To: All Plan Holders of Record

From: Verdantas LLC
For the Owner

Re: ***Addendum No. 1***
Larimar Culvert Improvements
City of Willowick, OH

Date: October 29, 2026

This Addendum forms a part of the contract documents and modifies the original bidding documents dated October 2026 and all previous addenda, if any. Acknowledge receipt of this addendum in the space provided in the bid forms. Failure to do so may subject the bidder to disqualification.

QUESTIONS AND ANSWERS

Q1. Would Geocast, Shotcrete, or Cemtec be an acceptable alternative liner in lieu of 120" Spray Geopolymer?

A1. Geocast and Cemtec are an approved equivalent but Shotcrete is not.

BID DOCUMENTS

Replace Prices to Include, Pages BD.10 to BD.12, with the enclosed Prices to Include, Pages BD.10A to BD.12A.

SPECIFICATIONS

Replace Specification Section 330130.73 - SPRAY APPLIED PIPE LINING (SAPL) with the enclosed Revision dated 10/28/2026.

PLANS

Replace plan sheet 3/15 with the enclosed Revised plan sheet 3/15.
Replace plan sheet 8/15 with the enclosed Revised plan sheet 8/15.

TM/JB:mep

Enclosures

Z:\Project Files\WA-XZ\Willowick\43427 - Larimar Culvert Improvements\Working\Bid Documents\Addenda\Addendum 01\Addendum 01.Doc

PART 2 - ITEMS

All work proposed by this contract shall be quantified and paid for in accordance with the pertinent O.D.O.T. specification except as specifically altered by other provisions of this contract. No slag or recycled materials, including recycled asphalt products (RAP) are permitted for use for any aspect of this project.

2.1 (SPC) PRECONSTRUCTION VIDEOTAPE DOCUMENTATION

Basis of Payment

The lump sum price shall include all costs associated with hiring a professional videotaping firm to document in detail the existing conditions of the entire work area and potential disturbed areas and submitting a high quality USB flash drive with audio commentary and video log. The unit price shall also include mobilization, setup, and accurately measuring the location of, DVDs or USB drives with mp4 files, logs, and the furnishing of all labor, material, tools and appurtenances necessary to complete the work as specified or as shown. DVDs and logs shall be turned over to the Owner prior to payment for this item.

2.2 (SPC) BONDS AND INSURANCES, AS PER PLAN

Basis of Payment

A "Bonds and Insurances" item (including "Owner/Contractor Protective Policy," "All Risk Builder's Risk Insurance," and/or "Installation Floater Insurance", and/or endorsements to fully comply with all contract requirements) has been included in the bid proposal.

2.3 (201) CLEARING AND GRUBBING, AS PER PLAN

Basis of Payment

This pay item is for the entire work area along any of the proposed sewer line work and pump stations. The lump sum price shall include all labor, equipment, tools, and materials including but not limited to removal and disposal of all vegetation, and removal and stockpiling of topsoil within the work limits, and/or disposal of topsoil as may be necessary, and restoration of all areas disturbed by the work to pre-construction conditions or better in accordance with plan details and specifications, if any. Payment shall be made progressively throughout the contract period in proportion to the percentage of work complete or as otherwise approved by the Engineer.

2.4 (603) 120 INCH SPRAY-IN-PLACE PIPE LINING, AS PER PLAN

Method of Measurement

The method of measurement shall be the linear length (in feet) of existing storm sewer that receives application of spray lining, as indicated in the plans and specifications. This pay item is for a 120" storm sewer that has noted variations in height to width ratio. Any variation, whether less or greater in total perimeter or shape of each cross section of sewer, shall not have any modification in price and the Contractor shall account for the variations when determining their unit cost.

Basis of Payment

The unit price shall be irrespective of the depth of sewer and if not called out as a separate pay item shall include the; preparatory cleaning of the sewer and flow control; field verification of existing sewer to confirm repair extents and methods of installation; removal of any debris or materials necessary to properly install liner system, corrugation filling and surface preparation of the host pipe, joint sealing or injections, patch repairs, all pumping required for adequate handling of flow bypassing, underground water and/or surface water; pre and post construction CCTV in accordance with NASSCO PACP; and the furnishing of all labor, materials, tools and appurtenances necessary to complete the work as specified or as shown. All incidental repairs, rehabilitation activities, obstruction removal, defect remediation, and any other corrective measures determined necessary by the Contractor or Engineer to facilitate and successfully complete the rehabilitation.

2.5 (603) 84 INCH SLIP LINING, AS PER PLAN

Method of Measurement

The quantity to be paid shall be the number of linear feet installed per the specifications. This pay item is for an 84" storm sewer that has noted variations in height to width ratio. Any variation, whether less or greater in total perimeter or shape of each cross section of sewer, shall not have any modification in price and the Contractor shall account for the variations when determining their unit cost.

Basis of Payment

The unit prices for the various thicknesses of liner pipe shall include sewer cleaning, measurements of existing pipe size and length to verify plan notes, determination of live connections, flow control not included in other pay items, all liner system materials (including but not limited to liner pipe, grout, spacers, and any material necessary to install system according to manufacturer specifications), installation, curing, testing, pre and post construction CCTV in accordance with NASSCO PACP, cleanup, restoration, and the furnishing of all labor, material, tools and appurtenances necessary to complete the work in accordance with these specifications, the manufacturer's recommendations, or as shown.

The minimum thickness of the liner material shall be as specified. The unit price shall further include all work necessary to facilitate and complete the slip lining operation, including but not limited to furnishing and installing replacement liner pipe segments, jointing and connection of liner pipe sections, dewatering, maintenance of bypass pumping systems, corrugation filling, annular space grouting, bulkheads, seals, end treatments, pipe replacement, connections to existing structures/pipes, incidental repairs, localized rehabilitation, defect remediation, obstruction removal, infiltration control, restoration, and all other work required to achieve a complete and fully functional slip lined sewer installation.

2.6 MANHOLE TEE WITH ACCESS RISER AND REINFORCEMENT, AS PER PLAN

Method of Measurement

The method of measurement shall be the number of each structure installed per the Manhole Tee with Access Riser & Reinforcement Installation Detail in the plans.

Basis of Payment

The unit price stipulated in the Proposal for the work specified shall be irrespective of depth of the structures and if not called out as a separate pay item, shall be full compensation for earth and/or rock excavation for the structure and foundation; removal of all spoils as necessary to an appropriate disposal facility, furnishing and placing granular or concrete bedding and special backfill as required; testing of compaction; construction of access shaft for slip lining work; sheeting, shoring, and all trenching work necessary to construction access shaft and install manhole riser; furnishing, installing and operating necessary pumps, pipes and appurtenances necessary for flow bypassing and/or trench dewatering; sealing or banding all joints where required; verification and protection of all existing utilities, i.e., gas mains, gas connections, water mains (including hydrants and their connections to the main), water connections, sanitary sewers, sanitary connections, storm sewers, storm connections if damaged by the Contractor; tee; riser; collars; frame and lid; transition materials; gaskets; joining of riser to proposed fitting; leakage testing; disposal of all surplus and unsuitable materials; restoration of all areas disturbed by the work to pre-construction condition or better, and the furnishing of all labor, tools, materials and equipment necessary to complete the work as specified or as shown.

2.7 CONTINGENCY / DISCRETIONARY ALLOWANCE

Basis of Payment

A Contingency/Discretionary Allowance has been included in the bid proposal to be utilized as directed by the Engineer for unscheduled work items not included on the proposal forms or other changes in the work. Any portion of the allowance not utilized shall be credited to the Owner.

SECTION 330130.73 – SPRAY APPLIED PIPE LINING (SAPL)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Other Sections Referenced:
   1. Section 330130.01 - Sewer Collection System Rehabilitation Definitions
   2. Section 330130.03 - Sewer Flow Control
   3. Section 330130.17 - Television Inspection

1.2 REFERENCES

A. ASCE Manual of Practice No. 145 – Design of Close -Fit Liners for Rehabilitation of Gravity Pipes

B. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field

C. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens

D. ASTM C78 – Flexural Strength of Concrete

E. ASTM C109 – Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens)

F. ASTM C469 – Static Modulus of Elasticity & Poisson's Ratio of Concrete Compression

G. ASTM C496 – Splitting Tensile Strength of Cylindrical Concrete Specimens

H. ASTM C666 – Freeze Thaw Durability

I. ASTM C807 – Set Time of Hydraulic Cement Mortar

J. ASTM C 868 – Standard Test Method for Chemical Resistance of Protective Linings

K. ASTM C882 – Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear

L. ASTM C1090 – Shrinkage Test

M. ASTM C1138 - Standard Test Method for Abrasion Resistance of Concrete (Underwater Method)

N. ASTM C 1583/1583M – Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method

O. ASTM C1898 – Standard Test Methods for Determining the Chemical Resistance of Concrete Products to Acid Attack

P. ASTM C1904 – Standard Test Methods for Determination of the Effects of Biogenic Acidification on Concrete Antimicrobial Additives and/or Concrete Products

Q. ASTM D7682 – Standard Test Method for Replication and Measurement of Concrete Surface Profiles Using Replica Putty

R. ASTM F2304 – Standard Practice for Rehabilitation of Sewers Using Chemical Grouting

S. ASTM F2414 – Practice for Sealing Sewer Manhole Using Chemical Grouting

T. NACE SP0188 – Standard Practice for Discontinuity (Holiday) Testing of Protective Linings

U. NACE No. 6/SSPC-SP13 – Surface Preparation of Concrete

V. OSHA Safety and health Standards (29 CFR 1910/1926)

W. SSPC-SP13/NACE No. 6 – Surface Preparation of Concrete

X. SSPC-Guide 12 – Guide for Illumination of Industrial Painting Projects

1.3 DESCRIPTION OF WORK

A. The product furnished shall be a complete spray-applied-pipe-liner (SAPL) system including materials, equipment, and installation procedures. Submitted SAPL products for consideration shall be required to meet the submittal requirements as contained herein.

B. The Contractor shall provide materials, labor, equipment, and design services necessary for traffic control (if required), bypass pumping and/or diversion of flows, cleaning, measurement and television inspection of sewers to be rehabilitated, SAPL installation, reconnection of service connections, quality controls, provide samples for performance of required material tests, final television inspection, testing of the rehabilitated pipe system, warranty work and other work, as specified herein.

C. The intent of SAPL is to rehabilitate sewer lines by installing structural cementitious or geopolymer mortar spray-applied liner which, once cured, shall be continuous and tight-fitting in a constrained condition with a shear interface with the host throughout the entire length of the original pipeline. The SAPL shall extend the full length of the original pipeline and provide a structurally sound, jointless rehabilitation-solution with no annular space and permanent adhesion between the SAPL and the original pipeline (host pipe). Epoxy, polyurea, polyurethane, resin-impregnated tube, cured-in-place, and any other polymer-based lining system shall not be accepted as the structural liner material. The Contractor is responsible for proper, accurate and complete installation of the SAPL using the system selected by the Contractor meeting the Owners requirements and these specifications. Deficiencies which will be corrected by the finished product include:

1. Cracked and broken pipe caused by poor construction, unstable soil, earth movement, infiltration, roots, destructive loadings, cleaning tool damage, etc.
2. Corrosion of pipe caused by acid attack above the flow line.
3. Erosion of pipe caused by abrasion below the flow level.
4. Degradation of brick pipe caused by loss of masonry.
5. Infiltration of groundwater and soil through leaking pipe joints and structural defects.
6. Exfiltration of transported fluid through leaking pipe joints and structural defects.
7. Inflow of surface water and infiltration of groundwater through unused or illegal connections.

D. The SAPL system shall be designed for a life of 50 years or greater and an equal service life unless specifically specified otherwise by the Owner.

E. The installed SAPL system shall withstand all applicable surcharge loads (soil overburden, live loads, etc.) and external hydrostatic (groundwater) pressure, if present, for each specific installation location.

F. The installed SAPL system shall have a long term (50 year or greater) corrosion resistance to the typical chemicals found in stormwater runoff and defined in the referenced and applicable ASTM standards.

G. Neither the SAPL product, system, nor its installation, shall cause adverse effects to any of the Owner's processes or facilities. The installation pressure for the product shall not damage the system in any way. The Contractor shall notify the Owner and identify any by-products produced as a result of the installation operations, and test and monitor the levels. The Contractor shall cleanup, restore existing surface conditions and structures, and repair any of the SAPL system determined to be defective. The Contractor shall conduct installation operations and schedule cleanup in a manner to cause the least possible obstruction and inconvenience to traffic, pedestrians, businesses and property owners or tenants.

1.4 QUALITY ASSURANCE

A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for work.

B. Installer's Qualifications: Firms with at least 5 successfully completed projects having installed an aggregate total of 5,000 linear feet of the submitted manufacturer's SAPL.

C. Contractor shall submit a written plan with means and methods for installing specified SAPL system. Plan shall be called Performance Work Plan (PWP). This will be made available to the Engineer prior to approval of work and shall identify quality checks to be performed and installation crew qualifications.

D. The Contractor shall outline specific repair or replacement procedures for potential defects that may occur in the installed SAPL. Repair/replacement procedures shall be as recommended by the SAPL system manufacturer and shall be submitted as part of the PWP.

E. Defects in the installed SAPL that will not affect the operation and service life of the product shall be identified and defined.

1.5 SUBMITTALS

A. Comply with all provisions of Section 013323 – Shop Drawings and Submittals

B. Manufacturer-certified copies of all test reports on each product used, including:
   1. Test results indicating the product conforms to and is suitable for its intended use per these specifications. Test reports shall be performed at the Licensed Applicator's expense and shall be carried out by an approved independent third-party testing laboratory or by a reputable independent testing body. As a minimum, the test reports should include properties listed in Paragraph 2.5 of this specification.

C. Submit Material Safety Data Sheet(s) for the materials, any other chemical additives, and any other chemicals used in the SAPL system.

D. Minimum Thickness Calculations with approvable design calculations as required along with proposed plan for ensuring that the installed SAPL meets the minimum thickness. The finished liner thickness shall not be less than 2 inches measured from the crest of the existing corrugations.

1.6 SAFETY

A. The Contractor shall conform to all work safety requirements of pertinent regulatory agencies, and shall secure the site for the working conditions in compliance with the same. The Contractor shall erect such signs and other devices as are necessary for the safety of the work site.

B. The Contractor shall perform all of the work in accordance with applicable OSHA standards. Emphasis shall be placed upon the requirements for entering confined spaces and with the equipment being utilized for pipe renewal.

C. The Contractor shall submit a proposed Safety Plan to the Owner, prior to beginning any work, identifying all competent persons. The plan shall include a description of a daily safety program for the job site and all emergency procedures to be implemented in the event of a safety incident. All work shall be conducted in accordance with the Contractor's submitted Safety Plan.
   1. Safety plan shall include a notification of work flyer that will be distributed to all properties connected to the sewer that will be worked on. Notification shall include details of work, dates for expected installation of SAPL, and best measures for preventing dust control during material handling and mixing.

D. Compensation for all work required for the submittal of the Safety Plan shall be included in the various pipelining items contained in the bid proposal.

1.7 STORAGE OF MATERIALS

A. Deliver materials in original containers with seals unbroken and labels intact and free of moisture. Do not use materials that have been directly exposed to moisture or if there is visible damage to the packaging.

B. Project materials shall be inspected by the Contractor upon receipt and the Bill of Lading reviewed to confirm it properly documents amount(s) and type(s) of material(s) received, date and time of delivery as well as the shipping company delivering the material. Contractor shall log and make available for review Bill of Lading and material batch numbers upon receipt of the material(s). Receipt of material should also be noted in daily activity logs.

C. Materials may be stored offsite, such as in a yard, for a period prior to use on the project. Upon delivery to the project, Contractor shall designate a specific protected space at the project site for staging and mixing materials. Do not store kerosene, gasoline, or other flammable liquids in this space. Remove oily rags at the end of each day's work. Regardless of storage location, materials used for rehabilitation are to be kept dry, protected from weather, and stored under cover within the temperature ranges recommended by the Manufacturer. Products are to be stored and handled according to their SDSs or appropriate classification. Damaged or unsuitable products shall be promptly removed from the Project site and shall not be incorporated into the Work.

1.8 AS-BUILT DRAWINGS/RECORDS

A. Digital copies of As-Built drawings/records and pre & post inspection videotapes shall be submitted to the Owner via a USB or email, by the Contractor, within 2 weeks of final acceptance of said work or as specified by the Owner. As-Built drawings/records will include the identification of the work completed by the Contractor and shall be prepared on one set of Contract Drawings/Records provided to the Contractor at the onset of the project.

1.9 WARRANTY

A. The materials used for the project shall be certified by the manufacturer for the specified purpose. The Contractor shall warrant the SAPL material and installation for a period of one (1) year. During the Contractor warranty period, any defect which may materially affect the integrity, strength, function and/or operation of the pipe, shall be repaired at the Contractor's expense in accordance with procedures as recommended by the manufacturer.

B. After a pipe section has been rehabilitated and for a period of time up to one (1) year following completion of the project, the Owner may inspect all or portions of the rehabilitated system. The specific locations will be selected at random by the Owner's inspector and should include all sizes of SAPL from this project. If it is found that any of the SAPL has developed abnormalities since the time of "Post Construction Television Inspection," the abnormalities shall be repaired and/or replaced in accordance with plans, specifications, and Owner standards.

C. On any work completed by the contractor that is defective and/or has been repaired, the contractor shall warrant this work for (1) year in addition to the warranty required by the contract.

1.10 GENERAL

A. All equipment and material shall be of a type that has generally been in use for a period of five (5) years. Work performed with experimental equipment or material will not be permitted without prior written consent of the Owner.

PART 2 - MATERIALS

2.1 MATERIALS

A. The SAPL system must meet the physical performance requirements of these contract documents.

B. All materials used in the installation of SAPL system shall be equal to or exceed the manufacturer's standards.

C. Minimum Design Properties
   1. The Contractor shall provide a detailed calculation using the appropriate methods and standards to determine the thickness of the SAPL system so that it meets minimum design criteria listed below:
      1) All pipe shall be considered fully deteriorated.
      2) All pipe shall be subjected to soil loads of 120 pounds per cubic foot.
      3) All pipe shall be subject to AASHTO HS-20 highway loading.
      4) The water table shall be assumed to one foot (1 ft) above the top of pipe
      5) All pipe ovality values shall be as determined by the existing condition assessments provided in the contract documents.
      6) Creep Retention Factor 50%.
      7) Constrained Soil Modulus per AASHTO LRFD Section 12 and AWWA Manual M45.
      8) Minimum Service Life 50 years.
      9) Design Safety Factor of 2.0 (1.5 for pipes 36” or larger)

D. Minimum Thickness
   1. Design thickness for cementitious or geo liner shall at a minimum be the following unless otherwise specified on drawings or submitted by the Contractor and approved by the Engineer:

Diameter/Span of Pipe	Min. Liner Thickness
120 inch	2.0 inch

2. For corrugated host pipe materials, the minimum thickness shall be measured from the peaks/crests of the corrugation. The corrugations shall be filled to create a flush, smooth pipe surface.
3. If the minimum thickness exceeds that of the calculated thickness provided by the Contractor, the minimum thickness for shall govern as the design thickness for the SAPL system.
4. For design of thickness of liner, the Contractor shall utilize ASCE MOP 145.

E. Physical Properties
1. The cured pipe material shall conform to the minimum structural standards as listed below. Evidence shall be presented to demonstrate that the long-term modulus of elasticity of the cured product is no less than fifty percent (50%) of the herein specified Modulus of Elasticity (Short-term).

CEMENTITIOUS AND GEOPOLYMER MINIMUM PHYSICAL PROPERTIES

Cured Pipe Material Test	Test Method	Performance Value
Compressive Strength	ASTM C39 /C-109	Min. 8,000 psi @ 28 days
Flexural Strength	ASTM C78/C-293	Min. 800 psi @ 28 days
Modulus of Elasticity	ASTM C469	Min. $3.9x10^6$ psi @ 28 days
Split Tensile Strength	ASTM C496	Min. 700 psi @ 28 days
Freeze Thaw Durability	ASTM C666	Max 0.5% loss @ 300 cycles
Bond Strength to Concrete	ASTM C882	Min. 2,500 psi @ 28 days
Shrinkage Test	ASTM C1090	Max 0.02% loss @ 28 days
Abrasion Resistance	ASTM C1138	Max 36.3 in^3 total vol. loss @ 6 cycles on 28-day sample
Chemical Resistance	ASTM D543	Manufacturer Certified

F. Approved SAPL system are listed below. Alternative products may be accepted if they are considered equivalent and meet or exceed the specifications detailed in this section.
1. Quadex Lining System with Geokrete Geopolymer by Vortex Companies
2. Geospray by Geotree
3. PERMACAST PL-8,000
4. Geocast
5. Cemtec
6. Approved Equivalent

PART 3 - EXECUTION

3.1 PREPARATORY PROCEDURES

A. The Contractor shall notify all homeowners on the manhole section to be lined forty-eight (48) hours in advance of the work to be done. The Contractor shall inform the homeowner of precautions necessary to prevent backup of sewage into the house. Notification shall include language that the work may extend beyond normal permitted working hours, if necessary to reinstate service laterals

B. The following preparatory procedures shall be adhered to unless otherwise approved by the Engineer:

1. Cleaning of Sewer Line: Before ordering liner materials for the project, the Contractor shall remove all internal debris from the pipeline that will interfere with the installation or adhesion of SAPL materials and the final product delivery of the SAPL materials, as required in these specifications, and shall accurately measure and document the exact size of the existing pipeline to be rehabilitated. Solid debris and deposits shall be removed from the system and disposed of properly by the Contractor. Moving material from manhole section to manhole section shall not be allowed. All debris, cleaning residue or other material loosened during cleaning shall be removed from the pipe. Material shall not be permitted to enter downstream channels. As applicable, the contractor shall either plug or install a flow bypass pumping system to properly clean the pipelines.

2. The Contractor shall provide equipment and methods suitable for the size, configuration, material, and condition of the pipe being cleaned. Equipment shall be capable of adequately cleaning and preparing the full host-pipe surface for SAPL installation. The Contractor shall be responsible for selecting equipment appropriate for the work and modifying cleaning methods as necessary to achieve the specified results without damaging the host pipe. The repair of any damage, caused by the cleaning equipment, shall be the responsibility of the Contractor. If the Contractor determines that continued cleaning may damage a severely deteriorated portion of the host pipe or paved concrete invert, the Contractor shall stop cleaning in the affected area and notify the Engineer. Cleaning shall not resume in the affected area without approval from the Engineer. The Owner will designate a site for the disposal of all debris removed from the Owner's sewer system as a direct result of the cleaning operation. Fees associated with disposal of all debris shall be included in the applicable SAPL bid item.

3. Cleaning and surface preparation shall extend over the full interior surface to receive SAPL, including the crown, sidewalls, corrugation crests and valleys, seams, joints, fasteners, and interfaces with the existing paved concrete invert. The existing paved concrete invert shall remain in place and shall not be removed or reconstructed as part of the SAPL Work. Loose, delaminated, or deteriorated portions of the paved concrete invert shall be removed only where approved by the Engineer. Cleaning operations shall not damage sound portions of the paved concrete invert designated to remain.

4. Inspection of Sewer Line: In accordance with the Television Inspection requirements, the Contractor shall televise the pipe with PACP certified personnel specially trained in locating breaks, obstacles, and service connections. The interior of the sewer line shall be carefully inspected to determine the location and extent of any structural

failures. The location of any conditions which may prevent proper installation of the SAPL shall be noted so that such conditions can be corrected.

5. The Contractor shall provide the Owner and Engineer with digital copies of the pre-cleaning and post-cleaning video and inspections logs for review prior to installation of the SAPL and for later reference by the Owner. The inspection records shall identify remaining defects, areas of deteriorated material, limits of the paved concrete invert, and the locations requiring repair prior to lining. If the post-cleaning inspection identifies surfaces that are unacceptable for SAPL installation, the Contractor shall perform additional cleaning and surface preparation at no additional cost to the Owner. If sediment, corrosion products, contamination, or other unacceptable conditions return before SAPL placement, the affected surfaces shall be recleaned.

6. Connections: While televising the mainline sewer, the Contractor shall accurately measure and record the locations and positions of service connections using a fiberglass or other tape approved by the Engineer. Additionally, the Contractor shall utilize the pan and tilt capabilities of the televising equipment to determine which connections are live (active) and which are not in use. If required by the Contract documents, each connection will be dye tested to determine whether the connection is live or abandoned.

7. Bypassing Sewage: The Contractor shall provide for the flow of existing mainline and service connection effluent around the section or sections of pipe designated for SAPL installation. With most small diameter pipelines, particularly on terminal sewers, plugging will be adequate but must be monitored on a regular basis to prevent backup of sewage into adjacent homes. Service connection effluent may be plugged only after proper notification to the affected residence and may not remain plugged overnight. Installation of the liner shall not begin until the Contractor has installed the required plugs or a sewage bypass system and all pumping facilities have been installed and tested under full operating conditions including the bypass of mainline and side sewer flows. Once the installation has begun, existing flows shall be maintained, until the resin/tube composite is fully cured, cooled down, full televised and the SAPL ends finished. The Contractor shall coordinate sewer bypass and flow interruptions with the Owner at least 14 days in advance and with the property owners and businesses at least 1 business day in advance. The pump and bypass lines shall be of adequate capacity and size to handle peak flows. The Contractor shall submit a detail of the bypass plan and design to the Owner before proceeding with any SAPL installation. Compensation for bypass pumping and all associated plans and approvals shall be at the price bid in the Proposal. All bypassing of flow shall be performed as specified under 330130.03 - SEWER FLOW CONTROL.

8. Line Obstructions: It shall be the responsibility of the Contractor to clear the line of obstructions such as solids, dropped joints, protruding service connections, or collapsed pipe that will prevent installation. If the obstruction(s) could have been removed by bucket machines or by using conventional cleaning methods, no additional compensation will be granted.

    a. Internal repairs are protruding service connections, dropped portions of pipe which can be removed or pushed back in place, and other obstructions which

cannot be cleared using conventional cleaning methods, but which can be cleared from within the pipe. Such internal repairs shall be approved in writing by the Engineer prior to the commencement of the work and shall be included in the 120 Inch Spray Lining item.

b. Point repairs are obstructions that cannot be removed by either conventional sewer cleaning equipment or by internal equipment. The Contractor shall make an excavation to expose and remove or repair the obstruction. Such excavation shall be approved in writing by the Engineer prior to the commencement of the work, shall be performed as specified under Point Repairs, and shall be included in the 120 Inch Spray Lining item.

Patching shall be performed at locations where holes or soil are visible within the pipe, but the pipe is otherwise in a condition that it is able to have the SAPL system applied. The Contractor shall apply patching material that is able to properly fill any holes and voids, be smoothened to match the existing pipe surface once cured, and properly adhere to the SAPL. Such work shall be approved in writing by the Engineer prior to the commencement of the work and shall be specified under Patching or Joint Repair, and shall be included in the 120-Inch Spray Lining item.

9. Pre-Insertion Television Inspection: The Contractor shall televise and record the sewer pipe immediately before installing SAPL. This televising is to assure that the pipe is clean and that host-pipe surface, paved concrete invert, repairs, and existing pipe conditions are acceptable for lining. Should additional cleaning or surface preparation be required, it shall be provided at no additional cost to the Owner. The cost of this televising shall be included in the cost of SAPL.

3.2 INSTALLATION PROCEDURES

A. The liner shall be mixed, installed, and cured (as applicable) in the host pipe per the manufacturer's specifications as described and submitted in the PWP. For non-water based SAPL, materials shall be mixed (when applicable) with the SAPL manufacturer's recommendations component ratio, mix time, temperature, dispersion, and other requirements. Appropriate documentation shall be kept in a Daily Application Log throughout the installation process. The mixing and preparation operations must be performed so that the minimum amount of dust is released into the surrounding environment.

B. The SAPL installation shall be in accordance with the applicable ASTM/ACI standards and manufacturer's instructions.

C. The SAPL material may be spray applied and/or centrifugally spin-cast to the inside of an existing pipeline or structure depending on size of pipe and manufacturer application requirements. The necessary equipment and application methods to apply the liner materials shall be only as provided by the SAPL material manufacturer. Material shall be mixed in accordance with manufacturer's recommendations to proper consistency, then the materials

shall be pumped through a high-pressure material hose for delivery to the appropriate and / or selected application device.

3.3 FINISH

A. The installed SAPL shall be continuous over the entire length of a lined section (unless specified) and be free from visual defects such as foreign inclusions, infiltration) major surface profile deviation and delamination. The SAPL shall be impervious and free of any leakage through the SAPL wall.

B. Defects that affect the structural integrity or strength of the SAPL shall be repaired at the Contractor's expense in accordance with the procedures submitted under Section 1.4

C. Using the records from the pre-construction inspections, the Contractor shall ensure that connections are properly reinstated and service restored. Excess SAPL material at the connection shall be removed and disposed to an approved waste facility by the Contractor. The Contractor shall ensure that no infiltration is originating at the point of connection by sealing any leaks with appropriate product(s). The laterals and pipe connections shall then be completed by hand, applying the SAPL to the outer surface of the connection to the pipe and smoothly tapering it into the lateral or connecting pipe. No rough edges or abrupt transitions that could catch debris or hinder the flow shall remain.

D. Termination of the SAPL at the end of a pipe or manhole shall be completed by hand applying the SAPL to the outer surface of the pipe or into the interior of the manhole.

3.4 TESTING OF INSTALLED SAPL

A. The physical properties of the installed SAPL shall be verified through field sampling and laboratory testing. Mixed materials for testing shall be furnished by the Contractor to the testing laboratory for sample preparation at the job site, transport to the lab and testing. Sample preparation, transport and materials testing shall be performed at the Contractor's expense by an independent third-party laboratory selected by the Contractor as recommended by the SAPL manufacturer. All tests shall be in accordance with applicable ASTM test methods to confirm compliance with the requirements specified in these contract documents.

B. The Contractor shall provide mixed material samples from the actual installed SAPL for sample preparation to the testing laboratory. Samples shall be provided from the first and last day of installation and every 42,000 lbs | 19,050 kg of material during application of SAPL or as required by the Owner. The sample shall be collected from the mixer/hopper or if appropriate, the end of the application hose. Sample collection and testing hold times will be per manufacturer's recommendations.

C. For ASTM C39 Compressive samples, nine (9) four (4) by eight (8) inch | 100 x 200 mm test cylinders be prepared following ASTM C 31. Alternatively, ASTM C109 Compressive samples in the form of two (2) by two (2) by two (2) | 50 x 50 x 50 mm test cubes can be prepared. It is recommended that three (3) samples be tested at 7 days, three (3) at 28 days and three (3) retained as directed by the Contractor

D. The laboratory results shall identify the project, the test sample date, location as referenced to the nearest manhole and station, product batch and mix information. Final payment for the project shall be withheld pending receipt and approval of the test results. If properties tested do not meet the minimum physical and thickness requirements, the SAPL shall be repaired or replaced by the Contractor unless the actual physical properties and the thickness of the sample tested meet the design requirements as required in the contract.

E. The installed SAPL thickness shall be confirmed during application through the visual observation and monitoring of the permanent depth gauges and use of a handheld depth gauge by the installer. Pre- and Post-installation video should show the presence of the depth gauge (pre) and coverage of the depth gauge indicated by it no longer being visible (post).

F. Visual inspection of the installed SAPL lining for installation defect to include cracks, infiltration, surface texture and spray defects.

G. Adhesion testing shall be performed for SAPL systems that have been applied to steel or concrete host pipes. Testing shall be in accordance with ASTM D4541 or ASTM D7234 and performed based on manufacturer guidelines for quality assurance.

H. All costs to the Contractor associated with providing mixed SAPL material to an independent third-party testing laboratory for sample preparation, transport, curing and testing shall be included in the 120 Inch Spray Lining item.

3.5 FINAL ACCEPTANCE SAPL.

A. A visual inspection shall be made by Owner and Contractor periodically throughout the progression of construction, prior to the completion of a lining stage. Any deficiencies in the finished lining shall be marked and repaired by the Contractor according to the procedures set forth herein.

B. SAPL sample testing and repairs for the installed SAPL, as applicable, shall be completed before final acceptance, meeting the requirements of these specifications, and documented in written form.

C. The Contractor shall perform an internal pipe inspection per PACP requirements in the presence of the Engineer after installation of the SAPL and reconnection of the side sewers. Unedited digital documentation of the inspection shall be provided to the Owner within ten (10) working days of the SAPL installation acceptance.

D. Flow control from the upstream manhole shall be utilized to minimize sewage or stormwater from entering the line during the inspection. In the case of bellies in the line, the pipe shall be cleared of any standing water to provide continuous visibility during the inspection.

E. After the installation work has been completed and all testing acceptable, the Contractor shall clean up the entire project area. All excess material and debris not incorporated into the permanent installation shall be disposed of by the Contractor. Any leaks through the wall of the pipe shall be repaired.

END OF SECTION 330130.73

GENERAL:

1. THE CONTRACTOR SHALL PERFORM ALL OF THE WORK AND FURNISH ALL OF THE LABOR AND MATERIALS NECESSARY FOR THE FINAL COMPLETION OF THIS CONTRACT IN THE MANNER AND UNDER THE CONDITIONS HEREIN SPECIFIED AND PROVIDED AND IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

2. A PRE-CONSTRUCTION VIDEO TAPE OF THE PROJECT AREA WILL BE REQUIRED AND SUBMITTED TO THE ENGINEER BEFORE CONSTRUCTION BEGINS.

3. THE CONTRACTOR SHALL NOT COMMENCE ANY FORM OF CONSTRUCTION WITHOUT CONTACTING THE ENGINEER, AS APPROPRIATE, A MINIMUM OF 48 HOURS IN ADVANCE OF CONSTRUCTION ACTIVITY TO ARRANGE FOR OBSERVATION. IF ANY CHANGE IN THE WORK SCHEDULE BECOMES NECESSARY, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE ENGINEER TO AVOID UNNECESSARY OBSERVATION COSTS. IF NO NOTIFICATION IS MADE IN REGARDS TO CANCELLATION OF WORK, THE CONTRACTOR WILL BE CHARGED FOR THE TIME INCURRED.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN SAFE LOCAL ACCESS, VEHICULAR AND PEDESTRIAN, TO ALL PROPERTIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR WILL FURNISH, MAINTAIN AND SUBSEQUENTLY REMOVE ALL NECESSARY SAFEGUARDS SUCH AS BARRICADES, BARRIERS, TEMPORARY PAVEMENT, LIGHTING, FLAGGERS, SIGNING AND OTHER TRAFFIC CONTROLS TO INSURE THE SAFETY OF PERSONS AND VEHICLES DURING CONSTRUCTION WITHIN THE PROJECT LIMITS.

5. ACCESS TO ALL DRIVEWAYS WILL BE MAINTAINED AT ALL TIMES EXCEPT THE TIME WHEN SEWER INSTALLATION AND PAVEMENT REPLACEMENT WILL NOT PERMIT.

6. ALL SHOP DRAWINGS WILL BE SUBMITTED TO THE ENGINEER FOR PRELIMINARY CHECKING. THE ENGINEER SHALL FORWARD THE CHECKED SHOP DRAWINGS TO THE OWNER FOR FINAL CHECKING AND APPROVAL. SHOP DRAWINGS MUST BE APPROVED PRIOR TO ORDERING ANY MATERIALS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF ALL TESTING AND QUALITY CONTROL AS REQUIRED BY THE CONTRACT DOCUMENTS.

8. WHEN MAILBOXES, FENCES, NEWSPAPER BOXES OR STREET SIGNS AND SUPPORTS INTERFERE WITH CONSTRUCTION, THE CONTRACTOR SHALL REMOVE AND ERECT THEM IN A TEMPORARY LOCATION DURING CONSTRUCTION (EXCEPT FENCES). AFTER COMPLETION OF THE CONSTRUCTION AND BEFORE FINAL ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL ERECT THE MAILBOXES, FENCES, NEWSPAPER BOXES OR STREET SIGNS AND SUPPORTS IN A PERMANENT LOCATION IN ACCORDANCE WITH THE PLANS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. THE WORK SHALL BE INCLUDED IN THE UNIT PRICES BID FOR OTHER ITEMS.

9. PROPERTY PINS AND MONUMENTS ALONG THE ROUTE OF THE IMPROVEMENT, WHICH MAY BE DISTURBED BY THE CONTRACTOR, SHALL BE REFERENCED BY A PROFESSIONAL SURVEYOR, SO THEY CAN BE REPLACED IN THE EVENT THAT THEY ARE DISTURBED DURING CONSTRUCTION. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT ALL PINS, MONUMENTS AND REFERENCES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF LOCATING AND REFERENCING AND REPLACING THE PROPERTY PINS AND MONUMENTS.

10. ALL CONSTRUCTION ACCESS, STORAGE, EQUIPMENT STAGING, SHAFT EXCAVATIONS, LINER ASSEMBLY AREAS, AND RESTORATION ACTIVITIES SHALL BE CONTAINED WITHIN THE LIMITS OF THE EASEMENTS AND PERMITTED PROJECT LIMIT AREAS AS SHOWN IN PLANS.

PROHIBITED CONSTRCUTION ACTIVITIES

1. THE USE OF EXPLOSIVES, UNLESS A PERMIT IS ISSUED BY THE OWNER.

2. PUMPING OF SEDIMENT-LADEN WATER FROM TRENCHES OR OTHER EXCAVATIONS DIRECTLY INTO ANY SURFACE WATERS, STREAM CORRIDORS, OR STORM SEWERS; ALL SUCH WATER WILL BE PROPERLY FILTERED OR SETTLED TO REMOVE SILT PRIOR TO RELEASE.

3. DISCHARGING POLLUTANTS SUCH AS CHEMICALS, FUELS, LUBRICANTS, BITUMINOUS MATERIALS, RAW SEWAGE, OR ANY OTHER HARMFUL WASTE INTO OR ALONGSIDE OF RIVERS, STREAMS, IMPOUNDMENTS OR INTO NATURAL OR MAN-MADE CHANNELS LEADING THERETO.

4. OPEN BURNING OF PROJECT DEBRIS WITHOUT A PERMIT. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AN OEPA OPEN BUILDING AIR PERMIT OR DISPOSING OF THE TREES AND STUMPS

5. STORING CONSTRUCTION EQUIPMENT AND VEHICLES AND/OR STOCKPILING CONSTRUCTION MATERIALS ON PROPERTY, PUBLIC OR PRIVATE, NOT PREVIOUSLY SPECIFIED ON THE PLANS BY THE ENGINEER FOR SUCH PURPOSES.

6. RUNNING WELL POINT OR PUMP DISCHARGE LINES THROUGH PRIVATE OR PUBLIC PROPERTY AND RIGHTS-OF-WAY WITHOUT PERMISSION OF THE PROPERTY OWNER AND THE CONSENT OF THE ENGINEER.

7. OPERATION ENTAILING THE USE OF VIBRATORY HAMMERS OR COMPACTORS OUTSIDE THE HOURS OF 8:00 AM AND 5:00 PM OR OUTSIDE THE HOURS ALLOWED BY LOCAL ORDINANCES OR REGULATIONS.

8. CLOSING OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE OR BOULEVARD WITHOUT THE PRIOR CONSENT OF MUNICIPAL OFFICIALS AND THE ENGINEER AND CLOSING CLEAR ACCESS:
   a. BY FIRE PROTECTION EQUIPMENT AND EMERGENCY VEHICLES;
   b. BY THE PUBLIC TO ANY COMMERCIAL OR PROFESSIONAL PLACE OF BUSINESS, QUASI-PUBLIC OR PUBLIC ESTABLISHMENT, OR PLACE OF RESIDENCE; OR
   c. BY VEHICLES TO DRIVEWAYS WITHOUT THE PROVISION OF ALTERNATIVE MEANS OF BUILDING INGRESS AND EGRESS.

10. DISPOSING OF EXCESS OR UNSUITABLE EXCAVATED MATERIAL IN WETLANDS OR FLOODPLAINS, EVEN WITH THE PERMISSION OF THE PROPERTY OWNER.

11. LOCATING STOCKPILE STORAGE AREAS IN ENVIRONMENTALLY SENSITIVE AREAS.

12. INDISCRIMINATE, ARBITRARY, OR CAPRICIOUS OPERATION OF EQUIPMENT IN AND STREAM CORRIDORS, ANY WETLANDS, ANY SURFACE WATERS, OR OUTSIDE THE EASEMENT LIMITS.

13. PERMANENT OR UNSPECIFIED ALTERATION OF THE FLOW LINE OF ANY STREAM.

14. DAMAGING VEGETATION OUTSIDE OF THE CONSTRUCTION AREA.

15. DISPOSAL OF TREES, BRUSH, AND OTHER DEBRIS IN ANY STREAM CORRIDORS, ANY WETLANDS, ANY SURFACE WATERS, OR AT UNSPECIFIED LOCATIONS.

16. DISCHARGING INJURIOUS SILICA DUST CONCENTRATIONS INTO THE ATMOSPHERE RESULTING FROM BREAKING, CUTTING, CHIPPING, RILLING, BUFFING, GRINDING, POLISHING, SHAPING OR SURFACING CLOSER THAN 200 FEET TO PLACES OF RESIDENCES OR COMMERCIAL, PROFESSIONAL, QUASI-PUBLIC OR PUBLIC PLACES OF HUMAN OCCUPATION.

17. NO USING ANY SUBSTANCE OTHER THAN WATER TO CONTROL DUST.

18. THE CONTRACTOR SHALL SUPPLY ALL LABOR, MATERIAL AND EQUIPMENT NECESSARY, SUCH AS CALCIUM CHLORIDE, WATER OR A MOTORIZED DUST-FREE STREET SWEEPING DEVICE PERFORMED DAILY OR AS DIRECTED BY THE OWNER, TO MAINTAIN ALL PAVED AREAS AFFECTED BY THE CONSTRUCTION.

EXISTING UTILITIES:

1. THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED BY A COMBINATION OF SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE OWNER DOES NOT GUARANTEE THEIR ACCURACY OR COMPLETENESS. THE CONTRACTOR IS RESPONSIBLE TO VERIFY AND IDENTIFY ALL UTILITIES ILLUSTRATED ON THE PLANS OR NOT IDENTIFIED.

2. BEFORE ANY WORK IS STARTED, THE CONTRACTOR SHALL CALL THE "OHIO UTILITIES PROTECTION SERVICE", OUPS, AT 1-800-362-2764, A MINIMUM OF SEVENTY-TWO (72) HOURS IN ADVANCE OF THE WORK. NON-MEMBER UTILITIES MUST BE CONTACTED DIRECTLY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS, AT NO ADDITIONAL EXPENSE TO THE OWNER, TO AVOID DAMAGE TO EXISTING UNDERGROUND AND OVERHEAD UTILITY LINES DURING THE ENTIRE PROJECT. IN THE EVENT OF DAMAGE TO EXISTING PUBLIC AND/OR PRIVATE UTILITIES, THE AGENCY CONCERNED SHALL BE NOTIFIED IMMEDIATELY BY THE CONTRACTOR AND ALL REPAIR WORK SHALL BE EXECUTED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE RESPECTIVE AGENCY AT NO ADDITIONAL EXPENSE TO THE OWNER, INCLUDING ANY INSPECTION FEES OR MAINTENANCE CREWS.

3. DELAYS TO THE CONTRACTOR AS A RESULT OF TIMING OF POLE RELOCATION OR PROTECTION SHALL NOT BE CONSIDERED COMPENSABLE DELAYS, AS IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THEIR WORK IN CONFORMANCE TO THE UTILITY COMPANY'S SCHEDULE.

4. CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL THE EXISTING GAS, WATER, ELECTRIC, CABLE, FIBER, TELEPHONE, SANITARY OR OTHER UNDERGROUND UTILITIES PRIOR TO THE INSTALLATION OF ANY PROPOSED IMPROVEMENT INDICATED ON THE PLANS. SHOULD A CONFLICT EXIST AT A UTILITY CROSSING, THE PROJECT ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION OF THE EXISTING UTILITY OWNERS AND THE UTILITY PROTECTION SERVICE IN THE LIST FEATURED ON THE COVER OF THE PLANS IN ACCORDANCE WITH SECTION 153.64 OF THE OHIO REVISED CODE.

6. IN THE EVENT THAT ANY LEAD SERVICE CONNECTION IS ENCOUNTERED DURING THIS PROJECT BY THE CONTRACTOR, AQUA OHIO SHALL BE IMMEDIATELY NOTIFIED AND WORK AT THAT LOCATION SHALL CEASE UNTIL DIRECTION ON HOW TO PROCEED IS MADE BY LCDU. CONTRACTOR SHALL CONTINUE WITH WORK ONCE LCDU GIVES NOTICE TO PROCEED WITHOUT ADDITIONAL PAYMENT FOR REMOBILIZATION.

TRAFFIC CONTROL

1. MAINTAINING TRAFFIC SHALL BE IN ACCORDANCE WITH ODOT ITEM 614 AND THE MOST RECENT VERSION OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

2. A TRAFFIC CONTROL PLAN IS NOTED ON SHEET 6. ANY MODIFICATION TO THE TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE ENGINEER BY THE CONTRACTOR FOR REVIEW AND ACCEPTANCE BEFORE PROCEEDING.

3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN SAFE LOCAL ACCESS, VEHICULAR AND PEDESTRIAN INCLUDING PERSONS WITH DISABILITIES, TO ALL PROPERTIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR WILL FURNISH, MAINTAIN AND SUBSEQUENTLY REMOVE ALL NECESSARY SAFEGUARDS SUCH AS BARRICADES, BARRIERS, TEMPORARY PAVEMENT, LIGHTING, FLAGGERS, SIGNING, PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROLS TO ENSURE THE SAFETY OF PERSONS AND VEHICLES DURING CONSTRUCTION WITHIN THE PROJECT LIMITS.

4. AT ALL EXCAVATION LOCATIONS THE CONTRACTOR SHALL PROVIDE SUITABLE FLASHERS, BARRICADES, AND TRAFFIC CONTROL DEVICES AS DEEMED NECESSARY BY THE ENGINEER AND IN ACCORDANCE WITH THE OMUTCD FOR SUCH TIME UNTIL THE AREA IS COMPLETELY BACKFILLED.

5. ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH ITEM 614 AND OTHER APPLICABLE PORTIONS OF THE SPECIFICATIONS, AS WELL AS THE OHIO MUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR ITEM 614, MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN OR INCLUDED IN OTHER PAY ITEMS.

6. ACCESS MUST BE MAINTAINED FOR EMERGENCY VEHICLES AT ALL TIMES.

7. NO TRENCH WILL BE LEFT OPEN AT THE END OF A WORK DAY, WHERE PRACTICAL; ANY OPEN TRENCH WILL BE PROPERLY IDENTIFIED AND BARRICADED FOR SAFETY PURPOSES.

8. PRIOR TO CLOSING OFF CLEAR ACCESS TO ANY PUBLIC ALLEY, STREET, ROAD, AVENUE, OR BOULEVARD, THE CONTRACTOR MUST HAVE CONSENT FROM LOCAL OFFICIALS AND THE ENGINEER.

9. PRIOR TO CLOSING OFF ACCESS TO ANY PORTION OF PRIVATE PROPERTY WHERE SEWER WORK MAY BE LOCATED, THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM THE PROPERTY OWNER TO IMPLEMENT PROPOSED TRAFFIC CONTROL DEVICES WHICH SHALL ALSO REQUIRE FINAL APPROVAL BY THE ENGINEER.

TREE/VEGETATION PROTECTION

1. TREE REMOVAL WILL NOT BE PERMITTED UNLESS APPROVED BY THE OWNER AND ENGINEER.

2. TREE REMOVAL WILL BE LIMITED TO THE TIME PERIOD BETWEEN OCTOBER 1 AND MARCH 31.

3. TREE REMOVAL WILL BE LIMITED TO THAT NECESSARY FOR CONSTRUCTION AND WILL BE LIMITED FURTHER TO THE PERMANENT EASEMENT WHEREVER POSSIBLE.

4. NO TREE REMOVAL WILL BE PERMITTED OUTSIDE THE TEMPORARY OR PERMANENT EASEMENT WITHOUT PERMISSION OF THE ENGINEER.

5. TREES WHICH ARE NOT REMOVED WILL BE PROTECTED BY ENSURING THAT TREES TO BE REMOVED ARE FELLED SO AS NOT TO INJURE THE REMAINING TREES.

6. THE PROJECT IS WITHIN THE RANGE OF THE STATE AND FEDERALLY ENDANGERED INDIAN BAT (MYOTIS SODALIS) AND NORTHERN LONG-EARED BAT (MYOTIS SEPTENTRIONALIS), THE STATE ENDANGERED LITTLE BROWN BAT (MYOTIS LUCIFUGUS), AND THE STATE ENDANGERED TRICOLORED BAT (PERIMYOTIS SUBFLAVUS) AND MAY IMPACT SUMMER ROOSTING HABITAT FOR THESE SPECIES. PER U.S. FISH AND WILDLIFE RECOMMENDATIONS, THE REMOVAL OF TREES GREATER THAN OR EQUAL TO 3-INCHES IN DIAMETER SHOULD ONLY OCCUR BETWEEN OCTOBER 1 AND MARCH 31. IF THIS TIME FRAME CANNOT BE FOLLOWED, THE U.S. FISH AND WILDLIFE SERVICE AND OHIO DEPARTMENT OF NATURAL RESOURCES (CONTACT EILEEN WYZA AT EILEEN.WYZA@DNR.OHIO.GOV) MUST BE CONTACTED PRIOR TO CUTTING FOR GUIDANCE ON NECESSARY STEPS TO DOCUMENT THE ABSENCE OR PRESENCE OF THESE SPECIES.

7. PRIOR TO CLEARING, THE CONTRACTOR AND ENGINEER, SHALL WALK THE ACQUIRED EASEMENTS IN AN EFFORT TO DESIGNATE THE TREES THAT ARE TO BE SAVED. TREES TO BE SAVED WILL BE CLEARLY MARKED BY PAINT WITH THE LETTER "S". TREES TO BE PROTECTED BY AN APPROPRIATE BARRIER SHALL BE MARKED WITH AN "S" ENCLOSED IN A CIRCLE. TREES MARKED FOR REMOVAL IN THE PLANS WILL BE INSPECTED BY THE OWNER AND THE ENGINEER BEFORE REMOVAL & WILL BE SAVED WHERE POSSIBLE.

8. SOIL AND OTHER MATERIAL WILL NOT BE STORED NEXT TO OR WITHIN THE DRIP-LINEOF TREES.

9. PRESERVATION OF LANDSCAPING SHOULD TAKE PRECEDENCE OVER REMOVAL. IF REMOVAL OR DAMAGE IS UNAVOIDABLE, EXISTING VEGETATION SHOULD BE REPAIRED OR REPLACED "IN-KIND" UNLESS THE PROPERTY OWNER SPECIFIES OTHERWISE.

10. IF TREES/SHRUBS CANNOT BE REPLACED IN THE SAME LOCATION DUE TO INSTALLATION OF THE SEWER SYSTEM, RELOCATION SHOULD BE CONSIDERED.

ENVIRONMENTAL PROTECTION, MATERIAL DISPOSAL, AND TEMPORARY SURFACES

1. ALL MATERIALS TO BE REMOVED FROM THE PROJECT SITE, INCLUDING SURPLUS EXCAVATED MATERIAL, DEMOLITION DEBRIS, CONSTRUCTION DEBRIS, AND OTHER WASTE MATERIALS, SHALL BE DISPOSED OF OFF-SITE IN AN ENVIRONMENTALLY SOUND MANNER IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS, AT A LOCATION APPROVED BY THE OWNER AND ENGINEER. NO MATERIALS SHALL BE DISPOSED OF IN WETLANDS, FLOODPLAINS, SURFACE WATERS, OR OTHER ENVIRONMENTALLY SENSITIVE AREAS. EROSION CONTROL MEASURES AT THE DISPOSAL SITE SHALL BE INSTALLED, MAINTAINED, AND REMOVED BY THE CONTRACTOR AS NECESSARY, AND ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPROVALS, PERMITS, LICENSES, AGREEMENTS, AND WRITTEN PERMISSIONS REQUIRED FOR DISPOSAL, INCLUDING APPROVAL FROM THE OWNER AND/OR PROPERTY OWNER OF THE DISPOSAL SITE. COPIES OF ALL APPROVALS AND PERMITS SHALL BE PROVIDED TO THE ENGINEER PRIOR TO DISPOSING OF ANY MATERIAL. GIVING AWAY, TRANSFERRING, OR OTHERWISE PROVIDING EXCAVATED SOIL OR MATERIAL TO OTHERS SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PROPER DISPOSAL OR COMPLIANCE WITH THIS NOTE. ANY TEMPORARY CONSTRUCTION SURFACES, ACCESS AREAS, OR STAGING AREAS USED BY THE CONTRACTOR SHALL BE REMOVED UPON COMPLETION OF THE WORK, AND THE AFFECTED AREAS SHALL BE RESTORED AND STABILIZED TO THE SATISFACTION OF THE OWNER AND ENGINEER.

2. TEMPORARY SURFACES WHERE EXCAVATION ARE LOCATED IN STREETS, DRIVES AND PARKING AREAS FURNISHED AND PLACED BY THE CONTRACTOR AND SHALL BE FULLY MAINTAINED TO MINIMIZE INCONVENIENCE TO THE PUBLIC AT NO ADDITIONAL COST TO THE OWNER.

3. THE ABOVE-DESCRIBED WORK SHALL BE CONSIDERED INCIDENTAL TO THE COMPLETION OF ALL WORK INCLUDED IN THE RESPECTIVE PAY ITEMS AND SHALL NOT BE A SEPARATE PAY ITEM.

GRASS RESTORATION

1. GRASS AREAS TO BE RESTORED SHALL BE SEEDED UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS.

2. SEEDING AND/OR SODDING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 329200.19 OF THE DETAILED SPECIFICATIONS.

3. ALL GRASSED AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED BY SEEDING AND MULCHING RATHER THAN SODDING UNLESS OTHERWISE SHOWN ON PLANS, DETAILS, OR SPECIFICATIONS.

4. SEEDING AND MULCHING OF ALL DISTURBED AREAS SHALL IMMEDIATELY FOLLOW EXCAVATION AND SEWER INSTALLATION OPERATIONS.

DEWATERING PROCEDURES

1. ALL DEWATERING FLOWS FROM EXCAVATION AND TRENCHING OPERATIONS SHALL BE SETTLED INTO INSTALLATION BASINS OR DIRECTED THROUGH APPROVED FILTERING DEVICES PRIOR TO BEING DISCHARGED TO STABILIZED SITES, SUCH AS STREAMS OR STORM SEWER; NOT ONTO EXPOSED SOILS, STREAM BANKS, OR ANY EITHER SITE WHERE THE FLOW COULD CAUSE OR INCREASE THE RATE OF EROSION.

2. SILT FROM CONSTRUCTION OPERATIONS SHALL NOT BE PERMITTED TO ENTER INTO THE STORM SEWER SYSTEM. FOR THE ENTIRE COURSE OF CONSTRUCTION, EROSION CONTROL (FILTERS OR OTHER APPROVED BMPS) MEASURES SHALL BE IMPLEMENTED AT ALL NEARBY INLETS TO PREVENT SILT FROM ENTERING INTO THE SYSTEM. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THESE DEVICES FOR THE ENTIRE DURATION OF CONSTRUCTION AND SHALL ONLY REMOVED BY ORDER OF THE ENGINEER.

3. CONVEY WATER FROM THE CONSTRUCTION SITE IN A CLOSED CONDUIT. TRENCH EXCAVATIONS SHALL NOT BE PERMITTED AS TEMPORARY DRAINAGE DITCHES.

EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY SOIL EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH ODOT ITEM 207 AND AS REQUIRED BY THE LAKE COUNTY SOIL AND WATER CONSERVATION DISTRICT.

2. SITE CLEARING AND GRUBBING SHALL NOT COMMENCE UNTIL SUCH TIME THAT THE CONTRACTOR IS PREPARED TO START CONSTRUCTION. REMOVE ONLY THOSE TREES, SHRUBS, AND GRASSES THAT MUST BE REMOVED FOR CONSTRUCTION OF ACTUAL FACILITIES; PROTECT THE REST TO PRESERVE THEIR AESTHETIC, HABITAT, AND EROSION CONTROL VALUES.

3. IMMEDIATELY FOLLOWING SITE AND ACCESS CLEARING, TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED. THEY WILL BE MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION UNTIL FINAL SEEDING AND SITE RESTORATION OCCURS.

4. IF WORK IS SUSPENDED FOR ANY REASON, THE CONTRACTOR SHALL MAINTAIN THE SOIL EROSION AND SEDIMENTATION CONTROLS IN GOOD OPERATING CONDITION DURING THE SUSPENSION OF THE WORK. ALSO, WHEN SEASONAL CONDITIONS PERMIT AND THE SUSPENSION OF WORK IS EXPECTED TO EXCEED A PERIOD OF ONE MONTH, THE CONTRACTOR SHALL SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS LEFT EXPOSED WHEN THE WORK IS STOPPED.

SEWER REHABILITATION NOTES

1. ALL SECTIONS OF SEWER SHALL BE CLEANED AND TELEVISED PRIOR TO THE COMMENCEMENT OF ANY REHABILITATION WORK AS REQUIRED BY NASSCO GUIDELINES AND PARTS OF SPECIFICATION DIVISION 33.

2. ALL REHAB SYSTEMS SHALL BE PREPPED, STORED, AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND GUIDELINES.

3. SEWER FLOWS SHALL BE MAINTAINED IN ACCORDANCE WITH SPECIFICATION SECTION 330130.03. ANY AND ALL FLOW MANAGEMENT SYSTEMS REQUIRED TO INSTALL THE REHABILITATION PRESCRIPTIONS SHALL BE INCLUDED IN THE REHABILITATION PAY ITEMS **"84 INCH SLIP LINING, AS PER PLAN"** AND **"120 INCH SPRAY-IN-PLACE PIPE LINING, AS PER PLAN"**, RESPECTIVELY. ALL FLOW MUST BYPASS METHODS AND SETUPS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

4. ALL ACTIVE CONNECTIONS SHALL BE REINSTATED.

STORM SEWER SYSTEM NOTES:

1. ALL STORM SEWER MATERIALS, METHODS AND PROCEDURES FOR INSTALLATION, BEDDING/BACKFILL/HAUNCHING REQUIREMENTS, AND ALL OTHER WORK DIRECTLY ASSOCIATED WITH STORM SEWER SHALL BE IN ACCORDANCE DIVISION 31 AND 33 SPECIFICATION SECTIONS OR AS OTHERWISE SPECIFIED WITHIN THE PLANS AND DETAILS. PROPOSED WORK SHALL FOLLOW ALL ASSOCIATED ASTM STANDARDS.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE PIPE SIZES IN THE AREAS TO RECEIVE REHABILITATION. DIAMETERS ARE BASED ON AVAILABLE SURVEY, BUT SIZES WILL VARY DUE TO DEFLECTION IN THE PIPES. THERE SHALL BE NO ADDITIONAL PAYMENT FOR VARIATION IN PIPE SIZES. OVALITY CALCULATIONS HAVE BEEN ATTACHED IN THE BID DOCUMENTS FOR REFERENCE.

3. ALL MATERIAL SHALL BE INSPECTED, STORED, AND INSTALLED PER THE MANUFACTURES SPECIFICATIONS.

4. CONTRACTOR SHALL RE-CONNECT ALL ENCOUNTERED DOWN SPOUT DRAINS AND OTHER STORM SEWER DRAIN LINES UNLESS DIRECTED OTHERWISE WITHIN.

5. BEFORE FINAL ACCEPTANCE FOR THE WORK, THE CONTRACTOR SHALL CLEAR THE SEWERS OF ANY MORTAR, DIRT OR OTHER REFUSE THAT MAY HAVE BEEN LEFT OR ACCUMULATED IN THE SEWERS. ALL MANHOLES AND OTHER STRUCTURES SHALL BE CLEARED OF ALL FORMS, SCAFFOLDING, BULKHEADS, CENTERING, SURPLUS MORTAR, RUBBISH OR DIRT AND LEFT IN A CLEAN AND PROPER CONDITION.

STATE OF OHIO
TIMOTHY MCLAUGHLIN
E-83985
REGISTERED
PROFESSIONAL ENGINEER

verdantas

NO	REVISION	DATE
1	REVISIONS PER ADDENDUM 1	10/29/26

SCALE: AS NOTED
DATE: 10/09/2026
DESIGNED BY: MMG & JPB
DRAWN BY: JPB
CHECKED BY: TJM

CITY OF WILLOWICK, OHIO
LARIMAR CULVERT IMPROVEMENTS
LAKE COUNTY OHIO

GENERAL - 00 SERIES
GENERAL NOTES

PROJECT NO: 43427
DRAWING NAME: 00G-03
SHEET: 3 OF: 15

EXISTING PLAN LINE SYMBOLOGY:

- SAN — SANITARY SEWER
- STM — STORM SEWER
- WAT — WATER LINE
- PROPERTY LINE
- MAINTENANCE EASEMENT
- ROADWAY AND SIDEWALK
- FENCE
- SANITARY MANHOLE
- STORM MANHOLE
- CATCH BASIN

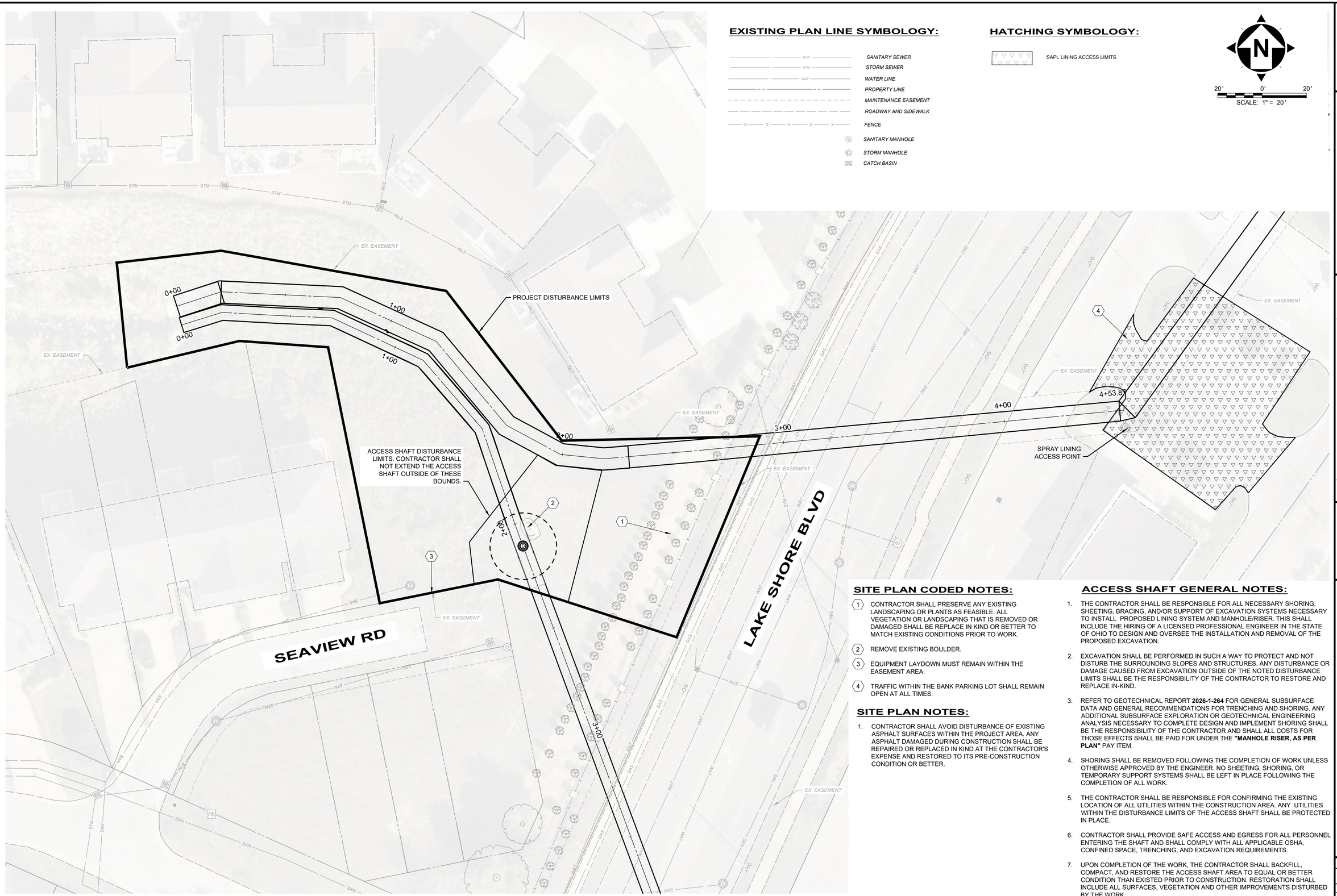
HATCHING SYMBOLOGY:

- SAPL LINING ACCESS LIMITS

N

20' 0' 20'

SCALE: 1" = 20'



SITE PLAN CODED NOTES:

1. CONTRACTOR SHALL PRESERVE ANY EXISTING LANDSCAPING OR PLANTS AS FEASIBLE. ALL VEGETATION OR LANDSCAPING THAT IS REMOVED OR DAMAGED SHALL BE REPLACE IN KIND OR BETTER TO MATCH EXISTING CONDITIONS PRIOR TO WORK.
2. REMOVE EXISTING BOULDER.
3. EQUIPMENT LAYDOWN MUST REMAIN WITHIN THE EASEMENT AREA.
4. TRAFFIC WITHIN THE BANK PARKING LOT SHALL REMAIN OPEN AT ALL TIMES.

SITE PLAN NOTES:

1. CONTRACTOR SHALL AVOID DISTURBANCE OF EXISTING ASPHALT SURFACES WITHIN THE PROJECT AREA. ANY ASPHALT DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE AND RESTORED TO ITS PRE-CONSTRUCTION CONDITION OR BETTER.

ACCESS SHAFT GENERAL NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY SHORING, SHEETING, BRACING, AND/OR SUPPORT OF EXCAVATION SYSTEMS NECESSARY TO INSTALL PROPOSED LINING SYSTEM AND MANHOLE/RISER. THIS SHALL INCLUDE THE HIRING OF A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF OHIO TO DESIGN AND OVERSEE THE INSTALLATION AND REMOVAL OF THE PROPOSED EXCAVATION.
2. EXCAVATION SHALL BE PERFORMED IN SUCH A WAY TO PROTECT AND NOT DISTURB THE SURROUNDING SLOPES AND STRUCTURES. ANY DISTURBANCE OR DAMAGE CAUSED FROM EXCAVATION OUTSIDE OF THE NOTED DISTURBANCE LIMITS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RESTORE AND REPLACE IN-KIND.
3. REFER TO GEOTECHNICAL REPORT **2026-1-264** FOR GENERAL SUBSURFACE DATA AND GENERAL RECOMMENDATIONS FOR TRENCHING AND SHORING. ANY ADDITIONAL SUBSURFACE EXPLORATION OR GEOTECHNICAL ENGINEERING ANALYSIS NECESSARY TO COMPLETE DESIGN AND IMPLEMENT SHORING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL ALL COSTS FOR THOSE EFFECTS SHALL BE PAID FOR UNDER THE **"MANHOLE RISER, AS PER PLAN"** PAY ITEM.
4. SHORING SHALL BE REMOVED FOLLOWING THE COMPLETION OF WORK UNLESS OTHERWISE APPROVED BY THE ENGINEER. NO SHEETING, SHORING, OR TEMPORARY SUPPORT SYSTEMS SHALL BE LEFT IN PLACE FOLLOWING THE COMPLETION OF ALL WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE EXISTING LOCATION OF ALL UTILITIES WITHIN THE CONSTRUCTION AREA. ANY UTILITIES WITHIN THE DISTURBANCE LIMITS OF THE ACCESS SHAFT SHALL BE PROTECTED IN PLACE.
6. CONTRACTOR SHALL PROVIDE SAFE ACCESS AND EGRESS FOR ALL PERSONNEL ENTERING THE SHAFT AND SHALL COMPLY WITH ALL APPLICABLE OSHA, CONFINED SPACE, TRENCHING, AND EXCAVATION REQUIREMENTS.
7. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL BACKFILL, COMPACT, AND RESTORE THE ACCESS SHAFT AREA TO EQUAL OR BETTER CONDITION THAN EXISTED PRIOR TO CONSTRUCTION. RESTORATION SHALL INCLUDE ALL SURFACES, VEGETATION AND OTHER IMPROVEMENTS DISTURBED BY THE WORK.
8. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR THE DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, SAFETY, AND PERFORMANCE OF THE ACCESS SHAFT AND ALL ASSOCIATED TEMPORARY WORKS

SITE ACCESS PLAN

STATE OF OHIO
TIMOTHY MCLAUGHLIN E-83985
REGISTERED PROFESSIONAL ENGINEER

verdantas

NO	REVISION	DATE
1	REVISIONS PER ADDENDUM 1	10/29/26

SCALE:	AS NOTED
DATE:	10/08/2026
DESIGNED BY:	MMG & JPB
DRAWN BY:	JPB
CHECKED BY:	TJM

CITY OF WILLOWICK, OHIO
LARIMAR CULVERT IMPROVEMENTS
LAKE COUNTY OHIO

CIVIL - 10 SERIES

SITE ACCESS PLAN

PROJECT NO:	
43427	
DRAWING NAME	
10C-05	
SHEET	OF
8	15