable TV lines and storm drains as necessary.
4. Restoring easements and Right-of-ways.
5. Cleaning up.
6. Incidental work.

1.2 WORK SPECIFICED UNDER OTHER SECTIONS

A. All work shall be completed in a workmanlike manner by competent workmen in full compliance with all applicable sections of these Specifications.

PART 2 PRODUCTS

2.1 MATERIALS

A. Materials required for this section shall be of at least the same type and quality as materials that are to be restored. Where possible, reuse existing materials that are removed and then replaced, except for paving.

PART 3 EXECUTION

3.1 RESTORING OF CURBING, FENCES AND GUARD RAILS

A. Existing curbing shall be protected. If necessary, curbing shall be removed from joint to joint and replaced after backfilling. Curbing which is damaged during construction shall be replaced with curbing of equal quality and dimension.

3.2 CROSSING UTILITIES

A. This item shall include any extra work required in crossing culverts, water courses, drains, water mains and other utilities, including all sheeting and bracing, extra excavation and backfill, or any other work required for the crossing.

3.3 RELOCATIONS OF EXISTING GAS LINES, TELEPHONE LINES, ELETRIC LINES, AND CABLE TV LINES

A. Notify the proper authority of the utility involved when relocation of these lines is required. Coordinate all work by the utility so that the progress of construction will not be hampered.

3.4 PROTECTION AND RESTORATION OF PROPERTY

A. During construction, take special care and provide adequate protection in order to minimize damage to vegetation, surface areas, and structures within the construction right-of-way, easement or site, and take full responsibility for the replacement or repair thereof. Immediately repair any damage to private property created by encroachment thereon. Should the removal or trimming of valuable trees, shrubs or grass be required to facilitate the installation within the designated construction area, this work shall be done in cooperation with the CITY, County and/or local communities which the work takes place. Said valuable vegetation, removed or damaged, shall be replanted, if possible, or replaced by items of equal quality and maintained until growth is reestablished. Topsoil damaged in the course of work shall be replaced in kind with suitable material, graded to match existing grade. Following construction completion, the work area along the route of the installation shall be finish grade two elevations compatible with the adjacent surface, with grassing or hand raking required within developed areas.

B. Existing lawn surfaces damage by Construction shall be re graded and re-sodded. These areas shall be maintained until all work under this contract has been completed and accepted.

3.5 CLEAN UP

A. Remove all construction material, excess excavation, buildings, equipment, and other debris remaining on the job as a result of construction operations and shall render the site of work in a neat and orderly condition.

B. Worksite cleanup shall follow construction operations without delay

3.6 INCIDENTAL WORK

A. Do all incidental work not otherwise specified, but obviously necessary for their proper completion of the contract as specified and as shown on the standard details.

END OF SECTION

ATTACHMENTS

TO: City of Fort Lauderdale
100 North Andrews, 4th Floor
Fort Lauderdale, FL 33301
Attn: XXXXX, Project Manager

FROM:
Contractor

Submittal No.:

☐ New Submittal ☐ Resubmittal

Project:

Project No.:

Specification Section No.:
(Cover only one section with each transmittal)

Schedule Date of Submittal:

SUBMITTAL TYPE: Shop Drawing ☐ Sample ☐ Informational ☐

The following items are hereby submitted:

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Spec. and Para. No.	Drawing or Brochure Number	Contains Variation to Contract	
				No	Yes

Contractor hereby certifies that (i) Contractor has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordancewith the Contract Documents and requirements of laws and regulations and governing agencies.

By:
Contractor (Authorized Signature)

[CONTRACTOR'S NAME]

[CONTRACTOR'S STREET ADDRESS]

[CONTRACTOR'S CITY, STATE AND ZIP]

[CONTRACTOR'S TELEPHONE NUMBER]

[CONTRACTOR'S FAX NUMBER]

MEMORANDUM

TO: **RESIDENTS OF [LOCATION OF CONSTRUCTION]**

DATE: **[CURRENT DATE]**

RE: **CONSTRUCTION IN YOUR AREA**

FROM: **[CONTRACTOR'S NAME]**

Construction in your area will commence on [date of construction commencement].The construction area is from [boundary #1] to [boundary #2].

Access to the area will be limited at certain times due to the construction activities. We apologize for any inconvenience and we will do our best to accommodate access to residents.

Thank You,

[Contractor Name]

CITY OF FORT LAUDERDALE

MANUFACTURER'S CERTIFICATE OF PROPER INSTALLATION

OWNER_____ EQPT SERIAL NO:_____

EQPT TAG NO:_____ EQPT/SYSTEM:_____

PROJECT NO:_____ SPEC. SECTION:_____

I hereby certify that the above-referenced equipment/system has been:(Check Applicable)

- ☐ Installed in accordance with Manufacturer's recommendations.Inspected,
- ☐ checked, and adjusted.
- ☐ Serviced with proper initial lubricants.
- ☐ Electrical and mechanical connections meet quality and safety standards.All
- ☐ applicable safety equipment has been properly installed.
- ☐ Functional tests.
- ☐ System has been performance tested, and meets or exceeds specified performance requirements. (When complete system of one manufacturer)

Note: Attach any performance test documentation from manufacturer.

Comments:_____

_____

_____

_____

_____

_____

I, the undersigned Manufacturer's Representative, hereby certify that I am (i) a duly authorized representative of the manufacturer, (ii) empowered by the manufacturer to inspect, approve, and operate his equipment and (iii) authorized to make recommendations required to assure that the equipment furnished by the manufacturer is complete and operational, except as may be otherwiseindicated herein. I further certify that all information contained herein is true and accurate.

Date:_____, 20___

Manufacturer:_____

By Manufacturer's Authorized Representative: _____
(Authorized Signature)

Contractor's Name & Address:

PERIODIC ESTIMATE FOR PARTIAL PAYMENT

OFFICE OF THE CITY ENGINEER
CITY OF FORT LAUDERDALE

City Proj./Imp.No.: _____ **Name of Project:** _____
FDOT Fin. Proj. No. _____

Periodic Est No.: _____ **Work Completed From:** _____ (Date) **To:** _____ (Date)

City Purchase Order No. _____

CONTRACT ITEMS						APPROVED CHANGE ORDER WORK				COST OF WORK COMPLETED TO DATE											
ORIGINAL CONTRACT ITEMS						CONTRACT ADJUSTMENTS				PREVIOUSLY BILLED			CURRENT BILLING PERIOD			WORK COMPLETED TO DATE			UNCOMPLETED WORK		
Item no.	Description of Item	Unit Qty.	Unit	Cost per unit.	Total cost of item.	C.O. #1		Adj. Qty.		Qty.	%	Cost	Qty.	%	Cost	Qty.	%	Cost	Qty.	%	Cost + / -
						Qty.	$	Qty.	$												
1					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
2					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
3					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
4					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
5					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
6					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
7					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
8					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
9					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
10					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
11					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
12					$0.00		$ -	0.00	$ -		0.00%	$ -		0.00%	$ -	-	0.00%	$ -	-	0.00%	$ -
	Subtotal Construction Costs (*Contract Items*):				**$0.00**		**$ -**		**$ -**		**0.00%**	**$0.00**		**0.00%**	**$0.00**		**0.00%**	**$ -**		**0.00%**	**$ -**

Additional Items by Change Order (if applicable)				C.O. #1		Adj. Qty.		PREVIOUSLY BILLED			CURRENT BILLING PERIOD			WORK COMPLETED TO DATE			UNCOMPLETED WORK		
Item No.	Description of Item	Cost per unit	Unit	Qty.	$	Qty.	$	Qty.	%	Cost	Qty.	%	Cost	Qty.	%	Cost	Qty.	%	Cost
					$ -	0	$ -		**0.00%**	$ -		0.00%	$ -	-	0.00%	$ -	0	0.00%	$ -
					$ -	0	$ -		**0.00%**	$ -		0.00%	$ -	-	0.00%	$ -	0	0.00%	$ -
	Subtotal Construction Costs (*Additional Items*):				**$ -**		**$ -**		**0.00%**	**$ -**		**0.00%**	**$ -**		**0.00%**	**$ -**			**$ -**
			TOTAL CONSTRUCTION COSTS:				**$ -**		**0.00%**	**$ -**		**0.00%**	**$ -**		**0.00%**	**$ -**			**$ -**

ADJUSTED CONTRACT TOTAL: **$0.00**
(ORIGINAL CONTRACT PLUS ALL APPROVED CHANGE ORDERS & UNCOMPLETED WORK)

2. CONTRACT COSTS - CREDIT AND PAYMENTS.

(a) Cost of contract items performed to date..... $ -

(b) Less amount retained in accordance with contract terms. (Show both percent and dollar amount)..... $ - (10%)

(c) Net amount earned on contract work to date..... $0.00

(d) Less amount of previous payments..... $ -

(e) Subtotal..... $ -

(f) Less Credit for: Liquid. Dmgs. [ ] Design [ ] 0

(g) **BALANCE DUE THIS PAYMENT**..... $ -

REV.01.PA 3/8/2021

TS-240

3. CERTIFICATION OF CONTRACTOR.
According to the best of my knowledge and belief, I certify that all items and amounts shown on the schedule of this Periodic Estimate for Partial Payment are correct; that all work has been performed and/or material supplied in full accordance with the requirements of the referenced project or improvement number, and/or duly authorized deviations, substitutions, alterations, and/or additions; that the foregoing is a true and correct statement of the contract account up to and including the last day of the period covered by this Periodic Estimate.

If Periodic Estimate is for a final payment to project or improvement, I further certify that ALL persons doing work upon or furnishing materials or supplies for this project for improvements under this foregoing contract have been paid in full, and that all taxes imposed by No. 212 Florida Statutes, (Sales and Use Tax Act, as Amended) have been paid and discharged.

The balance due this payment is full payment for all extra work and materials furnished by the undersigned and all incidentals thereto and the undersigned hereby releases the City of Fort Lauderdale from all claims whatsoever arising out of this contract for the work performed up to date of this requisition.

The authorization and execution of this Periodic Estimate for Partial Payment by the City does not waive, nor does the City surrender any of its rights as afforded by the contract.

Final payment application? (Yes / No): NO
If yes, have DBE requirements been met? (Yes / No / n/a): N/A

Contractor's Company Name

Signature of Authorized Representative and **Date** of Signature

Typed or Written **Name** of Representative and **Job Title**

4. CONSULTING ARCHITECT or CONSULTING ENGINEER PAYMENT AUTHORIZATION (where applicable). This authorization is subject to the terms of the contract, including, but not limited to, Sections 5-37 through 5-44.

Signed: N/A
Consulting Engineer (if required) (Date)

5. CITY ENGINEERING PARTIAL PAYMENT AUTHORIZATION. This authorization is subject to the terms of the contract, including, but not limited to, Sections 5-37 thru 5-44.

Project Manager II (select name) (Date)

Senior Project Manager (select name) (Date)

Engineering Inspector (if required) (Date)

Omar Castellon, P.E., Assistant City Engineer (Date)

CONTRACTOR'S CONDITIONAL WAIVER AND RELEASE OF LIEN UPON PROGRESS PAYMENT

F.S. Ch. 713.20

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned furnished services, labor, materials or supplies in connection with the public work tothe City of Fort Lauderdale for the job identified and legally described as _____, through the date_____, Payment Application No._____dated_____, in the progress amount of_____, and does hereby release and satisfy all liens, lien rights, claims or demands of any kind whatsoever which the undersigned now has or might have against the City ofFort Lauderdale in connection with the above described public work.

This document is effective only upon the undersigned's receipt of payment from the City of Fort Lauderdalein the progress amount stated above.

Witnesses

1. _____

2._____

Exact Name of Contractor

_____

BY: _____

_____
(Print Name & Title)

STATE OF: _____

COUNTY OF: _____

IN WITNESS WHEREOF, this foregoing instrument was executed before me in the name of the undersigned and under its seal by its proper officers, this_____day of_____, 20_____.

_____
(Notary Public Signature)

(Notary Seal)

Sub-Contractor's Conditional Waiver and Release of Lien Upon Progress Payment

F.S. Ch. 713.20

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, furnished services, labor, materials, supplies, equipment and/or rental of equipment,in connection with the public work to the City of Fort Lauderdale for the job identified and described as

_____

_____

through the date_____, in which _____ is General Contractor, and does hereby release and satisfy all liens, lien rights, claims or demands of any kind whatsoever which the undersigned now has or might have against the City of Fort Lauderdale with the above described public work.

This document is effective only upon the undersigned's receipt of progress payment from the General Contractor.

Witnesses

1. _____

2._____

Exact Name of Subcontractor

_____

BY: _____

_____
(Print Name & Title)

STATE OF: _____

COUNTY OF: _____

IN WITNESS WHEREOF, this foregoing instrument was executed before me in the name of the undersigned and under its seal by its proper officers, this_____day of_____, 20_____.

_____
(Notary Public Signature)

(Notary Seal)

CONTRACTOR'S CONDITIONAL WAIVER AND RELEASE OF LIEN UPON FINAL PAYMENT

F.S. Ch. 713.20

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, under contract no._____with the City of Fort Lauderdale dated _____, furnished services, labor, materials, supplies equipment and/or rental of equipment, in connection with the public work for the job identified and described as _____, through the date_____, in the full contract amount of $_____, as modified by change orders, addenda, etc., and does hereby release and satisfy all liens, lien rights, claims or demands of any kind whatsoever which the undersigned now has or might have against the City of Fort Lauderdale in connection with the above described public work. That an affidavit on behalf of the contractor, signed by_____, has been furnished to the City of Fort Lauderdale, as well as waivers and releases of lien executed by all materialmen and subcontractors regardless of their tier.

This document is effective only upon the undersigned's receipt of final payment from the City of Fort Lauderdale in the full contract amount stated above for the public work described above.

Witnesses

1. _____

2._____

Exact Name of Contractor

_____

BY: _____

_____
(Print Name & Title)

STATE OF: _____

COUNTY OF: _____

IN WITNESS WHEREOF, this foregoing instrument was executed before me in the name of the undersigned and under its seal by its proper officers, this_____day of_____, 20_____.

_____
(Notary Public Signature)

(Notary Seal)

Sub-Contractor's Conditional Waiver and Release of Lien Upon Final Payment

F.S. Ch. 713.20

KNOW ALL MEN BY THESE PRESENTS:

That the undersigned, furnished services, labor, materials, supplies, equipment and/or rental of equipment,in connection with the public work to the City of Fort Lauderdale for the job identified and described as

_____

_____

through the date_____, in which _____ is General Contractor, and does hereby release and satisfy all liens, lien rights, claims or demands of any kind whatsoever which the undersigned now has or might have against the City of Fort Lauderdale or General Contractor with the above described public work.

This document is effective only upon the undersigned's receipt of final payment from of the General Contractor for the above described public work.

Witnesses

1. _____

2._____

Exact Name of Subcontractor

_____

BY: _____

_____
(Print Name & Title)

STATE OF: _____

COUNTY OF: _____

IN WITNESS WHEREOF, this foregoing instrument was executed before me in the name of the undersigned and under its seal by its proper officers, this_____day of_____, 20_____.

_____
(Notary Public Signature)

(Notary Seal)

AFFIDAVIT ON BEHALF OF CONTRACTOR

STATE OF_____:

COUNTY OF_____:

The undersigned, first being duly sworn, deposed and says on oath as follows:

(1) That_____ is contractor in a certain contract with City of Fort Lauderdale, dated_____, 20 , in conjunction with the following public work: _____

_____

_____

_____

(2) That affiant is_____of the above-named contractor.
(President, Vice President, Sole Proprietor or Partner)

(3) That the work contracted to be performed has been performed and completed in accordancewith the plans and specifications, addenda, change orders and contract documents, such work having been completed on _____.

(4) That all persons who furnished labor, supplies or materials or did work in connection with such improvements set out in the contract have been paid in full, including all subcontractors

(5) This affidavit is made for the purpose of obtaining final payment by the contractor from the Cityof Fort Lauderdale.

_____

Sworn to and subscribed before me,
This the_____day of_____,
20___, A.D.

_____
Notary Public

(SEAL)

My Commission expires:

_____

SUBCONTRACTOR IDENTIFICATION FORM

This form shall be completed by all City of Fort Lauderdale prime Contractors or Consultants who subcontract out any portion of his/her City contract/agreement. The form shall be forwarded to the City of Fort Lauderdale's Public Services Department (Engineering and Architectural Services) with the prime Contractor's/Consultant's final pay request. A separate form is to be completed and submitted for each subcontractor. Please telephone (954) 828-5057 or 828-5083 if you have any questions regarding this form.

1) CITY OF FORT LAUDERDALE PROJECT NUMBER. _____

2) PROJECT DESCRIPTION_____

3) SUBCONTRACTOR_____
Business Name Address Telephone No.

4) SUBCONTRACTOR'S PRINCIPAL OFFICER_____

5) CLASSIFICATION OF WORK SUBCONTRACTED OUT_____

6) COST OF WORK SUBCONTRACTED OUT_____

7) Please check the item(s), which properly identify the ownership status of the subcontractor's firm.( )

Subcontractor firm is not a MBE or WBE.

( ) Subcontractor firm is MBE, as at least 51 percent is owned and operated by one or more socially and economically-disadvantaged individuals.

_____ American Indian_____Asian_____Black_____Hispanic_____White

( ) Subcontractor firm is a WBE, as at least 51 percent if owned and operated by one or more women.
_____ American Indian_____Asian_____Black_____Hispanic_____White

8) PRIME CONTRACTOR

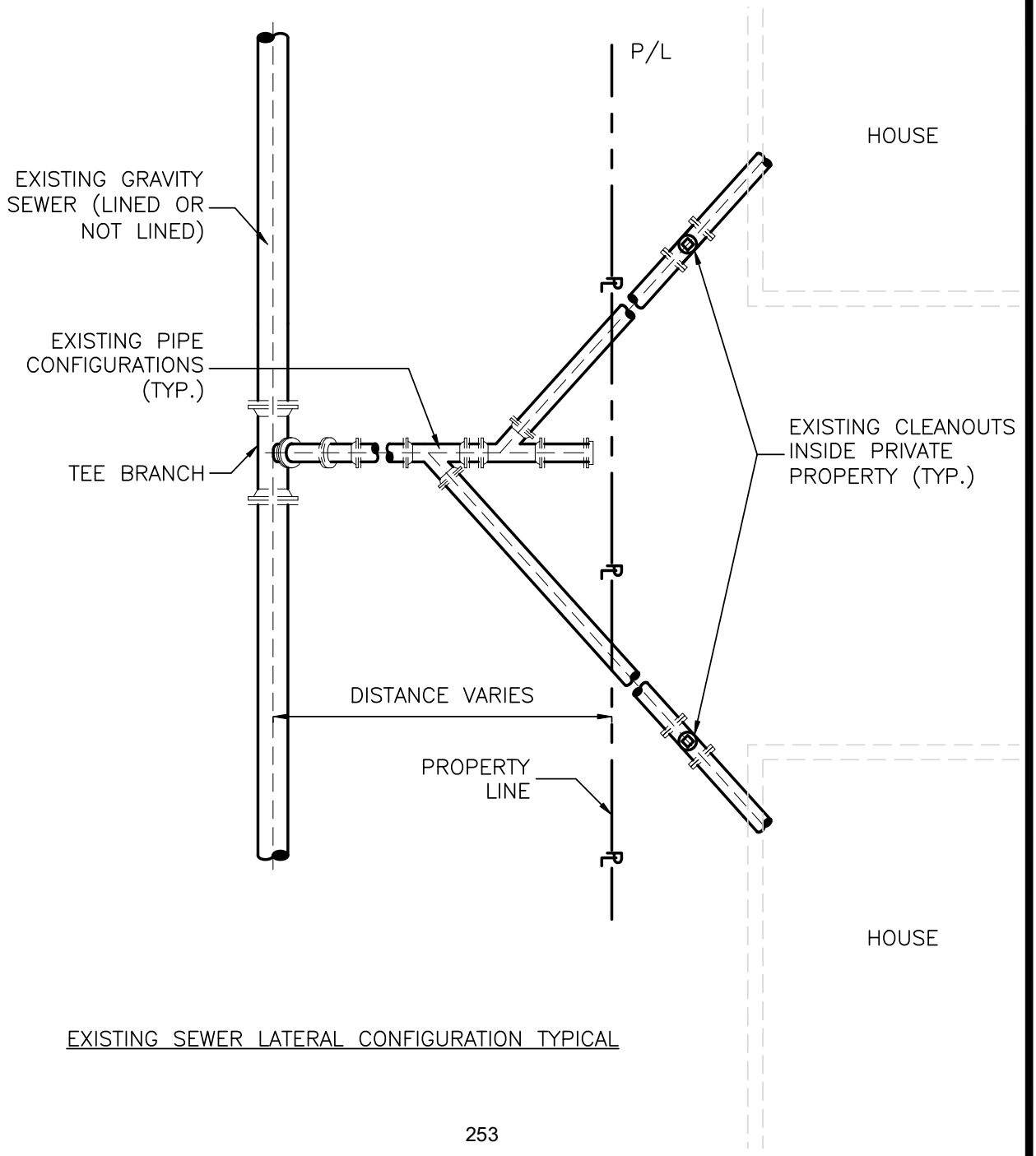
_____ _____
NAME & TITLE OF PRIME CONTRACTOR'S REPRESENTATIVE COMPLETING THIS FORM (Please Print) TELEPHONE NO.

SIGNATURE_____ DATE_____
PRIME CONTRACTOR'S REPRESENTATIVE

SubConIDForm/mb
Rev. 02/03

CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER



EXISTING SEWER LATERAL CONFIGURATION TYPICAL

253

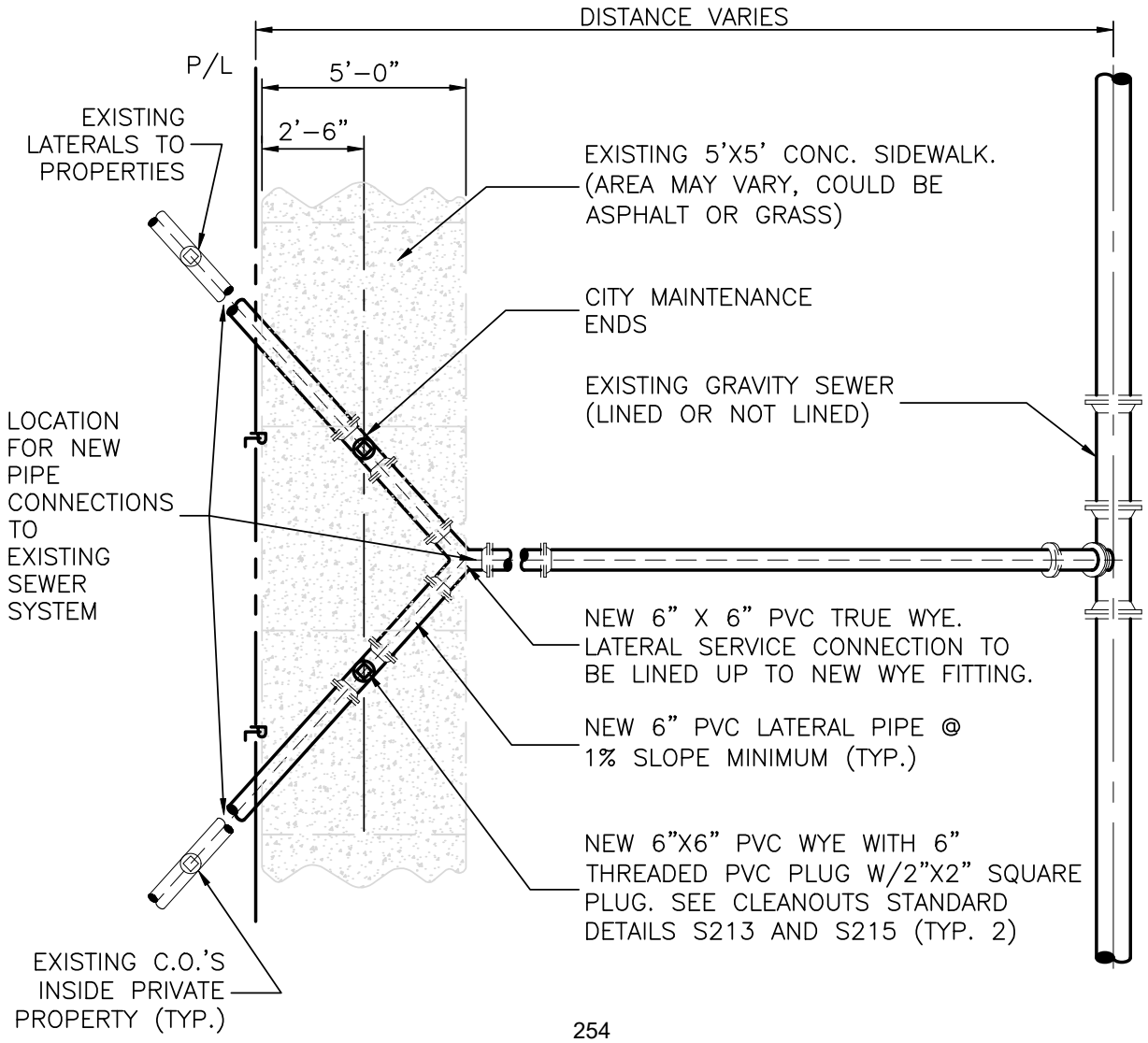
DATE: Sep–18	SCALE: 1/4"=1'–0"	EXISTING WASTEWATER DOUBLE SERVICE CONNECTION TYPICAL	S 216
REVISED: Sep–18	DRAWN BY: B.H.		

CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

NOTES:

1. REPAIRS TO BE DONE BASED ON PRE-EXISTING TYPE OF FIELD CONDITIONS.
2. REFERENCE STD. DETAILS FOR C.O. INSTALLATIONS. (S213, S214, & S215)



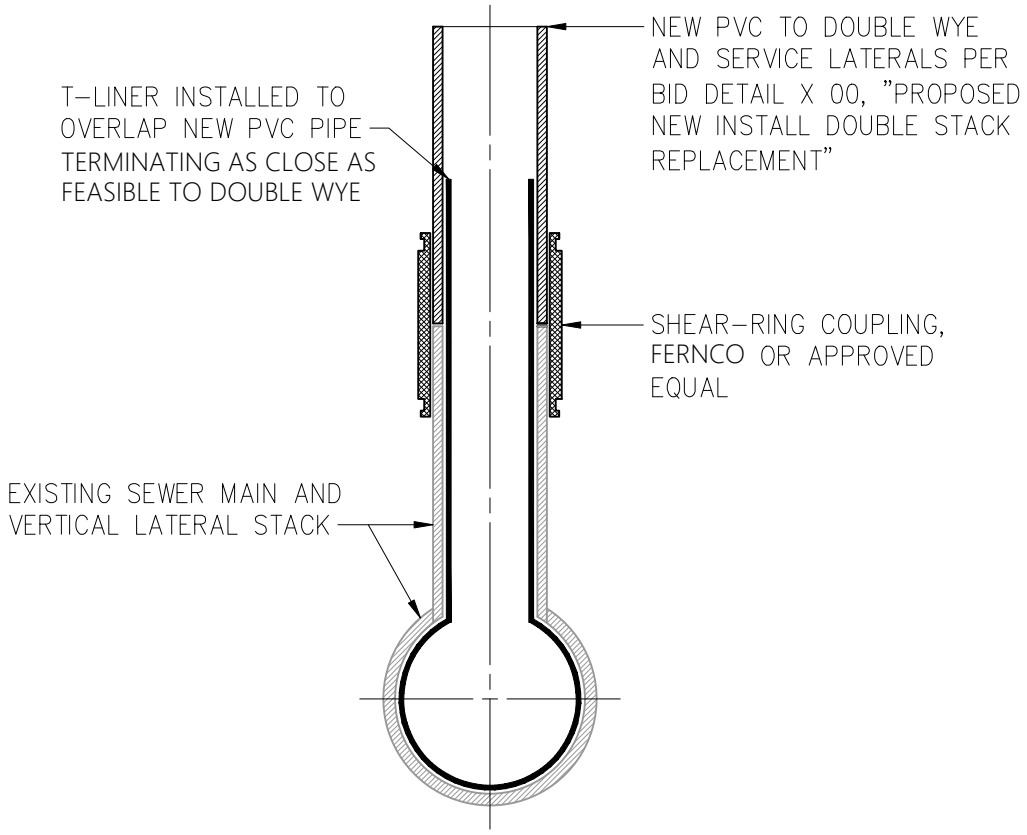
254

NEW SEWER LATERAL CONFIGURATION

DATE: Sep-18	SCALE: 1/4"=1'-0"	WASTEWATER DOUBLE SERVICE CONNECTION	S 217
REVISED: Sep-18	DRAWN BY: B.H.		

CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

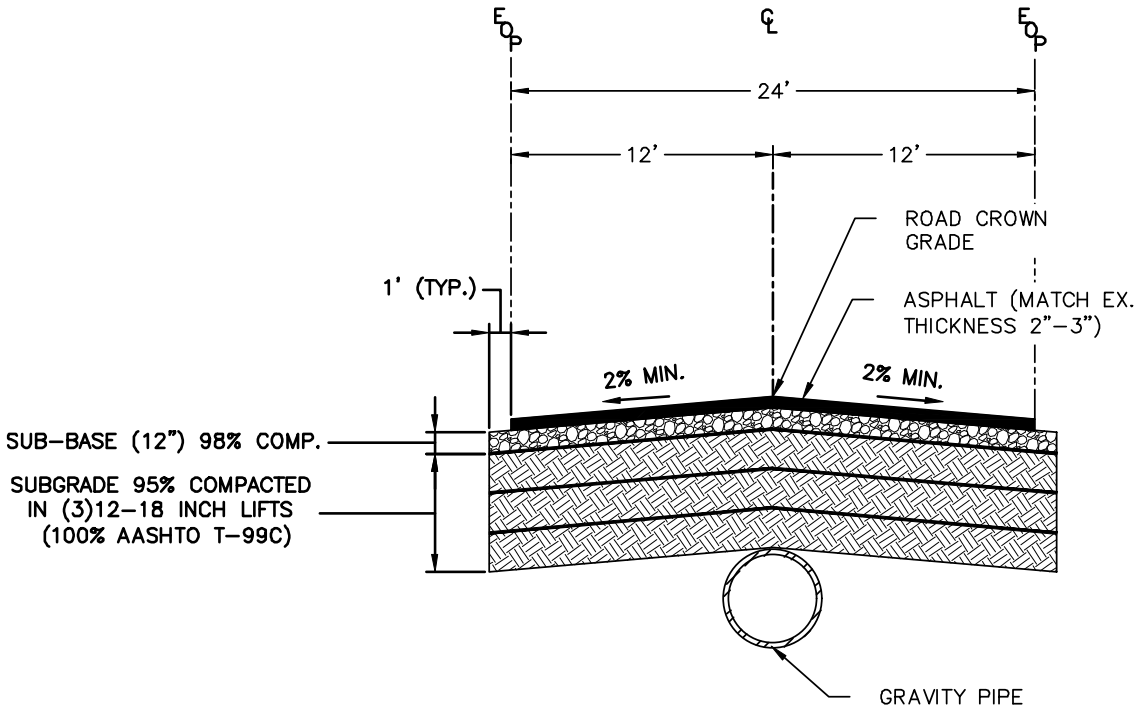


255

DATE: Aug-20	SCALE: 1 1/2"=1'	STACK REHABILITATION DETAIL	S 218
REVISED: Aug-20	DRAWN BY: H.S.		

CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

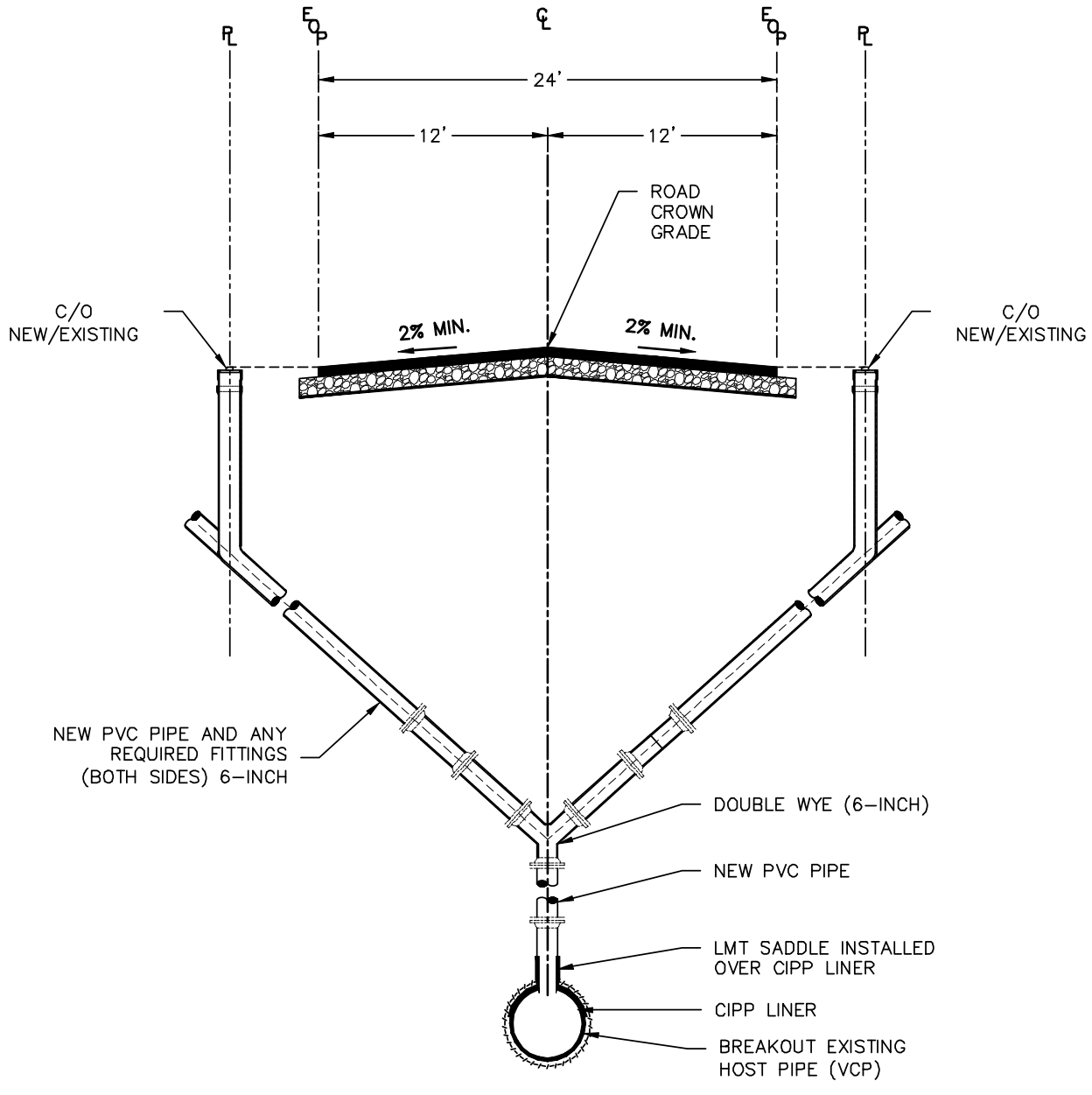


256

DATE: February 19 REVISED:	SCALE: N.T.S. DRAWN BY:	RESTORATION DOUBLE STACK REPLACEMENT	X 00

CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER

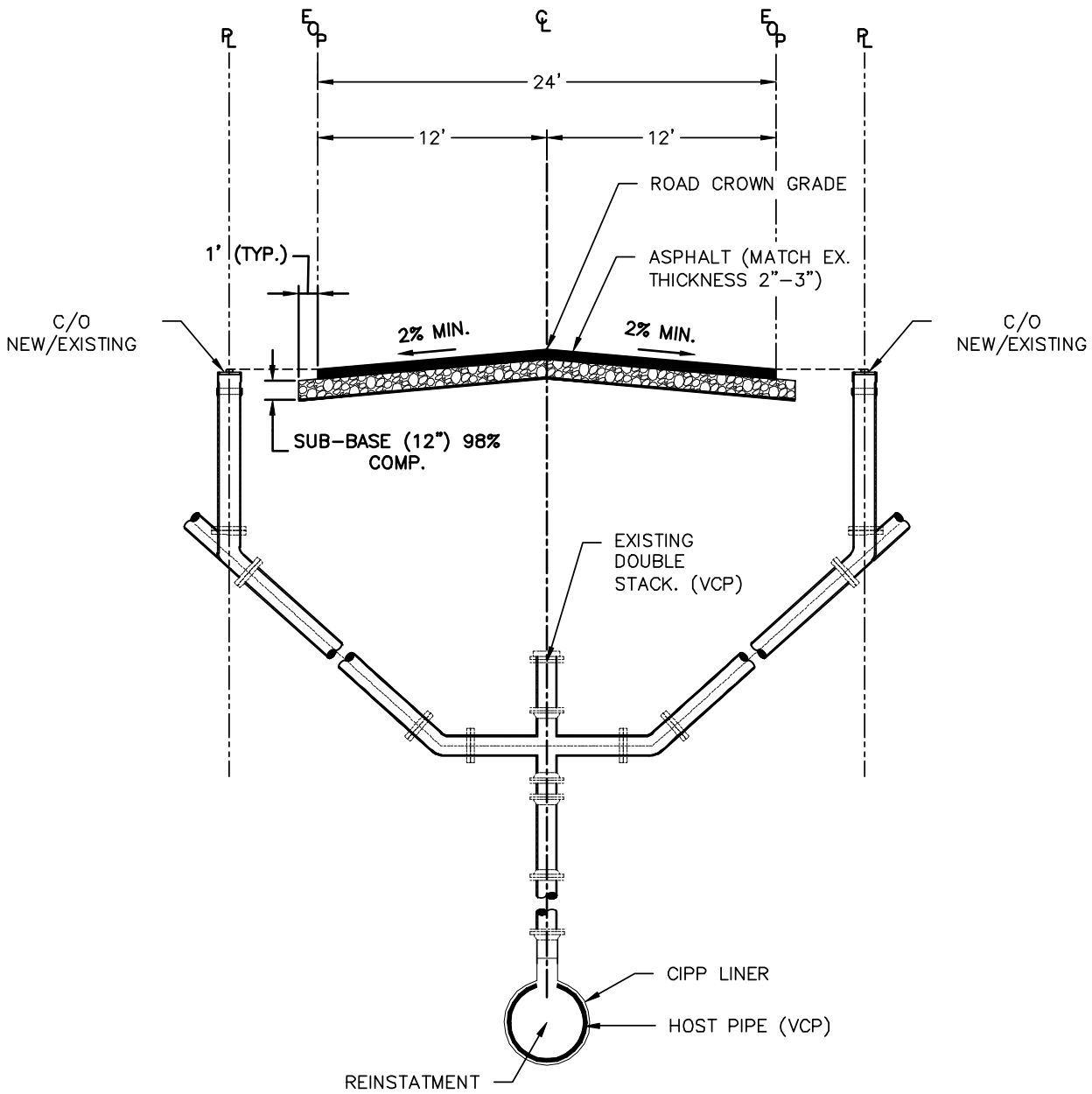


257

DATE: February 19	SCALE: N.T.S.	PROPOSED NEW INSTALL	X
REVISED:	DRAWN BY:	DOUBLE STACK REPLACEMENT	00

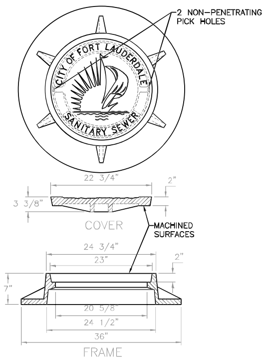
CITY OF FORT LAUDERDALE

OFFICE OF THE CITY ENGINEER



258

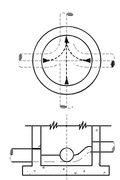
DATE: February 19 REVISED:	SCALE: N.T.S. DRAWN BY:	EXISTING CONDITIONS DOUBLE STACK REPLACEMENT	X 00



NOTES:

1. MATERIAL: FRAME AND COVER AS SPECIFIED.
2. ADDITIONAL GRADE RINGS MAY BE USED TO ELEVATE EXISTING MANHOLE FRAMES TO RESURFACED GRADE (MAX. 4" HEIGHT).
3. ALL DIMENSIONS ARE NOMINAL.
4. OPTIONAL: HINGED FRAME AND COVER AS SPECIFIED.

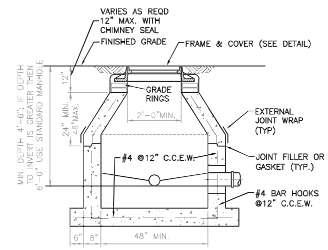
(200) MANHOLE FRAME & COVER PAVED AREAS
N.T.S.



NOTE:

1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE TREATED AS MAINS. (ELEVATIONS SHOWN, PRECAST HOLE, FLOW CHANNEL)
4. BRICK RUBBLE PERMITTED AS FLOW CHANNEL BUILDUP.
5. SIDEWALLS OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. NO INSIDE DROP LARGER THAN 6" SHALL BE ALLOWED WITH 3 OR 4 INVERTS AND MANHOLES WITH A CHANGE OF DIRECTION OF FLOW OF MORE THAN 45 DEGREES.

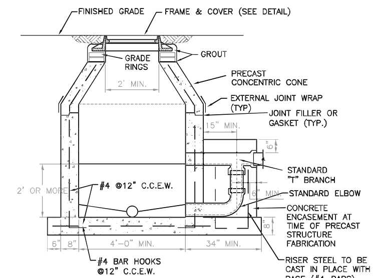
(202) INVERT FLOW CHANNELS
N.T.S.



NOTE:

ALL STANDARD MANHOLE NOTES AND DETAILS ARE APPLICABLE

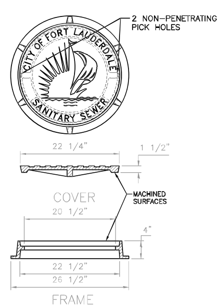
(204) SHALLOW MANHOLE
N.T.S.



NOTES:

1. ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.0 FOOT DROP.
3. SOLVENT TYPE JOINT PVC FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY.
4. THE PRECAST BASE SHALL EXTEND FULLY UNDER THE DROP ASSEMBLY AND BE CONSTRUCTED MONOLITHICALLY WITH THE BASE SECTION.
5. BRICK AND CONCRETE RUBBLE ARE PERMITTED AS FILLER IN DROP ENCASEMENT.

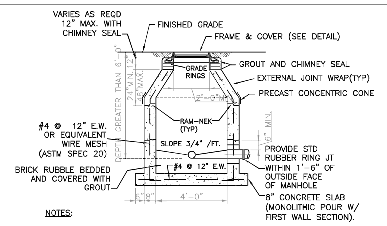
(206) OUTSIDE DROP CONNECTION PRECAST MANHOLE - TYPE B
N.T.S.



NOTES:

1. MATERIAL: FRAME AND COVER AS SPECIFIED.
2. ADDITIONAL GRADE RINGS MAY BE USED TO ELEVATE EXISTING MANHOLE FRAMES TO RESURFACED GRADE (MAX. 4" HEIGHT).
3. ALL DIMENSIONS ARE NOMINAL.
4. OPTIONAL: HINGED FRAME AND COVER AS SPECIFIED.

(201) MANHOLE FRAME & COVER UNPAVED AREAS
N.T.S.



NOTES:

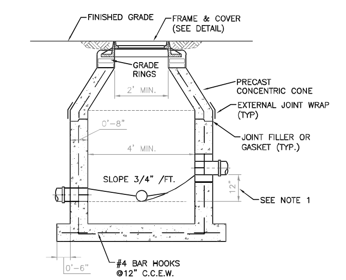
1. PRECAST CONCRETE TYPE II 4000 P.S.I.
2. "RAM-NEK" OR EQUAL AT ALL RISER JOINTS (1/2" THICK WITH THE WIDTH AT LEAST 1/2 THE WALL THICKNESS).
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. FLOW CHANNELS SHALL BE CONSTRUCTED TO DIRECT INFLUENT INTO FLOW STREAM. (SEE DETAIL)
5. LIFT HOLES ARE PERMITTED.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE DRILLED.

   A. FOR PVC PIPE ENTERING MANHOLE WITH PRECAST HOLES USE THE APPROVED NON-ASBESTOS PVC-MANHOLE ADAPTER OR PRECAST FLEXIBLE MANHOLE SLEEVE FOR THE APPROPRIATE PIPE DIAMETER AND DIMENSION RATIO. THE ADAPTER SHALL NOT EXTEND MORE THAN 1" INTO THE MANHOLE. DOUBLE BANDING IS REQUIRED FOR FLEXIBLE MANHOLE SLEEVE.

   B. CONNECTION TO A MANHOLE WITH A CORE DRILLED HOLE SHALL BE MADE USING A 5' MIN. DUCTILE IRON PIPE SECTION (EPOXY LINED) OR THE APPROVED PVC-MANHOLE ADAPTER.

7. INSIDE DROPS SHALL NOT BE DESIGNED TO EXCEED 1.80 FEET AND NOT CONSTRUCTED TO EXCEED 2.0 FEET. MAX. 6" INSIDE DROP IS PERMITTED FOR MANHOLES WITH 3 OR MORE INVERTS AND MANHOLES WITH A CHANGE IN FLOW DIRECTION OF MORE THAN 45 DEGREES.
8. MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH ASTM C-478, LATEST STANDARD.
9. MINIMUM 5 FEET IS REQUIRED BETWEEN OUTSIDE OF MANHOLE AND SERVICE WYE.
10. MANHOLES TO BE PAINTED INSIDE AND OUTSIDE WITH 2 COATS OF AN APPROVED PROTECTIVE COATING. (ONE COAT RED, ONE COAT BLACK) MIN. 8-10 MILS D.F.T. PER COAT.
11. MANHOLE SHALL BE SET PLUMB TO LINE AND GRADE.

(203) STANDARD MANHOLE
N.T.S.

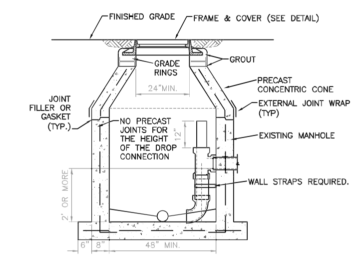


NOTES:

1. INSIDE DROP TO BE USED WHEN DROP IS GREATER THAN 6 INCHES AND LESS THAN 24 INCHES AND/OR FOR LATERAL CONNECTIONS.
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED SLAB TO EXTEND UNDER THE DROP CONNECTION.
4. MINIMUM PIPE SIZE FOR DROP IS 8".
5. SEE "STANDARD MANHOLE" DETAIL FOR ADDITIONAL REQUIREMENTS.

(205) DROP CONNECTION PRECAST MANHOLE - TYPE A
N.T.S.

259



NOTES:

1. ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. INSIDE DROP CONNECTION TO BE USED ONLY FOR A SINGLE DROP CONNECTION TO AN EXISTING MANHOLE.
3. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.0 FOOT DROP.
4. SOLVENT TYPE JOINT PVC FITTINGS TO BE UTILIZED IN THE DROP ASSEMBLY ONLY.

(207) INSIDE DROP CONNECTION EXISTING MANHOLE - TYPE C
N.T.S.

NOT FOR CONSTRUCTION OR BID

ENGINEER:	DRAWN BY: CWB	DATE: 09/17/2018
#Name REG. No: #NO. DATE: #DATE	DESIGNED BY:	SCALE:
TEL: #Tel FAX: #Fax	CHECKED BY:	FIELD BOOK:

CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

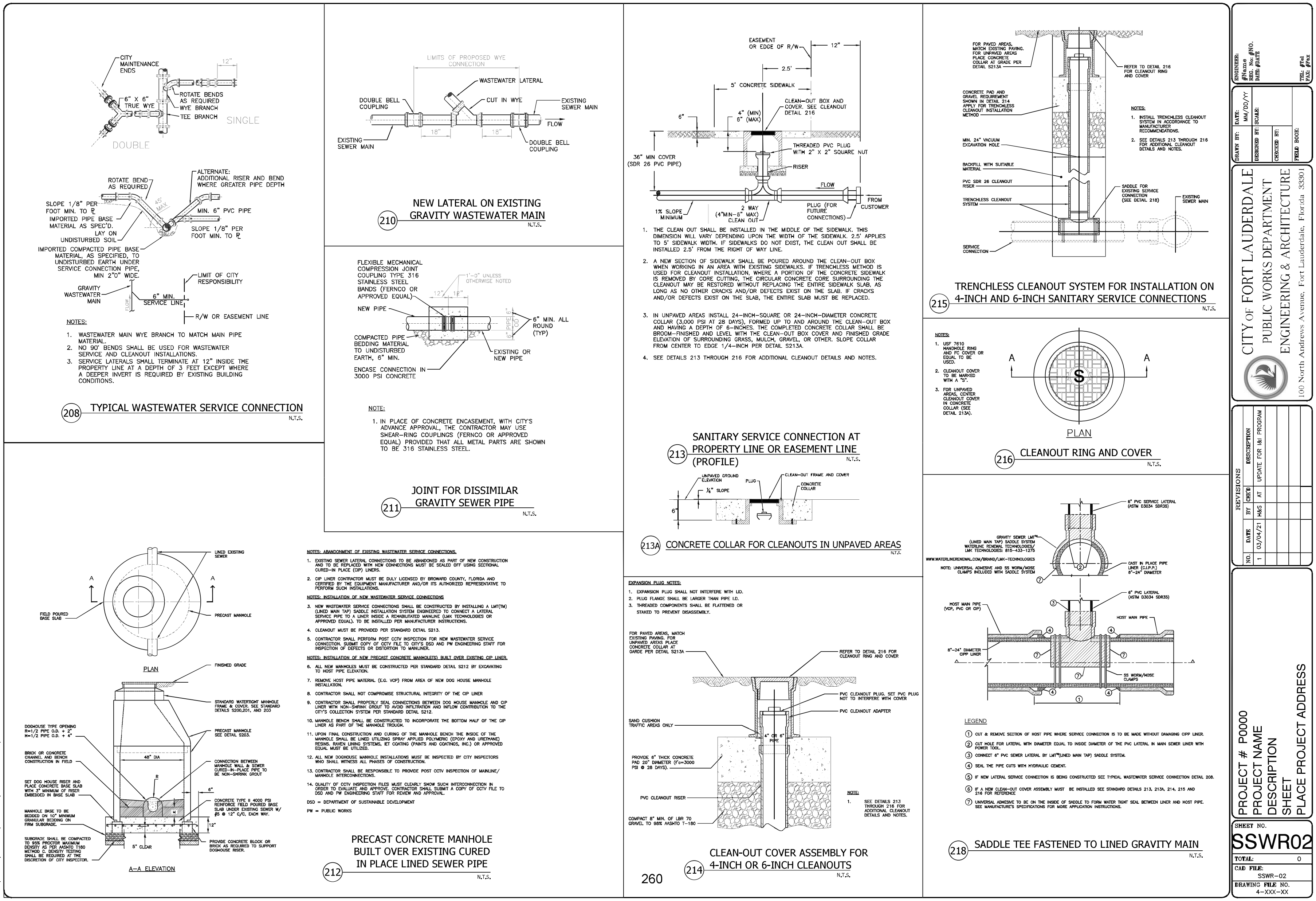
REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION

PROJECT # P0000
PROJECT NAME
DESCRIPTION
SHEET
PLACE PROJECT ADDRESS

SHEET NO. SSWR01
TOTAL: 0
CAD FILE: DRAWING2
DRAWING FILE NO. 4-XXX-XX

DRAWING2.DWG


CITY MAINTENANCE ENDS
6" X 6" TRUE WYE
ROTATE BENDS AS REQUIRED
WYE BRANCH
TEE BRANCH
SINGLE
DOUBLE
ROTATE BEND AS REQUIRED
ALTERNATE: ADDITIONAL RISER AND BEND WHERE GREATER PIPE DEPTH
SLOPE 1/8" PER FOOT MIN. TO ℄
IMPORTED PIPE BASE MATERIAL AS SPEC'D.
LAY ON UNDISTURBED SOIL
MIN. 6" PVC PIPE
SLOPE 1/8" PER FOOT MIN. TO ℄
IMPORTED COMPACTED PIPE BASE MATERIAL, AS SPECIFIED, TO UNDISTURBED EARTH UNDER SERVICE CONNECTION PIPE, MIN 2'0" WIDE.
LIMIT OF CITY RESPONSIBILITY
GRAVITY WASTEWATER MAIN
6" MIN. SERVICE LINE
R/W OR EASEMENT LINE
NOTES:
1. WASTEWATER MAIN WYE BRANCH TO MATCH MAIN PIPE MATERIAL.
2. NO 90° BENDS SHALL BE USED FOR WASTEWATER SERVICE AND CLEANOUT INSTALLATIONS.
3. SERVICE LATERALS SHALL TERMINATE AT 12" INSIDE THE PROPERTY LINE AT A DEPTH OF 3 FEET EXCEPT WHERE A DEEPER INVERT IS REQUIRED BY EXISTING BUILDING CONDITIONS.
208 TYPICAL WASTEWATER SERVICE CONNECTION
N.T.S.
LIMITS OF PROPOSED WYE CONNECTION
WASTEWATER LATERAL
DOUBLE BELL COUPLING
CUT IN WYE
EXISTING SEWER MAIN
FLOW
EXISTING SEWER MAIN
DOUBLE BELL COUPLING
210 NEW LATERAL ON EXISTING GRAVITY WASTEWATER MAIN
N.T.S.
FLEXIBLE MECHANICAL COMPRESSION JOINT COUPLING TYPE 316 STAINLESS STEEL BANDS (FERNCO OR APPROVED EQUAL)
1'-0" UNLESS OTHERWISE NOTED
NEW PIPE
6" MIN. ALL ROUND (TYP)
COMPACTED PIPE BEDDING MATERIAL TO UNDISTURBED EARTH, 6" MIN.
EXISTING OR NEW PIPE
ENCASE CONNECTION IN 3000 PSI CONCRETE
NOTE:
1. IN PLACE OF CONCRETE ENCASEMENT, WITH CITY'S ADVANCE APPROVAL, THE CONTRACTOR MAY USE SHEAR-RING COUPLINGS (FERNCO OR APPROVED EQUAL) PROVIDED THAT ALL METAL PARTS ARE SHOWN TO BE 316 STAINLESS STEEL.
211 JOINT FOR DISSIMILAR GRAVITY SEWER PIPE
N.T.S.
EASEMENT OR EDGE OF R/W
12"
2.5'
5' CONCRETE SIDEWALK
6"
4" (MIN) 6" (MAX)
CLEAN-OUT BOX AND COVER. SEE CLEANOUT DETAIL 216
36" MIN COVER (SDR 26 PVC PIPE)
THREADED PVC PLUG WITH 2" X 2" SQUARE NUT
RISER
FLOW
1% SLOPE MINIMUM
2 WAY (4"MIN-6" MAX) CLEAN OUT
PLUG (FOR FUTURE CONNECTIONS)
FROM CUSTOMER
1. THE CLEAN OUT SHALL BE INSTALLED IN THE MIDDLE OF THE SIDEWALK. THIS DIMENSION WILL VARY DEPENDING UPON THE WIDTH OF THE SIDEWALK. 2.5' APPLIES TO 5' SIDEWALK WIDTH. IF SIDEWALKS DO NOT EXIST, THE CLEAN OUT SHALL BE INSTALLED 2.5' FROM THE RIGHT OF WAY LINE.
2. A NEW SECTION OF SIDEWALK SHALL BE POURED AROUND THE CLEAN-OUT BOX WHEN WORKING IN AN AREA WITH EXISTING SIDEWALKS. IF TRENCHLESS METHOD IS USED FOR CLEANOUT INSTALLATION, WHERE A PORTION OF THE CONCRETE SIDEWALK IS REMOVED BY CORE CUTTING, THE CIRCULAR CONCRETE CORE SURROUNDING THE CLEANOUT MAY BE RESTORED WITHOUT REPLACING THE ENTIRE SIDEWALK SLAB, AS LONG AS NO OTHER CRACKS AND/OR DEFECTS EXIST ON THE SLAB. IF CRACKS AND/OR DEFECTS EXIST ON THE SLAB, THE ENTIRE SLAB MUST BE REPLACED.
3. IN UNPAVED AREAS INSTALL 24-INCH-SQUARE OR 24-INCH-DIAMETER CONCRETE COLLAR (3,000 PSI AT 28 DAYS), FORMED UP TO AND AROUND THE CLEAN-OUT BOX AND HAVING A DEPTH OF 6-INCHES. THE COMPLETED CONCRETE COLLAR SHALL BE BROOM-FINISHED AND LEVEL WITH THE CLEAN-OUT BOX COVER AND FINISHED GRADE ELEVATION OF SURROUNDING GRASS, MULCH, GRAVEL, OR OTHER. SLOPE COLLAR FROM CENTER TO EDGE 1/4-INCH PER DETAIL S213A.
4. SEE DETAILS 213 THROUGH 216 FOR ADDITIONAL CLEANOUT DETAILS AND NOTES.
213 SANITARY SERVICE CONNECTION AT PROPERTY LINE OR EASEMENT LINE (PROFILE)
N.T.S.
213A CONCRETE COLLAR FOR CLEANOUTS IN UNPAVED AREAS
N.T.S.
TRENCHLESS CLEANOUT SYSTEM
SADDLE FOR EXISTING SERVICE CONNECTION (SEE DETAIL 218)
EXISTING SEWER MAIN
SERVICE CONNECTION
NOTES:
1. INSTALL TRENCHLESS CLEANOUT SYSTEM IN ACCORDANCE TO MANUFACTURER RECOMMENDATIONS.
2. SEE DETAILS 213 THROUGH 216 FOR ADDITIONAL CLEANOUT DETAILS AND NOTES.
215 TRENCHLESS CLEANOUT SYSTEM FOR INSTALLATION ON 4-INCH AND 6-INCH SANITARY SERVICE CONNECTIONS
N.T.S.
NOTES:
1. USF 7610 MANHOLE RING AND FC COVER OR EQUAL TO BE USED.
2. CLEANOUT COVER TO BE MARKED WITH A "S".
3. FOR UNPAVED AREAS, CENTER CLEANOUT COVER IN CONCRETE COLLAR (SEE DETAIL 213A).
PLAN
216 CLEANOUT RING AND COVER
N.T.S.
NOTES: ABANDONMENT OF EXISTING WASTEWATER SERVICE CONNECTIONS.
1. EXISTING SEWER LATERAL CONNECTIONS TO BE ABANDONED AS PART OF NEW CONSTRUCTION AND TO BE REPLACED WITH NEW CONNECTIONS MUST BE SEALED OFF USING SECTIONAL CURED-IN PLACE (CIP) LINERS.
2. CIP LINER CONTRACTOR MUST BE DULY LICENSED BY BROWARD COUNTY, FLORIDA AND CERTIFIED BY THE EQUIPMENT MANUFACTURER AND/OR ITS AUTHORIZED REPRESENTATIVE TO PERFORM SUCH INSTALLATIONS.
NOTES: INSTALLATION OF NEW WASTEWATER SERVICE CONNECTIONS
3. NEW WASTEWATER SERVICE CONNECTIONS SHALL BE CONSTRUCTED BY INSTALLING A LMT(TM) (LINED MAIN TAP) SADDLE INSTALLATION SYSTEM ENGINEERED TO CONNECT A LATERAL SERVICE PIPE TO A LINER INSIDE A REHABILITATED MAINLINE (LMK TECHNOLOGIES OR APPROVED EQUAL). TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
4. CLEANOUT MUST BE PROVIDED PER STANDARD DETAIL S213.
5. CONTRACTOR SHALL PERFORM POST CCTV INSPECTION FOR NEW WASTEWATER SERVICE CONNECTION. SUBMIT COPY OF CCTV FILE TO CITY'S DSD AND PW ENGINEERING STAFF FOR INSPECTION OF DEFECTS OR DISTORTION TO MAINLINER.
NOTES: INSTALLATION OF NEW PRECAST CONCRETE MANHOLE(S) BUILT OVER EXISTING CIP LINER.
6. ALL NEW MANHOLES MUST BE CONSTRUCTED PER STANDARD DETAIL S212 BY EXCAVATING TO HOST PIPE ELEVATION.
7. REMOVE HOST PIPE MATERIAL (E.G. VCP) FROM AREA OF NEW DOG HOUSE MANHOLE INSTALLATION.
8. CONTRACTOR SHALL NOT COMPROMISE STRUCTURAL INTEGRITY OF THE CIP LINER
9. CONTRACTOR SHALL PROPERLY SEAL CONNECTIONS BETWEEN DOG HOUSE MANHOLE AND CIP LINER WITH NON-SHRINK GROUT TO AVOID INFILTRATION AND INFLOW CONTRIBUTION TO THE CITY'S COLLECTION SYSTEM PER STANDARD DETAIL S212.
10. MANHOLE BENCH SHALL BE CONSTRUCTED TO INCORPORATE THE BOTTOM HALF OF THE CIP LINER AS PART OF THE MANHOLE TROUGH.
11. UPON FINAL CONSTRUCTION AND CURING OF THE MANHOLE BENCH THE INSIDE OF THE MANHOLE SHALL BE LINED UTILIZING SPRAY APPLIED POLYMERIC (EPOXY AND URETHANE) RESINS. RAVEN LINING SYSTEMS, IET COATING (PAINTS AND COATINGS, INC.) OR APPROVED EQUAL MUST BE UTILIZED.
12. ALL NEW DOGHOUSE MANHOLE INSTALLATIONS MUST BE INSPECTED BY CITY INSPECTORS WHO SHALL WITNESS ALL PHASES OF CONSTRUCTION.
13. CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE POST CCTV INSPECTION OF MAINLINE/ MANHOLE INTERCONNECTIONS.
14. QUALITY OF CCTV INSPECTION FILES MUST CLEARLY SHOW SUCH INTERCONNECTION IN ORDER TO EVALUATE AND APPROVE. CONTRACTOR SHALL SUBMIT A COPY OF CCTV FILE TO DSD AND PW ENGINEERING STAFF FOR REVIEW AND APPROVAL.
DSD = DEPARTMENT OF SUSTAINABLE DEVELOPMENT
PW = PUBLIC WORKS
PLAN
A-A ELEVATION
212 PRECAST CONCRETE MANHOLE BUILT OVER EXISTING CURED IN PLACE LINED SEWER PIPE
N.T.S.
EXPANSION PLUG NOTES:
1. EXPANSION PLUG SHALL NOT INTERFERE WITH LID.
2. PLUG FLANGE SHALL BE LARGER THAN PIPE I.D.
3. THREADED COMPONENTS SHALL BE FLATTENED OR STAKED TO PREVENT DISASSEMBLY.
REFER TO DETAIL 216 FOR CLEANOUT RING AND COVER
PVC CLEANOUT PLUG. SET PVC PLUG NOT TO INTERFERE WITH COVER
PVC CLEANOUT ADAPTER
SAND CUSHION TRAFFIC AREAS ONLY
PVC CLEANOUT RISER
NOTE:
1. SEE DETAILS 213 THROUGH 216 FOR ADDITIONAL CLEANOUT DETAILS AND NOTES.
214 CLEAN-OUT COVER ASSEMBLY FOR 4-INCH OR 6-INCH CLEANOUTS
N.T.S.
260
LEGEND
1 CUT & REMOVE SECTION OF HOST PIPE WHERE SERVICE CONNECTION IS TO BE MADE WITHOUT DAMAGING CIPP LINER.
2 CUT HOLE FOR LATERAL WITH DIAMETER EQUAL TO INSIDE DIAMETER OF THE PVC LATERAL IN MAIN SEWER LINER WITH POWER TOOL.
3 CONNECT 6" PVC SEWER LATERAL BY LMT™(LINED MAIN TAP) SADDLE SYSTEM.
4 SEAL THE PIPE CUTS WITH HYDRAULIC CEMENT.
5 IF NEW LATERAL SERVICE CONNECTION IS BEING CONSTRUCTED SEE TYPICAL WASTEWATER SERVICE CONNECTION DETAIL 208.
6 IF A NEW CLEAN-OUT COVER ASSEMBLY MUST BE INSTALLED SEE STANDARD DETAILS 213, 213A, 214, 215 AND 216 FOR REFERENCE
7 UNIVERSAL ADHESIVE TO BE ON THE INSIDE OF SADDLE TO FORM WATER TIGHT SEAL BETWEEN LINER AND HOST PIPE. SEE MANUFACTURE'S SPECIFICATIONS FOR MORE APPLICATION INSTRUCTIONS.
218 SADDLE TEE FASTENED TO LINED GRAVITY MAIN
N.T.S.
CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301
REVISIONS
1 03/04/21 H&S AT UPDATE FOR I&I PROGRAM
PROJECT # P0000
PROJECT NAME
DESCRIPTION
SHEET
PLACE PROJECT ADDRESS
SHEET NO.
SSWR02
CAD FILE: SSWR-02
DRAWING FILE NO. 4-XXX-XX
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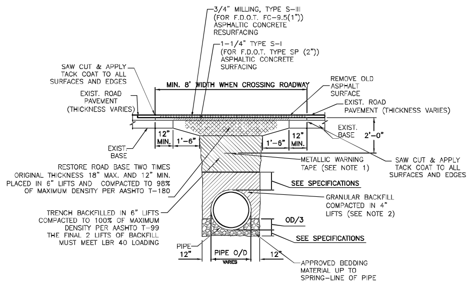
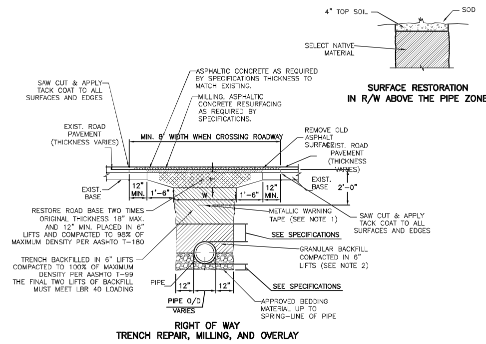


RIGHT OF WAY
TRENCH REPAIR, MILLING, AND OVERLAY

NOTES:

1. 2" WIDE METALLIC WARNING TAPES SHALL BE INSTALLED BETWEEN 12" AND 18" BELOW FINISH GRADE ABOVE MAIN.
2. UNLESS OTHERWISE SPECIFIED SELECTED MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/8" DIA.
3. REPLACE ALL LANE MARKINGS, REFLECTIVE MARKERS AND DAMAGED TRAFFIC SIGNS.
4. BASE MATERIAL SHALL HAVE A MINIMUM CARBONATE OF 70% (60% FOR LOCAL STREETS).
5. IF THE DITCH IS FILLED TEMPORARILY, IT SHALL BE COVERED WITH A 2" THICK ASPHALT CONCRETE PATCH TO KEEP THE FILL MATERIAL FROM RAVELING UNTIL REPLACED WITH PERMANENT PATCH.

100BC F.D.O.T. & BROWARD COUNTY TYPICAL TRENCH AND PAVEMENT RESTORATION
Scale: N.T.S.



RIGHT OF WAY
TRENCH REPAIR, MILLING, AND OVERLAY

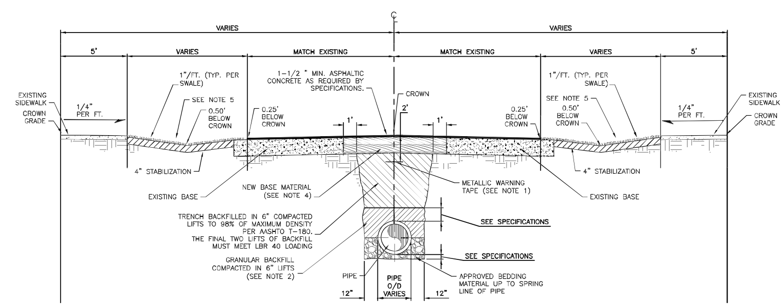
NOTES:

1. METALLIC WARNING TAPES SHALL BE INSTALLED 24" BELOW FINISH GRADE ABOVE MAIN. (SEE SPECIFICATION FOR MARKING TYPE)
2. UNLESS OTHERWISE SPECIFIED SELECTED MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/8" DIA.
3. REPLACE ALL LANE MARKINGS AND REFLECTIVE MARKERS.

T=6" PARKING
T=8" RESIDENTIAL STREETS
T=10" MAJOR STREETS (4 LANE)
T=12" MAJOR STREETS (6 LANE)

2T=18" MAX. 12" MIN.

100 TYPICAL TRENCH AND PAVEMENT RESTORATION FOR TRANSVERSE CROSSING
Scale: N.T.S.



NOTES:

1. 2" WIDE METALLIC WARNING TAPES SHALL BE INSTALLED 24" BELOW FINISH GRADE. DOES NOT APPLY TO STORM DRAINAGE PIPE INSTALLATION.
2. UNLESS OTHERWISE SPECIFIED SELECTED MATERIAL SHALL BE FREE OF STONES LARGER THAN 3/8" DIA.
3. REPLACE ALL LANE MARKINGS AND REFLECTIVE MARKERS.
4. 12" MIN. LIMEROCK BASE PLACED IN 6" LAYERS AND COMPACTED TO 98% OF MAXIMUM DENSITY PER AASHTO T-180
5. BAHIA SOD -OR- ST. AUGUSTINE "FLORITAM" SOD IN PREVIOUSLY SODDED AREAS -OR- REPLACE EXISTING IMPROVED SURFACE (e.g., ROCK OR ASPHALT PAVING TO MATCH EXISTING -IF ASPHALT, MINIMUM 1" ASPHALT OVER MINIMUM 6" COMPACTED LIMEROCK)

100B TYPICAL ROAD SECTION, TYPICAL TRENCH, PAVEMENT AND SWALE RESTORATION FOR PARALLEL PIPE TRENCH
Scale: N.T.S.

261

NOT FOR CONSTRUCTION OR BID

CIVL02

DRAWN BY:	DATE: MM/DD/YY
DESIGNED BY:	SCALE:
CHECKED BY:	
FIELD BOOK:	

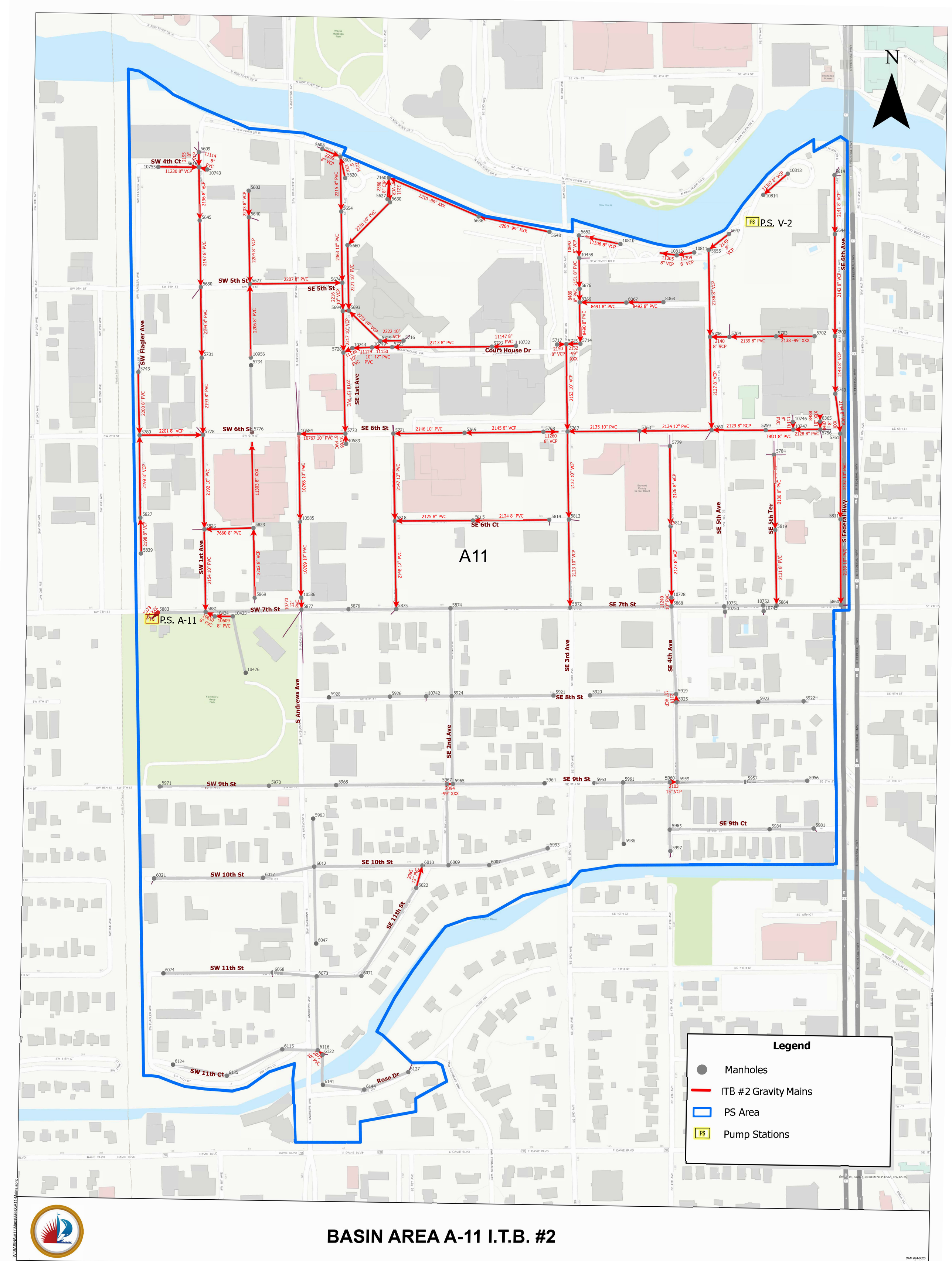
CITY OF FORT LAUDERDALE
PUBLIC WORKS DEPARTMENT
ENGINEERING & ARCHITECTURE
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.	DATE	BY	CHK'D	DESCRIPTION
1	12/07	R.C.	S.E.	DET'L 100BC MODIFIED

PROJECT # P0000
PROJECT NAME
DESCRIPTION
SHEET
PLACE PROJECT ADDRESS

SHEET NO. X-1 OF XX
TOTAL: 0
CAD FILE: XXXXX-XXX-XXXOOOO
DRAWING FILE NO. 4-XXX-XX



BASIN AREA A-11 I.T.B. #2

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SCOPE OF WORK 12464 B

No.	Pipe Segment Reference	USMH	DSMH	Number of Laterals	Length (ft)	Diameter (in)	Lined Y/N	Address	Comments	Main Recommendations	6"-12" Sewer main cleaning and TV inspection (LF)(Item 20)	14"-18" Sewer main cleaning and TV inspection	Install cure-in-place mainline liner. 8-inch x6.0 mm (LF) (Item 2)	Install cure-in-place mainline liner. 10-inch x 6.0 mm (LF) (Item 3)	Install cure-in-place mainline liner. 12-inch x 6.0 mm (LF) (Item 4)	Install cure-in-place mainline liner. 15-inch x 7.5 mm (LF) (Item 5)	Install cure-in-place mainline liner. 18-inch x 9.0 mm (LF) (Item 6)	Install cured-in-place mainline sectional 8" x 6.0.mm (6-foot)(EACH) (Item 34)	Install cured-in-place mainline sectional 10" x 6.0 mm (6-foot)(EACH)(Item 36)	Reinstate Sewer Laterals (EACH) (Item 17)	Open Cut Point Repair main 8 to 10-inch pipe, over 12-foot depth up to 15-foot depth (EA) (Item 85)	Remove Existing Liner (LF) (Item 169)	Install Cap-A-Connection Liner 10"x 4.5 mm, 2 feet in length (EA)(Item 140)	Install CIP sectional liner to seal exisitng service connection, 8" main. (EA) (Item 164)	Install CIP sectional liner to seal exisitng service connection. 10" main. (EA) (Item 165)	Mechanical root or grease removal mainline 8 inch to 12 inch (LF)(Item 25)
1	2195	A11-5609	A11-5616	0	53	8	N	SW 1 AVE	joint stain-deposits attached encrustation-fracture circumferential Install 8" liner entire length	Install Full Liner			53													
2	2197	A11-5645	A11-5680	5	240	8	Y	SW 1 AVE	no visible defects	No Action needed																
3	2194	A11-5680	A11-5731	4	255	8	Y	SW 1 AVE	deposits attached encrustation all top hat liners	No Action needed																
4	2193	A11-5731	A11-5778	5	277	8	Y	SW 1 AVE	detached lining at 103ft with cut in detached lining-detached lining at 110ft-infiltration weeper- all tophat liners Cut out defective line and install sectional	Install Sectional(s)								2		4						
5	2200	A11-5743	A11-5780	2	227	8	Y	SW FLAGLER AVE	infiltration stain-all tophat liners	No Action needed																
6	2154	A11-5826	A11-5881	9	297	8	Y	SW 1 AVE	USMH covered up. Previously lined. Grease around connection @ 248 ft and from 278-285 ft. Recommend cleaning for routine maintenance.	Other	297															
7	2199	A11-5827	A11-5780	2	297	8	N	SW FLAGLER AVE	Joint roots light-infiltration dripper and runner in numerous joints-longitudinal crack	Install Full Liner			297							2					
8	2198	A11-5839	A11-5827	2	125	8	N	SW FLAGLER AVE	Not lined. joint root tap @ 2ft-joint infiltration runner @72ft	Install Full Liner			125							2					
23	2085	A11-6022	A11-6010	1	80	12	Y	SE 11 ST	Lining failure wrinkled-linig failure pin holes stains along the entire liner-tophat connection-infiltration runner at MH A11-6010	Install Full Liner					80					1						
29	11230	A11-10755	A11-5616	3	148	8	N	SW 4 Ct	Not lined-multiple fractures-infiltration runner	Install Full Liner			148							3					
30	2196	A11-5616	A11-5645	8	188	8	N	SW 1 AVE	Not lined-Fractures/cracks throughout pipe-Multiple spiral fractures @ 161ft-Infiltration dripper/weeper/stain-Infiltration runner @ 169ft-water level 50% @ 173ft-Deposits attached encrustation-Changes from clay to pvc @ 175ft	Install Full Liner			188							8					
31	2192	A11-5778	A11-5826	9	337	8	Y	SW 1 AVE	Lined PVC from 134-139ft No visible defects	No Action needed																
32	2201	A11-5780	A11-5778	1	228	8	N	SW 6 ST	Not lined. Infiltration runner/weeper/ stain. Deposits attached encrustation. Crack longitudinal Broken @ 224.7ft	Install Full Liner			228							1						
33	2202	A11-5869	A11-5823	11	94+159	8	N	ANDREWS ALLEYWAY	10/21/19: Blocked off by construction Joint roots fine-Spiral fractures-Depositts attached encrustation 1 of 5 capped PVC from 49-57ft PVC from 86-94ft with joint offset could not pass 94ft point repair for offset @ 94ft 10/24/19: Performed reverse setup (DSMH to USMH) Fractures/cracks throughtout pipe PVC from 128-132ft PVC from 152-158ft cannot pass joint offset @ 158ft 6 of 13 are capped and 1 drop by dsmh	Point of Repair + Full Liner			253							11	1				
34	7660	A11-5823	A11-5826	3	176	8	N	SW 6 CT	Blocked off by construction 1 Drop near DSMH Not lined	Install Full Liner	176		176							3						
35	2203	A11-5603	A11-5640		288			ANDREWS ALLEYWAY	Blocked off by construction-no access-blocked off at MH A11-5677		288															
36	2204	A11-5640	A11-5677	2	63	8	N	ANDREWS ALLEYWAY	Blocked off by construction Longitudinal crack-Deposits attached encrustation-Deposits settled fine Capped lateral @ 55ft Main is capped @ 62ft-Install MH or wait for construction to be over	Other	63															
37	2205	A11-5776	A11-5734	6	238	8	Y	ANDREWS ALLEYWAY	Liner surface with blisters @ 70-80ft 1 of 6 capped Install sectional to cover capped lateral visible from the mainline @ 51ft	Install Sectional										4				2		
38	2206	A11-10956	A11-5677	1	289	10	Y	ANDREWS ALLEYWAY	Blocked off by construction Lined-No visible defects	No Action needed																
39	2207	A11-5677	A11-5674	4	335	8	Y	SW 5 ST	Court house-night work 9/9/19 line was surcharged. Went back and TV'd 9/12/19. Had to clean 2 times. 2 Tophats 2 of 4 are capped tophats	No Action needed																
40	2208	A11-5605	A11-5607	2	68	8	N	S NEW RIVER DR E	Court house-Night work Multiple fractures/cracks throughtout pipe-Deposits attached encrustation-Infiltration-Infiltration weeper/stains	Install Full Liner			68							2						
41	2215	A11-5607	A11-5654	2	198	8	Y	SE 1 AVE	No MH at A11-5620. End at A11-5654 1 Tophat connection Court house-Night work	No Action needed																
42	2363	A11-5654	A11-5674	3	257	8	Y	SE 1 AVE	Court house-Night work Lateral medium roots-Deposits attached encrustation Root ball @ 199ft in lateral entrance	No Action needed																

SCOPE OF WORK 12464 B

No.	Pipe Segment Reference	USMH	DSMH	Number of Laterals	Length (ft)	Diameter (in)	Lined Y/N	Address	Comments	Main Recommendations	6"-12" Sewer main cleaning and TV inspection (LF)(Item 20)	14"-18" Sewer main cleaning and TV inspection	Install cure-in-place mainline liner. 8-inch x6.0 mm (LF) (Item 2)	Install cure-in-place mainline liner. 10-inch x 6.0 mm (LF) (Item 3)	Install cure-in-place mainline liner. 12-inch x 6.0 mm (LF) (Item 4)	Install cure-in-place mainline liner. 15-inch x 7.5 mm (LF) (Item 5)	Install cure-in-place mainline liner. 18-inch x 9.0 mm (LF) (Item 6)	Install cured-in-place mainline sectional 8" x 6.0.mm (6-foot)(EACH) (Item 34)	Install cured-in-place mainline sectional 10" x 6.0 mm (6-foot)(EACH)(Item 36)	Reinstate Sewer Laterals (EACH) (Item 17)	Open Cut Point Repair main 8 to 10-inch pipe, over 12-foot depth up to 15-foot depth (EA) (Item 85)	Remove Existing Liner (LF) (Item 169)	Install Cap-A-Connection Liner 10"x 4.5 mm, 2 feet in length (EA)(Item 140)	Install CIP sectional liner to seal exisitng service connection, 8" main. (EA) (Item 164)	Install CIP sectional liner to seal exisitng service connection. 10" main. (EA) (Item 165)	Mechanical root or grease removal mainline 8 inch to 12 inch (LF)(Item 25)
43	2216	A11-5674	A11-5694	1	103	8	N	SE 1 AVE	Court house-Night work Not lined. Multiple fractures/cracks Hole @ 75ft with obtsacle intruding through wall-CANNOT PASS-NEED POINT REPAIR From reverse setup: TF @ 20ft 12 o'c Blocked-Unsure if active. No tophats	Point of Repair + Full Liner			103							1	1					
44	2217	A11-5694	A11-5728	5	137	10	N	SE 1 AVE	Court house-Night work Tophat connections-crack longitudinal/spiral-Fracture spiral/longitdunal hinge-Infiltration gusher/runner	Install Full Liner				137						5						
45	2218	A11-5728	A11-5773	0	64	10	N	SE 1 AVE	Court house-Night work Infiltration runner-Fracture circumferential-Crack spiral-Fracture spiral-Crack longitudinal-Fracture circumferential-PVC at 35.9ft Manhole @8ft A11-5728A Joint offset medium at 64.3ft-Recommend Point repair CANNOT PASS- do reverse setup!!!	Point of Repair + Full Liner				64							1					
46	2218	A11-5728A	A11-5773	10	289	10	N	SE 1 AVE	Longitudinal cracks-Fractures Infiltration stain/runner/dripper Joint encrustation PVC Connections @ 28ft, 193ft, 195ft	Install Full Liner				289						10						
47	10766	A11-10583	A11-5773	2	34	8	N	SE 1 AVE	Deposits settled compacted 20%-no tophat connections Tee @ MH A11-5773 Court house-Night work	Install Full Liner			34							2						
48	10767	A11-5773	A11-10584	0	163	10	N	SE 6 ST	County MOT-Court house night work Vitrified clay No visible defects	Install Full Liner				163												
49	10768	A11-10584	A11-10585	1	313	10	N	S ANDREWS AVE	County MOT Not lined	Install Full Liner				313						1						
50	10769	A11-10585	A11-10586	2	270	10	N	S ANDREWS AVE	County MOT No visible defects in main. Lateral at 191.7 ft is blocked- possibly capped	Install Full Liner				270						2						
51	10770	A11-10586	A11-5877	0	40	10	N	S ANDREWS AVE	County MOT 11/27/19: Vitrified clay-Not lined	Install Full Liner				40												
52	2209	A11-5648	A11-5636		263			S NEW RIVER DR E	MANHOLES NOT FOUND. LIKELY UNDER PAVERS. Court house-Night work	No Action needed	263															
53	2210	A11-5636	A11-7160		357			S NEW RIVER DR E	MANHOLES NOT FOUND. LIKELY UNDER PAVERS. Court house-Night work	No Action needed	357															
56	2220	A11-5630	A11-5660	1	216	10	Y	SE 1 AVE	LINE 3 TIMES AND VAC. Deposits settled compacted @ 0-1ft Deposits attached encrustation Court house-Night work	No Action needed	216															
57	2221	A11-5660	A11-5693	1	235	10	Y	SE 1 AVE	Court house-Night work NO VISIBLE DEFECTS	No Action needed																
58	2219	A11-5693	A11-5694	0	18	10	N	SE 1 AVE	Court house-Night work Clay- not lined	Install Full Liner				18												
59	2222	A11-5716	A11-5719	2	74	10	N	COURT HOUSE DR	Need permission to access gate Court house-Night work Clay-Unlined Weld failure circumferential	Install Full Liner				74						2						
60	2223	A11-5719	A11-5693	0	31	10	N	COURT HOUSE DR	Need permission to access gate Court house-Night work TOP HAT @ 155.50 ft , 187 ft, 301 ft, TV'D Upstream from DSMH TO USMH ran into sewer grinder @ 30 ft and could not continue Clay - Not lined	Install Full Liner				31												
61	2213	A11-5722	A11-5722A	6	358	10	Y	COURT HOUSE DR	Court house-Night work Lined-NO VISIBLE DEFECTS 1 capped 109 ft @ main Need permission to access gate. Letter from City dropped off	No Action needed																
62	2213	A11-5722A	A11-5723	1	71	10		COURT HOUSE DR	Not lined Need permission to access gate. Letter from City dropped off	Install Full Liner				71						1						
64	2147	A11-5771	A11-5818	6	311	10	Y	SE 1 AVE	Court house-Night work Lined-NO VISIBLE DEFECTS	No Action needed																
65	2148	A11-5818	A11-5875	6	316	10	Y	SE 1 AVE	Infiltration stain/runner @ tophat connection Infiltration weeper. Changes to PVC @ 150ft to 153.7ft. Lining change	No Action needed																
66	2145	A11-5768	A11-5769	8	284	8	N	SE 6 ST	Circumferential crack-Infiltration weeper/runner/stains-Deposits attached encrustation Court house night work	Install Full Liner			284							8						
67	2146	A11-5769	A11-5771	7	258	8	Y	SE 6 ST	4 Tophats-Infiltration dripper @ tophat connections Court house night work	No Action needed																
68	2124	A11-5814	A11-5815	7	276	8	Y	SE 6 CT	Holes in liner for unknown reason Court house night work Install sectionals to cover holes @ 172ft, 209ft, and 230ft	Install Sectional(s)										7			4			
69	2125	A11-5815	A11-5818	8	279	8	Y	SE 6 CT	Infiltration stain Drop @ 279ft Court house night work	Other	279															

SCOPE OF WORK 12464 B

No.	Pipe Segment Reference	USMH	DSMH	Number of Laterals	Length (ft)	Diameter (in)	Lined Y/N	Address	Comments	Main Recommendations	6"-12" Sewer main cleaning and TV inspection (LF)(Item 20)	14"-18" Sewer main cleaning and TV inspection	Install cure-in-place mainline liner. 8-inch x6.0 mm (LF) (Item 2)	Install cure-in-place mainline liner. 10-inch x 6.0 mm (LF) (Item 3)	Install cure-in-place mainline liner. 12-inch x 6.0 mm (LF) (Item 4)	Install cure-in-place mainline liner. 15-inch x 7.5 mm (LF) (Item 5)	Install cure-in-place mainline liner. 18-inch x 9.0 mm (LF) (Item 6)	Install cured-in-place mainline sectional 8" x 6.0.mm (5-foot)(EACH) (Item 34)	Install cured-in-place mainline sectional 10" x 6.0 mm (5-foot)(EACH)(Item 36)	Reinstate Sewer Laterals (EACH) (Item 17)	Open Cut Point Repair main 8 to 10-inch pipe, over 12-foot depth up to 15-foot depth (EA) (Item 85)	Remove Existing Liner (LF) (Item 169)	Install Cap-A-Connection Liner 10"x 4.5 mm, 2 feet in length (EA)(Item 140)	Install CIP sectional liner to seal exisitng service connection, 8" main. (EA) (Item 164)	Install CIP sectional liner to seal exisitng service connection. 10" main. (EA) (Item 165)	Mechanical root or grease removal mainline 8 inch to 12 inch (LF)(Item 25)
70	10642	A11-5652	A11-10458		80			SE 3 AVE	County MOT-Court house-Night work Mainilne is dirty-Need Vac Truck-No DSMH Manhole 5652 dose not connect to 10458. 5652 water was above invert but water was clear and doesn't seem to be flowing MANHOLE LIKELY ABANDONED	Other	80															
71	2151	A11-10458	A11-5676	1	108	8	N	SE 3 AVE	County MOT-Court house-Night work Crack circumferential at 104.8 ft	Install Full Liner			108							1						
72	8489	A11-5676	A11-8366	0	47	8	N	SE 3 AVE	County MOT-Court house-Night work PVC at 40.5 ft to 47 ft	Install Full Liner			47													
73	8490	A11-8366	A11-5714	2	146	8	N	SE 3 AVE	County MOT-Court house-Night work PVC at 39 ft to 42 ft with joint offset Recommend point repair	Point of Repair + Full Liner			146							2	1					
74	2152	A11-5714	A11-5715	0	47	8	N	COURT HOUSE DR	Not lined. Vitrified clay Court house-Night work	Install Full Liner			47													
75	2150	A11-5717	A11-5715	0	29	8	N	COURT HOUSE DR	Not lined-crack longitudinal Court house-Night work	Install Full Liner			29													
76	2153	A11-5715	A11-5767	5	313	8	Y	SE 3 AVE	County MOT-Court house-Night work Tophat connections-1 of 5 capped-crack longitudinal-infiltration stain-hole at 188 ft-deposits attached encrustation Install sectional to cover capped lateral @ 48ft Install sectional to cover hole @ 188ft	Install Sectional(s)										5				3		
77	2122	A11-5767	A11-5813	3	260	10	N	SE 3 AVE	County MOT-Court house-Night work Cast Iron-tuburculated Deposits attached grease Obstacle @ 124ft-looks like plumbers snake in main Cannot pass From reverse setup: tuburculated cast iron-Obstacle @136ft cannot pass Pipe length on map is 320ft therefore missing approximately 60ft of survey Obstacle was removed 1/17/20 Descale before lining	Install Full Liner				260						3						
78	2123	A11-5813	A11-5872	7	308	10	N	SE 3 AVE	County MOT Cast iron with heavy tuburculation Deposits attached Recommened descaling before lining	Install Full Liner				308						7						
79	8492	A11-8368	A11-8367	3	132	8	N	NO NAME ROAD	All PVC-Heavy flow @ 115ft lateral Court house-Night work	No Action needed																
80	8491	A11-8367	A11-8366	1	168	8	N	NO NAME ROAD	All PVC Court house-Night work	No Action needed																
81	2149	A11-5647	A11-5655	2	84+	8	N	S NEW RIVER DR E	Court house-Night work Surveyor could not locate usmh. Performed reverse setup. PVC @ 0.3-4ft and 9-20ft with joint offset medium and 31-35ft and 69ft-Holes void visible Root ball in TF @ 43ft Capped TF @ 65ft Large joint offset at 84'-Need point repair Unable to reach usmh but can be seen about 6 ft ahead Do not reinstate capped srv @ 65ft	Point of Repair + Full Liner				84						2	1					
82	2136	A11-5655	A11-5706A	0	20	8	N	SE 5 AVE	Court house night work MH not marked on map A11-5706A Infiltration weeper	Install Full Liner			20													
83	2136	A11-5706A	A11-5706	10	293	8	N	SE 5 AVE	Circumferential fracture-Deposits settled compacted in lateral @ 49ft possible plugged/abandoned-Joint offset medium-Infiltration weeper-Joint roots light 8 of 10 are capped at main Do not reinstate capped services @ 33ft, 48ft, 59ft, 57ft, 105ft, 186ft, 209ft and 232ft	Install Full Liner				293						10						
84	2137	A11-5706	A11-5760	8	335	8	N	SE 5 AVE	Infiltration stain/weeper/runner Roots Medium 4 of 8 lats are capped @ main Do not reinstate capped srv @ 62ft, 110ft, 162ft and 261ft	Install Full Liner			335							8						
85	2138	A11-5702	A11-5703		141	8	N	ALLEYWAY	Cannot get to A11-5702 so performed reverse setup. Brick object in pipe @ 2 ft CAMERA UNDERWATER @ 17 ft No visibility could not continue GOES UNDER PARKING LOT Investigated again 4/27/2020-MH5703 is buried Court house-Night work	Other	141															
86	2139	A11-5703	A11-5704	0	92	8	N	ALLEYWAY	Court house-Night work Unable to locate USMH A11-5703 because buried. Performed reverse setup. Obstacles rocks in MH A11-5703	Install Full Liner			92													
87	2140	A11-5704	A11-5706	0	66	8	N	ALLEYWAY	Court house-Night work PVC from 0-1 ft and 27-38 ft Joint offset medium-Longtiudinal fracture-Circumferential crack-Infiltration weeper	Install Full Liner			66													
88	8487	A11-8365	A11-5756	0	26	8	N	SE 6 ST	No visible defects DSMH is A11-5759 MAP IS INCORRECT THE CORRECT DSMH IS A11-5756A	Install Full Liner			26													
89	2128	A11-5756	A11-10747	4	95	8	N	SE 6 ST	Infiltration stain	Install Full Liner			95							4						

SCOPE OF WORK 12464 B

No.	Pipe Segment Reference	USMH	DSMH	Number of Laterals	Length (ft)	Diameter (in)	Lined Y/N	Address	Comments	Main Recommendations	6"-12" Sewer main cleaning and TV inspection (LF)(Item 20)	14"-18" Sewer main cleaning and TV inspection	Install cure-in-place mainline liner. 8-inch x6.0 mm (LF) (Item 2)	Install cure-in-place mainline liner. 10-inch x 6.0 mm (LF) (Item 3)	Install cure-in-place mainline liner. 12-inch x 6.0 mm (LF) (Item 4)	Install cure-in-place mainline liner. 15-inch x 7.5 mm (LF) (Item 5)	Install cure-in-place mainline liner. 18-inch x 9.0 mm (LF) (Item 6)	Install cured-in-place mainline sectional 8" x 6.0.mm (6-foot)(EACH) (Item 34)	Install cured-in-place mainline sectional 10" x 6.0 mm (6-foot)(EACH)(Item 36)	Reinstate Sewer Laterals (EACH) (Item 17)	Open Cut Point Repair main 8 to 10-inch pipe, over 12-foot depth up to 15-foot depth (EA) (Item 85)	Remove Existing Liner (LF) (Item 169)	Install Cap-A-Connection Liner 10"x 4.5 mm, 2 feet in length (EA)(Item 140)	Install CIP sectional liner to seal exisitng service connection, 8" main. (EA) (Item 164)	Install CIP sectional liner to seal exisitng service connection. 10" main. (EA) (Item 165)	Mechanical root or grease removal mainline 8 inch to 12 inch (LF)(Item 25)
90	2191A	A11-10747	A11-5759	2	94	8	N	SE 6 ST	Court house night work Infiltration weeper/stain-Deposits settled compacted	Install Full Liner			94							2						
91	2129	A11-5759	A11-5760	4	200	8	N	SE 6 ST	Court house night work Deposits attached encrustation-Surface aggregate visible-Infiltration stain 1of 4 capped Do not reinstate capped srv @ 110ft	Install Full Liner			200							4						
92	2134	A11-5760	A11-5763	6	260	10	Y	SE 6 ST	Court house night work Loose seam tape @105ft 1 of 6 is capped Lining undercut @ TF 121ft Install cap-a-connection to cover capped connection @ 6ft	Cut out excess lining + Install Sectional									1	3		8	1			
93	2135	A11-5763	A11-5767	5	259	10	Y	SE 6 ST	County MOT-Court house-Night work 1 of 5 is capped Infiltration gusher @ srv @ 85ft Install sectional to cover capped lateral @ 4ft	Install Sectional(s)									1	3					1	
94	2126	A11-5779	A11-5817	11	286	10	N	SE 4 AVE	Court house-Night work Diameter incorrect on map. Spiral fracture-Joint roots medium-Joint roots tap-Infiltration weeper/stains 5 of 11 capped PVC @ 111-115ft Do not reinstate srv @ 31ft, 63ft, 72ft, 105ft and 253ft	Remove Roots + Full Liner				286							11						150
95	2127	A11-5817	A11-5868	10	256	10	N	SE 4 AVE	Court house-Night work Diameter says 8" on map. Had to clean 2 times-Not lined 2 OF 10 CAPPED @ 113ft and 164ft Infiltration gusher @ 60ft-Hole-Deposits attached encrustaion-Joint infiltration stain Do not reinstate capped srv @ 112ft and 163ft	Install Full Liner				256							10						
96	2130	A11-5784	A11-5819	6 lat + 2 mh shots	267	8	Y	SE 5 TERR	Loose seam tape @ 5ft gusher @ 193ft with water level 30% cut out defective line and install sectional	Install Sectional(s)								2		4		16				
97	2131	A11-5819	A11-5864	8	268	8	Y	SE 5 TERR	Capped @ 203ft Install sectional Drop @ 265ft 3 Tophat liners 1 of 8 capped	Install Sectional(s)								2		4						
98	2141	A11-5614	A11-5644	4	211	8	N	EAST AVE/S FEDERAL HWY	County MOT-One way street Infiltration runner-crack longitudinal/circumferential	Install Full Liner			211							4						
99	2142	A11-5644	A11-5700	7	361	8	N	EAST AVE/S FEDERAL HWY	County MOT-One way street Roots fine joint-crack longitudinal-deposits attached encrustation-infiltration runner-fracture longitudinal/hinge	Install Full Liner			361							7						
100	2143	A11-5700	A11-5740	3	205	8	N	EAST AVE/S FEDERAL HWY	County MOT-One way street Fracture circumferential-crack spiral-infiltration runner	Install Full Liner			205							3						
101	2144	A11-5740	A11-5761	2	144	8	N	EAST AVE/S FEDERAL HWY	County MOT-One way street Crack longitudinal	Install Full Liner			144							2						
102	2132	A11-5761	A11-5811	5	305	10	Y	S FEDERAL HWY	FDOT Tophat connections-no visible defects	No Action needed																
103	2133	A11-5811	A11-5860	6	305	10	Y	S FEDERAL HWY	FDOT Tophat connections-Lining failure blistered at 13.8 ft to 20 ft Lining failure detached at 21 ft to 42 ft, at 161 ft to 167 ft and at 178 ft to 184 ft Cut out defective areas and install full liner from manhole to manhole	Install Full Liner				305							6						
115	2373	A11-5883	PS-A11	0	23	18	Y	SE 7 ST	Not Lined Deposits settled compacted	Install Full Liner							23									
117	10609	A11-10425	A11-10424	0	63	8	N	SE 7 ST	Not lined.	Install Full Liner			63													
118	11515	A11-10424	A11-5881	0	35	8	N	SE 7 ST	Not lined.	Install Full Liner			35													
126	2094	A11-5967	A11-5965	0	17	12	N	SE 2 AVE	Not lined	Install Full Liner					17											
137	2077	A11-6122	A11-6116	0	20	10	y	S ANDREWS AVE	County MOT Rib throughout pipe @ 16ft to 19 ft	No Action needed																
142	2114	A11-5925	A11-5919	0	27	15	N	SE 4 AVE	Infiltration runner	Install Full Liner						27										
146	2103	A11-5960	A11-5959	0	24	15	N	SE 9 ST	Infiltration stain/weeper/runner	Install Full Liner						24										
											2160	0	4658	2885	97	51	23	6	2	185	5	24	1	9	1	150

							Main						Lateral																
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y & T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
276		A11	A11-8368	8492	A11-8367	511 SE 5 AVE	39	R	6.1	132	N	8	6	Y	25	No visible defects-PVC 9 o'clock wye @ 19 ft		No Action needed											
277		A11	A11-8368	8492	A11-8367	511 SE 5 AVE	39	R-L	6.1	132	N	8		Y		Not launched-No need to TV Mainline is PVC and lateral and wye are both PVC		No Action needed											
278		A11	A11-8368	8492	A11-8367	511 SE 5 AVE	117	R	6.1	132	N	8	6	Y	12	No visible defects PVC		No Action needed											
279	Grass / Dirt / Gravel / 3.5	A11	A11-5614	2141	A11-5644	501 S FEDERAL HWY	37	R	4.5	211	N	8	6	Y	6	Infiltration runner CAPPED	Don't Reinstate	Don't Reinstate											
280	Grass / Dirt / Gravel / 3.1	A11	A11-5614	2141	A11-5644	501 S FEDERAL HWY	83	R	4.5	211	N	8	6	Y	6	Roots fine joint CAPPED	Don't Reinstate	Don't Reinstate											
281	Grass / Dirt / Gravel / 3.2	A11	A11-5614	2141	A11-5644	501 S FEDERAL HWY	133	R	4.5	211	N	8	6	Y	6	CAPPED	Don't Reinstate	Don't Reinstate											
282	Grass / Dirt / Gravel / 3.7	A11	A11-5614	2141	A11-5644	501 S FEDERAL HWY	182	R	4.5	211	N	8	6	Y	6	Roots fine joint		Install T-Liner			1								
283	Grass / Dirt / Gravel / 3.3	A11	A11-5700	2143	A11-5740	520 SE 5 AVE	21	T-R	6.5	204	N	8	6	T	8	Roots fine barrel-Roots ball joint CAPPED	Don't Reinstate	Don't Reinstate											
284	Grass / Dirt / Gravel / 3.1	A11	A11-5700	2143	A11-5740	520 SE 5 AVE	71	T-R	6.5	204	N	8	6	T	6	Roots fine barrel Leads to parking garage Appears to be abandoned-Possibly capped	Don't Reinstate	Don't Reinstate											
285	Grass / Dirt / Gravel / 3.7	A11	A11-5700	2143	A11-5740	520 SE 5 AVE	109	T-R	6.5	204	N	8	6	T	8	Roots medium/fine barrel CAPPED	Don't Reinstate	Don't Reinstate											
286	Concrete / Sidewalk / 4.5	A11	A11-5740	2144	A11-5761	520 SE 5 AVE	3	T-R	7.0	143	N	8	6	T	5	Roots tap joint-Deposits settled fine Cannot pass 5.5 ft Possibly abandoned	Don't Reinstate	Don't Reinstate											
287		A11	A11-5740	2144	A11-5761	608 S FEDERAL HWY	139	L	7.0	143	N	8	6	Y	97	Deposits attached encrustation Fracture circumferential Could not locate		Install T-Liner			1			82					
291	Asphalt / 3.5	A11	A11-10458	2151	A11-5676	511 SE 5 AVE	56	L	5.9	107	N	8	6	Y	3	Broken soil visible-Joint offset medium at 2 ft-Pipe collapse		Point of Repair										1	
292	Asphalt / 4.7	A11	A11-8366	8490	A11-5714	201 SE 6 ST	69	L	7.0	146	N	8	6	Y	3	Joint offset medium-Fracture longitudinal hinge CAPPED	Don't Reinstate	Don't Reinstate											
293		A11	A11-8366	8490	A11-5714		37	T								Couldn't pull back over joint offset in main to launch			1										
294	Asphalt / 8.2	A11	A11-5715	2153	A11-5767	SE 3 AVE	51	T	9.6	312	Y	8	6	T	1	tophat connection CAPPED @ 1 FT	Remove Top Hat	Install Cap-A-Connection							1			1	
295	Concrete / Sidewalk	A11	A11-5715	2153	A11-5767	540 SE 3 AVE	114	T-L	9.6	312	Y	8	6	T	52	tophat connection Joint offset medium 3 ft PVC from 24.5 ft to 47 ft	Remove Top Hat	Install T-Liner			1			37			1	
296	Asphalt / 5.8	A11	A11-5715	2153	A11-5767	540 SE 3 AVE	169	T-L	9.6	312	Y	8	6	T	15	Tophat connection Wye @ 9 o'clock @ 1.6 FT Deposits attached encrustation 20% Tuberculation cast iron Cannot get through due to deposits Likely abandoned	Remove Top Hat	Install Cap-A-Connection							1			1	
297	Asphalt / 3.8	A11	A11-5715	2153	A11-5767	540 SE 3 AVE	169	T-R	9.6	312	Y	8	6	Y	10	WYE Cannot get through due to tuberculation cast iron 4"	Don't Reinstate	Don't Reinstate											
298	Asphalt / 5.11	A11	A11-5715	2153	A11-5767	201 SE 6 ST/ 540 SE 3 Ave	219	T	9.6	312	Y	8	6	T	3	Tophat connection CAPPED @ T	Remove Top Hat	Install Cap-A-Connection							1			1	
299	Asphalt /	A11	A11-5715	2153	A11-5767	201 SE 6 ST/ 540 SE 3 AVE	269	T	9.6	312	Y	8	6	T	2	Tophat connection CAPPED	Remove Top Hat	Install Cap-A-Connection							1			1	
300	Asphalt / 9.6	A11	A11-5763	2135	A11-5767	SE 6 ST	7	T	9.6	259	Y	10	6	T	0	CAPPED @ main	Install Cap-A-Connection	Install Cap-A-Connection								1			
301	Asphalt / 4.2	A11	A11-5763	2135	A11-5767	540 SE 3 AVE	46	T-R	9.6	259	Y	10	6	T	34	12 o'clock wye Spiral fracture Wye @ 1.6 ft 9 o'c Did not go to end		Install T-Liner			1			19					
302	Asphalt / 5	A11	A11-5763	2135	A11-5767	600 SE 3RD AVE	46	T-L	9.6	259	Y	10	6	T	4	Couldn't get passed the 90 turn in the lateral. Marked S/L		Install T-Liner			1								
303	Asphalt / 5	A11	A11-5763	2135	A11-5767	600 SE 3RD AVE	85	T-L	9.6	259	Y	10	6	T	7	Couldn't get passed the 90 turn in the lateral. Marked S/L		Install T-Liner			1								
304	Asphalt / 4	A11	A11-5763	2135	A11-5767	540 SE 3RD AVE	123	T-R	9.6	259	Y	10	6	T	32	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection								1			
305	Asphalt / 5.6	A11	A11-5763	2135	A11-5767	600 SE 3RD AVE	171	T-L	9.6	259	Y	10	6	T	2	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection								1			
327		A11	A11-5677	2207	A11-5674	S ANDREWS AVE	60	T		335	Y	8	6	T	0	Tophat capped at main Did not launch Remove tophat and install sectional	Remove Top Hat	Install Cap-A-Connection							1			1	

							Main						Lateral																
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y or T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
328	Grass / Dirt / Gravel / 4	A11	A11-5677	2207	A11-5674	441 S ANDREWS AVE	87	T-L		335	Y	8	6	Y	12	Tophat liner Tuberculated Cast Iron CANNOT CONTINUE at 12 ft (Using Hydrus camera) Leads to new construction Remove Tophat install cap-a-connection	Remove Top Hat	Install Cap-A-Connection							1			1		
329		A11	A11-5677	2207	A11-5674	S ANDREWS AVE	236	T		335	Y	8	6	T	0	Tophat capped at main Did not launchRemove tophat and install sectional	Remove Top Hat	Install Cap-A-Connection							1			1		
330	Asphalt	A11	A11-5677	2207	A11-5674	440 S ANDREWS AVE	288	T		335	Y	8	6	Y	0	Tophat liner Cast Iron CANNOT ACCESS Remove tophat		Dye Test			1							1		
331	Sidewalk	A11	A11-5654	2363	A11-5674	PARKING LOT	6	T		257	Y	8	6	Y	1	Roots fine lateral Cast Iron Blocked by roots	Remove Top Hat	Install Cap-A-Connection							1			1		
332	Sidewalk	A11	A11-5654	2363	A11-5674	440 S ANDREWS AVE	106	T		257	Y	8	6	Y	1	Deposits attached encrustation Could not get passed heavy tuberculated cast iron	Install Cap-A-Connection	Install Cap-A-Connection							1					
333		A11	A11-5654	2363	A11-5674	440 S ANDREWS AVE	154	T-R		257	Y	8	6	Y	8	Cast Iron CANNOT PASS 7.5 FT DUE TO CLAY		Install T-Liner			1									
334	Grass / Dirt / Gravel	A11	A11-5607	2215	A11-5654	PARKING LOT SE 1 ST	64	L		198	Y	8	6	Y	5	PVC CANNOT CONTINUE POSSIBLY CAPPED Verify if active	Install Cap-A-Connection	Install Cap-A-Connection							1					
335	Grass / Dirt / Gravel	A11	A11-5607	2215	A11-5654	10 SOUTH NEW RIVER E	68	R		198	Y	8	6	Y	3	Tophat Liner Deposits settled fine 25%t-Liner Remove tophat and install T-Liner	Remove Top Hat	Install T-Liner			1							1		
336	Pavers / 3.5	A11	A11-5605	2208	A11-5607	10 SOUTH NEW RIVER E	9	R		68	N	8	6	Y	11	Broken at 0 ft Cast Iron Marked for CO Install		Install T-Liner			1									
337	Pavers / 4.3	A11	A11-5605	2208	A11-5607	10 SOUTH NEW RIVER E	46	R		68	N	8	6	Y	10	Fracture Multiple Deposits attached encrustation		Install T-Liner			1									
349	Concrete / Sidewalk / 5	A11	A11-5674	2216	A11-5694	501 S ANDREWS AVE	77	T	5.0	100	N	8	6	Y	1	Full of heavy deposits-Cannot get through Likely abandoned	Don't Reinstate	Don't Reinstate												
350	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	501 S ANDREWS AVE	5	T	7.1	137	N		6	Y	3	CAPPED	Don't Reinstate	Don't Reinstate												
351	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	501 S ANDREWS AVE	46	T	7.1	137	N		6	Y	6	WYE @ 9 o'clock capped at 4 ft Deposits ingress other Likely abandoned?	Don't Reinstate	Don't Reinstate												
352	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	501 S ANDREWS AVE	61	T	7.1	137	N		6	Y	2	Infiltration weeper CAPPED	Don't Reinstate	Don't Reinstate												
353	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	501 S ANDREWS AVE	106	T	7.1	137	N		6	Y	4	Cast Iron PVC @ 2.5 ft Double wye 3 & 9 o'clock Verify if wyes are actitve. Do not reinstate if wyes are abandoned WENT TO DYE TEST ON 3/6/2020. Abandoned building. Inactive.		Dye Test												
354	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	524 S ANDREWS AVE	106	T-L	7.1	137	N		6	Y	2	WYE NEED BRUSHING UNKNOWN IF ACTIVE CANNOT ACCESS Verify if active		Dye Test												
355	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	550 S ANDREWS AVE	106	T-R	7.1	137	N		6	Y	2	WYE Deposits settled other 20% Deposits settled fine 75% CANNOT CONTINUE-Likely abandoned?	Don't Reinstate	Don't Reinstate												
356	Concrete / Sidewalk / 5	A11	A11-5694	2217	A11-5728	580 S ANDREWS AVE	119	T	7.1	137	N		6	Y	2	CAPPED	Don't Reinstate	Don't Reinstate												
357	Concrete / Sidewalk / 5	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	10	T-R	9.4	289	N	10	6	Y	9	WYE @ 9 o'clock Deposits settled fine CANNOT CONTINUE-Likely abandoned	Don't Reinstate	Don't Reinstate												
358		A11	A11-5728A	2218	A11-5773	201 SE 6TH ST	28	L	9.4	289	N	10	6	Y	39	No visible defects PVC		No Action needed												
359	Concrete / Sidewalk / 6	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	52	T-R	9.4	289	N	10	6	Y	2	Heavy tuberculation CANNOT ACCESS marked s/l Likely abandoned	Don't Reinstate	Don't Reinstate												

							Main						Lateral															
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y & T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
360	Concrete / Sidewalk / 6	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	104	T-R	9.4	289	N	10	6	Y	15	WYE @ 9 o'clock possibly capped Wye @ 3 o'clock Heavy deposits CANNOT CONTINUE-Likely abandoned	Don't Reinstate	Don't Reinstate												
361	Concrete / Sidewalk / 6	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	131	T-R	9.4	289	N	10	6	Y	4	CAPPED	Don't Reinstate	Don't Reinstate												
362		A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	143	R	9.4	289	N	10	6	Y	10	PVC No visible defects	No Action Needed	No Action needed												
363		A11	A11-5728A	2218	A11-5773	201 SE 6TH ST	195	L	9.4	289	N	10	6	Y	39	Camera underwater @ connection PVC Connection No visible defects	No Action Needed	No Action needed												
364		A11	A11-5728A	2218	A11-5773	201 SE 6TH ST	197	L	9.4	289	N	10	6	Y	36	PVC CONNECTION No visible effects	No Action Needed	No Action needed												
365	Concrete / Sidewalk / 7	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	200	T-R	9.4	289	N	10	6	Y	9	Wye @ 3 o'clock Wye @ 9 o'clock-cannot access due to heavy tuberculation CANNOT CONTINUE-HEAVY DEPOSIT Verify if active		Dye Test	1											
366	Grass / Dirt / Gravel / 6	A11	A11-5728A	2218	A11-5773	550 S ANDREWS AVE	219	T-R	9.4	289	N	10	6	Y	9	Heavy deposit CANNOT CONTINUE	Don't Reinstate	Don't Reinstate												
369		A11	A11-10585	10769	A11-10586	612 S ANDREWS AVE	43	L	11.2	270	N	10	4	Y	25	PVC Camera underwater @ 11 ft		No Action needed												
370		A11	A11-10585	10769	A11-10586	612 S ANDREWS AVE	191	L	11.2	270	N	10	4	Y	2	Deposits settled fine 95% PVC? CANNOT GET THROUGH FULL OF DEBRIS Verify if active		Dye Test	1											
371	Asphalt / 6 No above ground pic	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	4	T	6.0	258	Y	8	6	T	4	Tophat lined up to 1 ft Infiltration dripper-Deposits settled fine Pipe is dry-Unknown if active Went to dye test 3/6/2020: Abandoned courthouse. No access points.		Dye Test	1											
372	Concrete / Sidewalk / 5	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	34	R	6.0	258	Y	8	6	Y	45	Not lined-Vitirified Clay Infiltration stain		Install T-Liner			1		30							
373	Asphalt / 3.5	A11	A11-5769	2146	A11-5771	110 SE 6TH ST	51	T-R	6.0	258	Y	8	6	T	17	Tophat lined up to 1 ft Wye @ 1 ft 9 o'c CAPPED Wye @ 1 ft 3 0'c UNABLE TO ACCESS because of heavy deposits. Full of dry sand-Cannot pass Likely abandoned If wye is abandoned then install cap-a-connection	Remove Top Hat	Install Cap-A-Connection	1					1			1		
374		A11	A11-5769	2146	A11-5771	111 SE 6TH ST	51	T-R	6.0	258	Y	8	6	Y		Unable to access Likely abandoned-Dry and full of sand-No action needed because recommending cap-a-connection at main	Install Cap-A-Connection	No Action needed						1					
375	Asphalt / 5	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	109	R	6.0	258	Y	8	6	Y	2	Tophat lined up to 1 ft Double wye @ 1.9 ft 3 o'c and 9 o'c	Remove Top Hat	Install Cap-A-Connection						1			1		
376	Asphalt /	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	109	R-R	6.0	284	Y	8	6	Y	16	Deposits settled Dry pipe-likely abandoned		No Action needed												
377		A11	A11-5769	2146	A11-5771		109	R-L	6.0	284	Y	8	6	Y		Likely abandoned		No Action needed												
378	Concrete / Sidewalk / 5	A11	A11-5769	2146	A11-5771	110 SE 6TH ST	176	T-L	6.0	258	Y	8	6	T	30	Tophat lined up to 1.3 ft Deposits seettled fine-Infiltration stain CAPPED	Remove Top Hat	Install Cap-A-Connection						1			1		
379	Asphalt / 4	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	188	T-R	6.0	258	Y	8	6	T	18	Tophat lined up to 1 ft Deposits settled fine Full of sand-CANNOT PASS Likely abandoned	Remove Top Hat	Install Cap-A-Connection						1			1		
380	Asphalt / 4.3	A11	A11-5769	2146	A11-5771	201 SE 6TH ST	200	T-R	6.0	258	Y	8	6	T	22	Tophat lined up to 1 ft Infiltraion dripper-Deposits settled CANNOT PASS-Likely abandoned. Inspect before capping.	Remove Top Hat	Install Cap-A-Connection						1			1		
381	Concrete / Sidewalk / 4.3	A11	A11-5768	2145	A11-5769	216 SE 6TH ST	17	L	6.0	284	N	8	6	Y	27	Deposits settled compacted Broken @ 19 ft Possible point repair to fix broken pipe-Pipe possibly abandoned	Don't Reinstate	Don't Reinstate												
382	Concrete / Sidewalk / 3.5	A11	A11-5768	2145	A11-5769	216 SE 6TH ST	73	T-L	6.0	284	N	8	6	T	26	Deposits settled fine full of sand-likely abandoned	Don't Reinstate	Don't Reinstate												
383		A11	A11-5768	2145	A11-5769	208 SE 6TH ST	82	T-L	6.0	284	N	8	6	T	27	Infiltration stain-Sag in pipe @ 16 ft-Joint offset medium		Install T-Liner			1		12							

							Main						Lateral																	
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y or T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
384	Concrete / Sidewalk / 5	A11	A11-5768	2145	A11-5769	201 SE 6TH ST	148	T-R	6.0	284	N	8	6	T	44	CAPPED	Don't Reinstate	Don't Reinstate												
385		A11	A11-5768	2145	A11-5769	202 SE 6TH ST	150	T-R	6.0	284	N	8	6	T	12	Infiltration weeper Sag in pipe Deposits settled compacted Tuberculation-CANNOT CONTINUE		Dye Test	1											
386	Concrete / Sidewalk / 4.3	A11	A11-5768	2145	A11-5769	200 SE 6TH ST	203	T	6.0	284	N	8	6	T	26	Clay-Not lined		Install T-Liner			1			11						
387	Grass / Dirt / Gravel / 5	A11	A11-5768	2145	A11-5769	201 SE 6TH ST	260	R	6.0	284	N	8	6	Y	45	Deposits settled fine Obstacles thru connection Point of Repair to fix Hole @ 26 ft Sag in pipe		Point of Repair											1	
388		A11	A11-5768	2145	A11-5769	201 SE 6TH ST	271	R	6.0	284	N	8	6	Y	1	Wye @ 3 o'clock cannot access-sand Wye @ 9 o'clock-cannot access due to heavy deposit CANNOT ACCESS-Likely abandoned	Don't Reinstate	Don't Reinstate											
389	Asphalt / 2.5	A11	A11-10584	10768	A11-10585	PARKING LOT/612 S ANDREWS AVE	228	L	10.8	313	N	10	4	Y	42	PVC Sand and broken shells		No Action needed											
391	Asphalt / 4.3	A11	A11-5864B	2181	A11-5868	504 SE 7 ST	7	L	9.8	185	Y	18	6	T	9	Joint offset medium @ 4 ft Deposits settled fine 25% Possibly capped. Inspect before capping.	Install Cap-A-Connection	Install Cap-A-Connection	1								1			
392		A11	A11-5864B	2181	A11-5868	409 SE 7 ST	81	R	9.8	185	Y	18	6	T	8	Deposits settled fine Possibly capped. Inspect before capping	Install Cap-A-Connection	Install Cap-A-Connection	1								1			
393	Concrete / Sidewalk / 4.3	A11	A11-5864B	2181	A11-5868	500 SE 7 ST	102	L	9.8	185	Y	18	6	T	24	Joint offeset medium at 3 ft CAPPED	Install Cap-A-Connection	Install Cap-A-Connection									1			
394	Asphalt / 6	A11	A11-5864B	2181	A11-5868	409 SE 7 ST	123	R	9.8	185	Y	18	6	T	3	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection									1			
395	Asphalt / 6	A11	A11-5864A	2181	A11-5864B	504 SE 7 ST	58	L	9.5	185	Y	18	6	T	3	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection									1			
396	Asphalt / 5.7	A11	A11-5864A	2181	A11-5864B	504 SE 7 ST	97	L	9.5	185	Y	18	6	T	3	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection									1			
397	Asphalt / 4.11	A11	A11-5864A	2181	A11-5864B	504 SE 7 ST	103	L	9.5	185	Y	18	6	T	9	Deposits settled fine 95% Obstacles inuding through wall COLLAPSE PIPE @ 9 FT POINT OF REPAIR Verify if active		Point of Repair											1	
398	Asphalt / 5.5	A11	A11-5864A	2181	A11-5864B	504 SE 7 ST	139	L	9.5	185	Y	18	6	T	3	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection									1			
399	Concrete / Sidewalk / 6.6	A11	A11-5644	2142	A11-5700	501 S FEDERAL HWY	17	R	6.6	361	N	8	6	Y	1	Roots fine lateral Deposits settled fine 80% Cannot pass due to heavy roots and rocks-Likely abandoned	Don't Reinstate	Don't Reinstate												
400	Grass / Dirt / Gravel / 5.7	A11	A11-5644	2142	A11-5700	PARKING LOT S FEDERAL HWY	70	R	6.6	361	N	8	6	Y	8	Roots fine joint/lateral CAPPED	Install Cap-A-Connection	Install Cap-A-Connection							1					
401	Grass / Dirt / Gravel / 3	A11	A11-5644	2142	A11-5700	PARKING LOT S FEDERAL HWY	124	T-R	6.6	361	N	8	6	T	9	Wye @ 3o'clock Roots tap/fine lateral Deposits settled fine 80% Cannot pass due to heavy roots and sand-Likely abandoned	Don't Reinstate	Don't Reinstate												
402	Grass / Dirt / Gravel / 2.5	A11	A11-5644	2142	A11-5700	PARKING LOT S FEDERAL HWY	178	T-R	6.6	361	N	8	6	T	8	Wye @ 3o'clock CAPPED Roots fine lateral CAPPED	Install Cap-A-Connection	Install Cap-A-Connection							1					
403	Grass / Dirt / Gravel / 3.9	A11	A11-5644	2142	A11-5700	PARKING LOT S FEDERAL HWY	231	T-R	6.6	361	N	8	6	T	8	Wye @ 3o'clock CAPPED Roots fine lateral CAPPED	Install Cap-A-Connection	Install Cap-A-Connection							1					
404	Grass / Dirt / Gravel / 4	A11	A11-5644	2142	A11-5700	PARKING LOT S FEDERAL HWY	254	T-R	6.6	361	N	8	6	T	9	Wye @ 3o'clock Roots fine lateral CAPPED	Install Cap-A-Connection	Install Cap-A-Connection							1					
405	Concrete / Sidewalk / 5.2	A11	A11-5644	2142	A11-5700	520 SE 5 AVE	332	T-R	6.6	361	N	8	6	T	4	Wye @ 3o'clock Deposits settled fine Cannot get through due to heavy deposits-Likely abandoned	Don't Reinstate	Don't Reinstate												
418	Asphalt / 2.8	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	23	R	6.8	273	Y	8	6	T	16	Cast iron Pipe is dry - no sign of activity Full of sand cannot go further Abandonded	Install Cap-A-Connection	Install Cap-A-Connection							1					
419	Asphalt / 2.8	A11	A11-5814	2124	A11-5815	633 SE 6 CT	35	L	6.8	273	Y	8	6	T	13	circumferential crack @ connection Cast Iron		Install T-Liner			1								
420	Concrete / Sidewalk / 2.5	A11	A11-5814	2124	A11-5815	633 SE 6 CT	86	L	6.8	273	Y	8	6	T	21	Pipe is dry and full of sand No sign of activity Cannot pass deposits	Install Cap-A-Connection	Install Cap-A-Connection							1					
421	Asphalt / 3.3	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	105	L-R	6.8	273	Y	8	6	T	19	Cast iron Deposits settled-cannot pass Likely abandoned	Install Cap-A-Connection	Install Cap-A-Connection							1					

							Main						Lateral																
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y or T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
422	Asphalt / 3.2	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	105	L-L	6.8	273	Y	8	6	T	4	Cast iron Deposits settled-cannot pass Likely abandoned	Install Cap-A-Connection	Install Cap-A-Connection							1					
423	Asphalt / 2.6	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	125	R	6.8	273	Y	8	6	T	27	Cast iron Leads to parking lot	Install Cap-A-Connection	Install Cap-A-Connection							1					
424	Concrete / Sidewalk / 2.3	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	167	L	6.8	273	Y	8	6	T	15	Cast iron Leads to parking lot	Install Cap-A-Connection	Install Cap-A-Connection							1					
425	Asphalt /	A11	A11-5814	2124	A11-5815	PARKING LOT SE 6TH CT	215	L	6.8	273	Y	8	6	T	2	Cast iron Full of deposits CANNOT ACCESS Appears to be abandoned.	Install Cap-A-Connection	Install Cap-A-Connection							1					
426	Asphalt /	A11	A11-5815	2125	A11-5818	116 SE 6TH CT	6	L	8.0	279	Y	8	6	T	1	Cast iron Full of deposits CANNOT ACCESS-Appears to be abandoned	Install Cap-A-Connection	Install Cap-A-Connection							1					
427		A11	A11-5815	2125	A11-5818	110 SE 6 ST (Garage)	9	R	11.0	279	Y	8	6	Y	27	Weld failure circumferential-Infiltration stain-Deposits settled fine-Sag in pipe		Install T-Liner			1			12						
428	Asphalt / 4.2	A11	A11-5815	2125	A11-5818	116 SE 6 CT/ Parking Lot	54	L	11.0	279	Y	8	6	Y	13	Cast Iron Test tee @ 12 o'clock No signs of activity	Install Cap-A-Connection	Install Cap-A-Connection							1					
429	Asphalt / 5.2	A11	A11-5815	2125	A11-5818	110 SE 6 ST (Garage)	55	T	11.0	279	Y	8	6	T	10	Deposits attached encrustation-Tuberculation Cannot pass due to blockage No signs of activity	Install Cap-A-Connection	Install Cap-A-Connection							1					
430	Asphalt / 6.7	A11	A11-5815	2125	A11-5818	110 SE 6 ST (Garage)	56	R	11.0	279	Y	8	4	Y	1	Cannot access 85% blocked Possible abandoned	Install Cap-A-Connection	Install Cap-A-Connection							1					
431	Asphalt / 6.7	A11	A11-5815	2125	A11-5818	110 SE 6 ST (Garage)	167	R	11.0	279	Y	8	4	Y	1	Cannot access 85% blocked Possible abandoned	Install Cap-A-Connection	Install Cap-A-Connection							1					
432		A11	A11-5815	2125	A11-5818	110 SE 6 ST (Garage)	176	R	11.0	279	Y	8	6	Y	24	Infiltration stain-Sag in pipe-Deposits settled fine-Weld failure circumferential Cannot pass due to heavy sand		Install T-Liner			1			9						
433		A11	A11-5815	2125	A11-5818	SE 6 ST (Drop)	277	D	11.0	279	Y	8	8	T	4	Drop Connection No visible defects		Install T-Liner					1								
434	Concrete / Sidewalk / 5.8	A11	A11-5761	2132	A11-5811	604 S FEDERAL HWY	92	T-L	8.0	305	Y	10	6	T	39	Tophat liner Wye @ 9o'clock Cannot pass through cast iron	Remove Top Hat	Install T-Liner			1			24				1		
435	Concrete / Sidewalk / 4	A11	A11-5761	2132	A11-5811	611 S FEDERAL HWY	137	T-R	8.0	305	Y	10	6	T	20	Tophat liner Cast Iron Transition 6" to 4"	Remove Top Hat	Install T-Liner			1			5				1		
436	Asphalt / 5.2	A11	A11-5761	2132	A11-5811	611/621 S FEDERAL HWY (PARKING LOT)	169	T-R	8.0	305	Y	10	6	T	6	Tophat liner Deposits settled fine Possibly abandonded	Remove Top Hat	Install Cap-A-Connection								1		1		
437	Asphalt / 4.4	A11	A11-5761	2132	A11-5811	621 S FEDERAL HWY	238	T-R	8.0	305	Y	10	6	T	6	Tophat liner CAPPED	Remove Top Hat	Install Cap-A-Connection								1		1		
438	Concrete / Sidewalk / 5.1	A11	A11-5761	2132	A11-5811	621 S FEDERAL HWY	289	T-R	8.0	305	Y	10	6	T	22	Tophat liner Roots fine joint	Remove Top Hat	Install T-Liner			1			7				1		
439	Asphalt / 5.1	A11	A11-5811	2133	A11-5860	633 S FEDERAL HWY	8	T-R	8.7	305	Y	10	6	T	10	Tophat liner-Lined up to 0.6 ft Deposits settled fine Likely abandoned	Remove Top Hat	Install Cap-A-Connection								1		1		
440	Asphalt	A11	A11-5811	2133	A11-5860	633 S FEDERAL HWY	50	T-R	8.7	305	Y	10	6	T	29	Tophat liner-Lined up to 0.9 ft Cast iron @ 16 ft Test Tee @ 17 ft and 24 ft Dye tested postive from CO	Remove Top Hat	Install T-Liner			1			14				1		
441	Concrete / Sidewalk / 4.2	A11	A11-5811	2133	A11-5860	PARKING LOT/ 633 S FEDERAL HWY	125	T-R	8.7	305	Y	10	6	T	17	Tophat liner-Lined up to 0.9 ft Tuberculated cast iron Deposits settled Unknown object @ 16 ft No sign of activity-Likely abandoned	Remove Top Hat	Install Cap-A-Connection								1		1		
442	Asphalt / 4.7	A11	A11-5811	2133	A11-5860	PARKING LOT/ 633 S FEDERAL HWY	176	T-R	8.7	305	Y	10	6	T	20	Tophat-Lined up to 2.6 ft Longitudinal fracture Clay to cast iron @ 11 ft Test tee @ 16 ft CAPPED	Remove Top Hat	Install Cap-A-Connection								1		1		
443	Asphalt / 4.5	A11	A11-5811	2133	A11-5860	PARKING LOT/ 633 S FEDERAL HWY	215	T-R	8.7	305	Y	10	6	T	3	Tophat-Lined up to 0.9 ft Longitudinal fracture-Collapsed pipe @ 3 ft blocking 50% Leads to parking lot-Verify if active If inactive install cap-a-connection	Remove Top Hat	Install Cap-A-Connection								1		1	1	
444	Concrete / Sidewalk / 4	A11	A11-5811	2133	A11-5860	PARKING LOT/ 633 S FEDERAL HWY	265	T-R	8.7	305	Y	10	6	T	17	Tophat-Lined up to 2.6 ft Full of sand from 4-7 ft Deposits settled-Likely abandoned	Remove Top Hat	Install Cap-A-Connection								1		1		

							Main						Lateral																
No.	Cleanout area	PS#	USMH	MAIN ID #	DSMH	Address	Loc.		Main depth (ft)	Main Length (ft)	Lined (Y/N)	Size (in)	Size (in)	Y or T	Lateral Length (ft)	Comments	Main to Lateral Recommendations	Lateral Recommendations	Sewer lateral TV inspection from main up to 30 feet (EA)(Item 63)	Sewer lateral TV inspection (beyond 30 feet)	CIPP Lateral Lining. 6 to 10-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 48)	CIPP Lateral Lining. 12-inch full circle main connection 4 to 6-inch x 4.5 mm lateral (T-Liner) (EA) (Item 49)	CIPP Lateral Lining 6 to 12-inch full circle mainline to lateral for a drop connection, 6 to 10-inch x 4.5mm drop pipe (T-Liner). (EA) (Item 59)	CIPP Lateral Lining. Lateral liner 4 or 6-inch x 4.5 mm beyond 15-feet, all mainline sizes (LF) (Item58)	Install Cured-in-Place Cap-A-Connection liner. 8-inch x 3.0 mm (EA)(Item 139)	Install Cured-in-Place Cap-A-Connection liner. 10-inch x 4.5 mm (EA)(Item 140)	Install Cured-in-Place Cap-A-Connection liner. 18-inch x 6.0 mm (EA)(Item 143)	Cut and remove defective brim liner - Top Hat (EA)(Item 23)	Point repair lateral 3 to 6 inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 78)	Replacement of exisiting Double Wye. Doble service connection replacement 3 to 6-inch pipe, over 6-foot depth up to 10-foot depth. (EA) (Item 119)
445	Concrete / Sidewalk / 9	A11	A11-5813	2123	A11-5872	633 SE 3 AVE	81	T	11.0	307	N	10	6	T	3	Intruding sealing other 30% CAPPED	Don't Reinstate	Don't Reinstate											
446	Asphalt / 4.7	A11	A11-5813	2123	A11-5872	PARKING LOT/ 633 SE 3 AVE	131	T-R	11.0	307	N	10	6	T	22	Wye @ 9o'clock Joint offset medium	Don't Reinstate	Don't Reinstate											
447	Asphalt	A11	A11-5813	2123	A11-5872	SE 3 AVE Parking lot	156	T	11.0	307	N	10	6	T	35	Full of sand	Don't Reinstate	Don't Reinstate											
448	Concrete / Sidewalk / 2.7	A11	A11-5813	2123	A11-5872	PARKING LOT/ 633 SE 3 AVE	188	T-R	11.0	307	N	10	6	T	44	Broken soil visible @ 17 ft Deposit settled fine	Don't Reinstate	Don't Reinstate											
449	Asphalt / 4.2	A11	A11-5813	2123	A11-5872	PARKING LOT/ 650 SE 3 AVE	217	T-L	11.0	307	N	10	6	T	31	Infiltration dripper Deposits settled fine Cast Iron Cannot pass unknown object @ 31 ft?	Don't Reinstate	Don't Reinstate											
450	Grass / Dirt / Gravel / 3.7	A11	A11-5813	2123	A11-5872	Parking Lot /SE 3 AVE	231	T-R	11.0	307	N	10	6		42	Joint offset medium Deposits settled fine Test Tee @ 12 o'clock	Don't Reinstate	Don't Reinstate											
451	Asphalt	A11	A11-5813	2123	A11-5872	PARKING LOT/ 633 SE 3 AVE	237	T	11.0	307	N	10	6	T	4	CAPPED	Install Cap-A-Connection	Install Cap-A-Connection								1			
452		A11	A11-5767	2122	A11-5813	600 SE 3 AVE	122	T	13.0	320	N	10	6	T	0	Tuberculated cast iron		Dye Test	1										
453	Concrete / Sidewalk / 5.9	A11	A11-5767	2122	A11-5813	600 SE 3 AVE	145	L	13.0	320	N	10	8	Y	41	cast iron connection PVC Dye tested from cleanout positive		Install Shorty			1								
454	Asphalt / 3.7	A11	A11-5767	2122	A11-5813	601 SE 3 AVE / PARKING LOT	200	T-R	13.0	320	N	10	6	T	32	Tuberculated cast iron Poor visibilty	Don't Reinstate	Don't Reinstate											
455	Asphalt / 3.6	A11	A11-5767	2122	A11-5813	PARKING LOT/ SE 3 AVE	256	T-R	13.0	320	N	10	6	T	23	Tuberculated cast iron Poor visibilty CAPPED	Don't Reinstate	Don't Reinstate											
456	Grass / Dirt / Gravel / 2.2	A11	A11-5869	2202	A11-5823	15 SW 7 ST	14	L	3.0	253	N	8	4	T	18	Tuberculated cast iron Dry pipe-no sign of activity	Don't Reinstate	Don't Reinstate											
457	Grass / Dirt / Gravel / 3	A11	A11-5869	2202	A11-5823	635 Andrew Ave/ Empty Lot	17	T-R	4.8	253	N	8	4	T	30	Tuberculated cast iron Dry pipe-no sign of activity	Don't Reinstate	Don't Reinstate											
458	Asphalt / 2.5	A11	A11-5869	2202	A11-5823	Andrew AlleyWay/ Parking Lot	50	L	3.0	253	N	8	6	Y	12	Full of sand Abandoned	Don't Reinstate	Don't Reinstate											
459	Asphalt / 3.1	A11	A11-5869	2202	A11-5823	635 ANDREW AVE	54	R	3.0	253	N	8	6	T	1	CAPPED	Don't Reinstate	Don't Reinstate											
460	Asphalt / 3.1	A11	A11-5869	2202	A11-5823	635 Andrew Ave	103	R	3.0	253	N	8	6	T	4	Deposits settled Rocks-Appears to be abandoned	Don't Reinstate	Don't Reinstate											
461	Asphalt / 3.1	A11	A11-5869	2202	A11-5823	635 Andrew Ave	143	R	4.8	253	N	8	6	T	5	marked s/l	Don't Reinstate	Don't Reinstate											