85 WEST HIGHWAY M-115
BOON, MICHIGAN 49618
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WEXFORD COUNTY ROAD COMMISSION

OUR MISSION IS TO IMPROVE AND MAINTAIN A SAFE AND EFFICIENT ROAD SYSTEM

August 11, 2025

NOTICE TO CONTRACTORS AND MATERIAL SUPPLIERS

Sealed bids will be received at the office of the Wexford County Road Commission, 85 West Highway M-115, Boon, Michigan 49618 until 2:00 p.m. Monday, August 25, 2025, at which time and place the bids will be opened and read by the Wexford County Road Commission for culvert relining/repair.

CIPP Culvert Liner and Pressure Grout Package

70’ of 18” Dia Concrete Pipe - Culvert on M-55, Wexford County
82’ of 36” Dia Concrete Pipe - Culvert on US-131, Kalkaska County
80’ of 48”x42” Concrete Cast in Place Box - Culvert on M-37, Wexford County

Specifications are available at the Road Commission office in Boon, Michigan. Telephone or faxed bids will not be accepted.

All materials and all work will be in accordance with the 2020 MDOT Standard Specifications for Construction and the attached special provisions.
Insurance requirements shall be in accordance with the 2020 MDOT Standard Specifications for Construction. Award is contingent upon Board approval.

The Wexford County Road Commission, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Sub-Title A, Office the Secretary, Part 21, Nondiscrimination in Federally assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

The Board reserves the right to reject any or all bids or any part of the same, to waive irregularities and/or informalities and to make the award in part or entirety in any manner deemed to be in the best interest of the Wexford County Road Commission.

Wexford County Road Commission

Harry Hagstrom, Chairman
Harold Falan, Vice-Chairman
Dean Jurik, Member
Jim Leggett, Member
Robert Hilty, Member

WEXFORD COUNTY ROAD COMMISSION / MDOT TWA
CIPP Culvert Liner and Pressure Grout Package
Multiple Locations Bid Proposal

Project 1 Location:
M-55
Cherry Grove Township, Section 15, Wexford County, Michigan
This crossing is located approximately 1000' east of the intersection of M-55 and S 31 Rd.
The culvert is non-reinforced concrete pipe, 18" diameter x 70' long.

Project 1 Description of Work:
The existing concrete culvert has many joints that are separating along with one section of the pipe has split lengthwise and is starting to sag, causing a dip in the shoulder of the road.

The work for this project will consist of the construction of a temporary coffer dam. There is a small amount of ditch water that flows into this area. Bypass pumping may be required. The cost for bypass pumping, if required, will be included in the cost of the pipe repair. The contractor is responsible for cleaning out all debris and televising the pipe to locate and record the failed joints and section. After completion of the cleaning and televising, the Contractor shall perform grouting of the interior of the culvert to smooth the damaged, irregular barrel of the pipe. The final phase of this repair is to place an Ultra-violet light cured-in-place fiberglass liner per the attached special provisions.
Upon completion of the liner placement, the Contractor shall complete any required restoration of the front slope, ditch, or road shoulder, and repair any damage occurred during the relining process.

Maintaining Traffic:
The completed work for Traffic Control, including all labor, materials, and equipment as required, shall include, but not be limited to, the following items described in the 2020 MDOT Standard Specifications for Construction.

Lighted Arrow, Type C
Channelizing Device. 42 inch
Flag Control and signage per MMUTCD
Sign, Type B, Temporary
Minor Traffic Devices
Sign Covers

These items will not be paid for separately but will be included in and paid for in the Lump Sum unit price for the installation of **18" – CIPP Installation, Lump Sum.**

Project Schedule:
Project to be completed prior to December 5, 2025. No work on Saturdays, Sundays, or holidays. Once the contractor has started work at any culvert location, it must be completed within 5 working days.

Measurement and Payment:
Project will be paid for based as a lump sum payment for all labor, equipment, and materials to complete the installation per the attached special provisions at each location.

Insurance Requirements:
Insurance: Requirements as per MDOT 2020 Standard Specifications for Construction.

Bid Bond Requirements:
Bid bond is not required on this project.

Project 2 Location:
US 131
Boardman Township, Section 15, Kalkaska County, Michigan
This crossing is located approximately 5900' northeast of the intersection of US 131 and Church St. on Taylor Creek.
The culvert is reinforced concrete pipe, 36" diameter x 82' long.

Project 2 Description of Work:
The existing concrete culvert has joints that are separating along with some joints that have dropped and misaligned, causing sags within the pipe. The sags are causing erosion in both shoulders of the road. This structure is located in Taylor Creek. There may be some specific EGLE guidelines to follow.
The work for this project will consist of the construction of a temporary coffer dam. There is a constant flow of water. Bypass pumping will be required. The cost for bypass pumping will be included in the cost of the pipe repair. The contractor is responsible for cleaning out all debris and televising the pipe to locate and record the failed joints and section. After completion of the cleaning and televising, the Contractor shall install an Ultra-violet light cured-in-place fiberglass liner per the attached special provisions.
Upon completion of the liner placement, the Contractor shall complete any required restoration of the front slope, ditch, or road shoulder, and repair any damage occurred during the relining process.

Maintaining Traffic:
The completed work for Traffic Control, including all labor, materials, and equipment as required, shall include, but not be limited to, the following items described in the 2020 MDOT Standard Specifications for Construction:

Temporary Rumble Strips for Flag Control
Lighted Arrow, Type C
Channelizing Device. 42 inch
Flag Control and signage per MMUTCD
Sign, Type B, Temporary
Minor Traffic Devices
Sign Covers

These items will not be paid for separately but will be included in and paid for in the Lump Sum unit price for the installation of **36" – CIPP Installation, Lump Sum.**

Project Schedule:
Project to be completed prior to December 5, 2025. No work on Saturdays, Sundays, or holidays. Once the contractor has started work at any culvert location, it must be completed within 5 working days.

Measurement and Payment:
Project will be paid for based as a lump sum payment for all labor, equipment, and materials to complete the installation per the attached special provisions at each location.

Insurance Requirements:
Insurance: Requirements as per MDOT 2020 Standard Specifications for Construction.

Bid Bond Requirements:
Bid bond is not required on this project.

Project 3 Location:
M-37
Hanover Township, Section 31, Wexford County, Michigan
This crossing is located approximately 1575' north of the intersection of M-37 and S 14 Rd. on and un-named creek.
The culvert is a 48" x 42" cast-in-place concrete box culvert, approximately 80' long.

Project 3 Description of Work:
The existing concrete box culvert has cracking along the inside. There are 5 transverse cracks inside the structure along with cracking on the outlet wing walls. Boths the sides and the top of the structure are cracked. Some of the cracking has shifted causing gaps where sediment is now entering the structure. The gaps vary in width from ¼" to nearly 1" in width. Some of the cracks have spalling and pieces missing. There is also spalling creating a void at the bottom of the wall where it meets the floor of the structure.
This structure location has difficult access. The location is behind existing guardrail and down a very steep (1 on 1), vegetated slope, approximately 20' below the roadway. There is approximately 2" of water flowing through the structure.

The work for this project will consist of drilling holes and placing grout ports (typically 4 ports per crack on each surface) along the cracks within the structure, pressure grouting the void behind the wall of the structure with chemical grout, removing the grout ports, and sealing the cracks with hydraulic cement material.

Upon completion of the grouting and sealing, the Contractor shall complete any required restoration of the front slope, ditch, or road shoulder, and repair any damage occurred during the grouting process.

Maintaining Traffic:
This location has an 8' paved shoulder with guardrail. There is not enough room to safely complete this work under a shoulder closure. A lane closure will be required if materials and equipment cannot be contained behind the edge line on the shoulder.
The completed work for Traffic Control, including all labor, materials, and equipment as required, shall include, but not be limited to, the following items described in the 2020 MDOT Standard Specifications for Construction:

Temporary Rumble Strips for Flag Control
Lighted Arrow, Type C
Channelizing Device. 42 inch
Flag Control and signage per MMUTCD
Sign, Type B, Temporary
Minor Traffic Devices
Sign Covers

These items will not be paid for separately but will be included in and paid for in the Lump Sum unit price for the installation of **Chemical Grouting Setup 48" x 42" Box Culvert, Lump Sum.**

Project Schedule:
Project to be completed prior to December 5, 2025. No work on Saturdays, Sundays, or holidays. Once the contractor has started work at any culvert, it must be completed within 5 working days.

Measurement and Payment:
Project will be paid for based as a lump sum payment for all labor, equipment, and materials to complete the installation per the attached special provisions at each location.

Insurance Requirements:
Insurance: Requirements as per MDOT 2020 Standard Specifications for Construction.

Bid Bond Requirements:
Bid bond is not required on this project.

WEXFORD COUNTY ROAD COMMISSION / MDOT TWA
CIPP Culvert Liner and Pressure Grout Package
Multiple Locations
Bid Tab

Wexford County, Michigan.

All of the work herein specified will be paid for and included in the following pay items:

Items of Work	Lump Sum Price
Project 1 – Culvert on M-55, Wexford County **18" Grout and CIPP Culvert Relining** 18' x 70' Non-Reinforced Concrete Pipe	_____
Project 2 – Culvert on US-131, Kalkaska County **36" CIPP Culvert Relining** 36" x 82' Reinforced Concrete Pipe	_____
Project 3 – Culvert on M-37, Wexford County **Chemical Grouting Setup 48" x 42" Box Culvert** 48" x 42" x 80' Concrete Box Culvert	_____

Project 3 – Optional Pay Items:	Unit	Unit Price
Additional Grout Ports	Ea	_____
Additional Chemical Grout	Gal.	_____

Company Name_____

Address_____

Email_____

By (Name and Title) _____

Authorized Signature_____

Date_____

WEXFORD COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR

Pressurized Injection Grouting,
Cracks (48” x 42” Cast in Place Concrete Box Culvert)

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to grout pipeline cracks using the port injection method.
   1. The work included consists of mixing a chemical acrylamide grout and injecting it through grout ports drilled through the walls and top of structure to stabilize the soils around the structure and fill voids created by erosion through the cracks. The cracks will then be sealed inside the structure.
   2. Equipment and materials to access the chemical grouting locations and to perform the grouting operations as described in the following specifications, or as directed by the Engineer.

1.2 MEASUREMENT AND PAYMENT

A. **Chemical Grouting Setup 48” x 42” Box Culvert, Lump Sum**
The Owner shall pay for the mobilization of equipment necessary to prepare for grouting all crack locations, assembly and testing/verification of the grout delivery system to the crack, drilling of up to four (4) grout ports along each crack and monitoring the in-situ pressure on the exterior of the structure, along with removal, plugging and sealing of the grout ports upon completion of the grouting.

B. **Grout ports** will be included in the Lump Sum pay item and will not be paid for separately. Pump tests and grout gel tests will not be paid for separately but shall be included in the unit price bid for **Chemical Grouting Setup 48” x 42” Box Culvert, Lump Sum**
Additional grout ports (only when approved by Engineer) and excessive grout pumped into the joint, will be paid for separately.

C. **Additional Grout Ports, Each**
The WCRC shall pay for the drilling of grout ports in excess of the number of grout ports included in **Grouting System Setup, 48” x 42” Box Culvert**, **Lump Sum** pay item or

for the as-directed drilling of a grout port while mobilized for grout port drilling at adjacent joints. Additional Grout Ports will be paid for at the Contract unit price per each additional grout port drilled to the specified depth. Additional grout ports will only be accepted and paid for if authorized by WCRC after review of the structure condition or grout takes from previous grouting work on the project. Removal and plugging of the grout ports upon completion of the grouting will not be paid for separately but shall be included in the unit price for **Additional Grout Ports, Each.**

D. **Chemical Grout, Gallon**

The WCRC will not pay separately for the pumping of grout into the approved grout ports in accordance with the specified grouting program as outlined herein. Grout volume up to 8 gallons per crack, per surface, will be included in the pay item, **Grouting System Setup, 42" x 48" Box Culvert**, **Lump Sum.**

Chemical Grout, Additional, Gallon will be paid for at the Contract unit price per gallon of grout pumped into an approved grout port exceeding 8 gallons per crack. Additional grout will only be paid for if authorized by WCRC after review of the grout volume measured by a flow meter and recorded by a data logger. Changes to the grout mix design will not be paid for separately but shall be included in the unit price for **Chemical Grouting Setup 42" x 48" Box Culvert, Lump Sum.**

E. Coordination of work to make changes to the grouting program based on the incremental results of the real-time data logger is included in the overall grouting operation and shall be accommodated by the Contractor at no additional cost to WCRC.

F. The WCRC reserves and shall have the right under the contract to make such changes, from time to time, in the plans and in the quantities of the work, as may be necessary or desirable to insure the completion of the work in the most satisfactory manner.

G. Whenever the quantity of any item of work as given in the proposal shall be increased or decreased, payment for such item of work shall be at the contract price for the actual quantities of work completed.

1.3 GROUTING PROGRAM (PROJECT WORK PLAN)

A. Prepare a Grouting Program in advance of the pre-construction meeting which clearly defines the grouting program in conformance with the requirements of the Contract Documents. The Grouting Program shall at minimum contain:

1. Access plan
2. Work methods and sequence,
3. In-situ pressure testing methods

4. Proposed drilling methods,
5. Port installation,
6. Grout pumping,
7. Grout injection sequence
8. Determination of refusal
9. Grout port sealing methods.

B. Compensation for all work required for the preparation of the Grouting Program shall be included in the cost of the project.

1.4 SUBMITTALS

A. Submit evidence of grouting contractor's experience and qualifications.

1. Provide resumes for the Project Supervisor and Crew Chief/Foreman showing a minimum of three years of sewer grouting experience and projects completed.
2. Provide three (3) projects of similar scope, size and depth that the grouting contractor has successfully performed in the last five (5) years.
3. Modifications to the Project Supervisor and Crew Chief/Foreman may only be made with WCRC approval.

B. Submit proposed mixing equipment, grout ports, pressure/monitoring gauges, flowmeters, data loggers, and other proposed equipment.

C. Submit proposed mix design and material delivery tickets:
1. Description of chemical grout materials to be used.
2. Description of proposed additives to be used.
3. Manufacturer's recommended procedures for storing, mixing, testing, and handling of the chemical grouts.
4. MSDS sheets for all materials to be used.

D. Submit proposed safety plan, including at minimum;
1. Sewer access,
2. Confined space entry,
3. Emergency coordination,
4. Platform design
5. Grout hose washout plan

1.5 QUALITY ASSURANCE

A. Provide grout takes per port. Grout takes to be agreed upon with the Engineer on a daily basis. Provide a calibrated flowmeter to monitor the volume of the grout takes. Report excessive grout takes (over *1 1/2* gallon per inch diameter of sewer) to the Engineer when observed.

B. Adjust the grouting program as necessary based on the incremental results of the real-time data logger, including but not limited to;
I. Grouting mix design

2. Location of grout holes
3. Starting and stopping pressures at particular grout holes
4. Number of grout holes at each crack
5. Grouting volumes
6. Pumping Pressure

C. Observe the Box Culvert for signs of stress during grouting such as noises or cracking. If observed, cease grouting and immediately notify the Engineer.

PART 2 - MATERIALS

2.1 GROUTS - GENERAL

A. All grout materials must have the following characteristics:
1. While being injected, the grout must be able to react /perform in the presence of water (groundwater).
2. The ability to increase grout mix viscosity, density and gel strength by increased concentration of constituents or the use of approved additives.
3. The cured grout must withstand submergence in water without degradation.
4. The resultant grout formation must be homogeneous and prevent the passage of water (infiltration) through the pipe joint.
5. The grout must not be biodegradable.
6. The cured grout should be chemically stable and resistant to organics found in ground water.
7. Residual grout shall be easily removable from the structure to prevent blockage of the drainage flow.

B. Handle, mix, and store grout in accordance with the manufacturer's recommendations. The materials shall be delivered to the site in unopened original manufacturer's containers.

2.2 CHEMICAL GROUTS

A. Water based chemical grouts shall have the following characteristics:
1. A minimum of 10% acrylamide base material by weight in the total grout mix. A higher concentration of acrylamide base material is recommended to increase strength or offset dilution during injection.
2. The ability to tolerate some dilution and react in moving water during injection.
3. A viscosity of approximately 2 centipoises, which can be increased with approved additives.
4. A controllable reaction time from 10 seconds to 1 hour.
5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
6. The ability to increase mix viscosity, density, and gel strength by increased concentrations of the mix constituents or by the use of approved additives.

7. Product Manufacturer:
    a. Avanti AV-100, Avanti AV-118; or equal.

B. Acrylate base grout shall have the following characteristics:
1. A minimum of 10% acrylate base material by weight in the total grout mix.
2. The ability to tolerate some dilution and react in moving water during injection.
3. A viscosity of approximately 1-3 centipoise, which can be increased with approved additives.
4. A controllable reaction time from 10 seconds to 1 hour.
5. A reaction (curing) that produces a homogenous, chemically stable, non-biodegradable, firm, flexible gel.
6. The ability to increase mix viscosity, density and gel strength by the use of approved additives.
7. Product Manufacturer:
    a. DeNeef AC-400, DeNeef Gelacryl SR, Avanti AV-160; or equal.

2.3 ADDITIVES

A. At the CONTRACTOR'S discretion and according to field conditions, additives may be selected and used within the manufacturers recommended quantities.

B. Strengthening Agents
1. For joint grouting, a latex or “diatomaceous earth” additive may be added to increase compressive and tensile strength. The quantity of strengthening agent additive shall be as recommended by the manufacturer and approved by ENGINEER. Product Manufacturer:
    a. Avanti AV-257 Icoset, DeNeef Reinforcing Agent; or equal.
    b. Dye - A manufacturer approved water soluble dye without trace metals may be added to the grout tank(s) for visual confirmation.

2.4 FINISHING GROUT

A. Compressive strength test results (ASTM C-I09) within the following parameters:
1. I hour - 1,500 psi
2. 24 hour - 3,500 psi
3. 28 day - 5,500 psi
4. Initial setting time within 15 min
5. Chemically resistant to withstand internal exposure to domestic sewage when cured.

B. Manufacturers
1. CEMTEC; Hydraulic Cement
2. PermaCast; Patch 20
3. Approved Equal

PART 3 - EXECUTION

3.1 DEWATERING

A. If the CONTRACTOR or ENGINEER deems necessary to completely stop the flow of ground water through the pipe to properly complete the joint grouting, dewatering will be performed at no cost to the Road Commission. Dewatering plan shall be submitted to the Road Commission for approval prior to starting any work.

3.2 PIPE PREPARATION

A. Prior to the application of the chemical grouting materials, the CONTRACTOR shall thoroughly clean the structure designated to receive the chemical grouting. Cleaning shall constitute removal of all loose debris & solids which inhibit proper grouting and finishing.

3.3 GROUT PREPARATION

A. Follow the manufacturer's recommendations for the mixing and safety procedures.
B. Adjust gel time as necessary to compensate for changes in temperature in grout component tanks or hoses. The addition of dilution water to extend gel times is not acceptable unless resulting base grout tank only material exceeds 20% by weight for solution grouts.
C. During the grouting process, the Grouting Technician shall monitor the grout component tanks to ensure that proper ratios are being pumped.

3.4 GROUTING – GENERAL

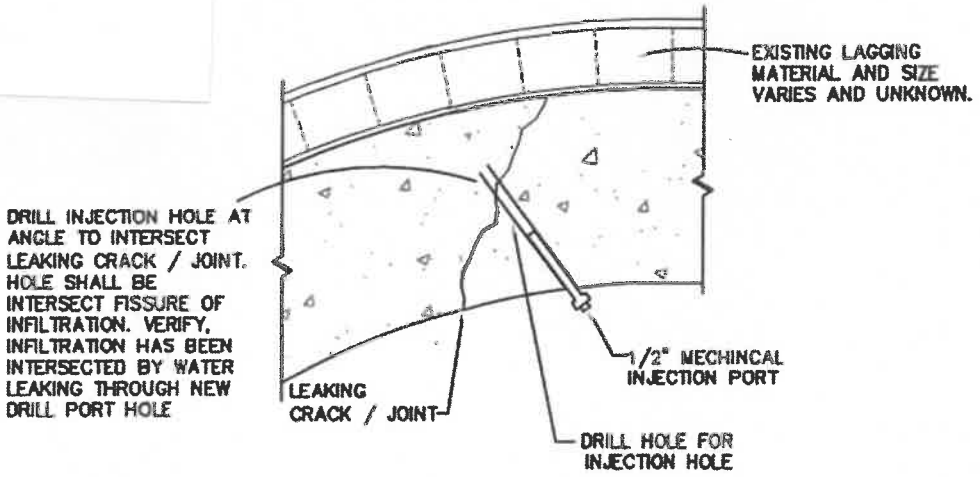
A. Grout all cracks as directed by the ENGINEER. This shall be accomplished by forcing grout through a system of pumps and hoses into and through the grout ports into the area behind the structure.
B. Drill or core through the walls and top of the structure and install grout ports with cement mortar.
    1. Steel reinforcement may be encountered during grout port installation. If encountered, drill a new grout port at no additional cost.
    2. Install grout ports immediately upon completion of drilling
C. Commence grouting in sequence according to the approved Grouting Program. Pump grouting materials through the hose system at a controlled pressure.
D. Provide grouting pressures greater than the hydrostatic pressure and sufficient enough to pump grout through grout ports and into the leaking feature in the pipe.
E. Monitor and record the grout flow and pumping pressure during grout installation.
F. Cease grouting operations once the refusal pressure of the grout port is reached. Record grout takes at each grout port.
G. If excessive grout take (over 8 gallon per crack) is pumped into a single grout location, the grout will be paid for at the bid price of **Grout, Per Gallon.**
H. Remove excess grout from structure. Excess grout shall be defined as a thickness of grout that given its location, size and geometry, could cause blockage. Flush or push forward to the end of the structure, remove from the pipe, and properly dispose of excess grout.
I. Collect and properly dispose of cleaning materials used in the cleaning of the grouting equipment.
J. After grouting is complete, all pipe sections shall be final inspected by means

of a color CCTV system. The inspection shall be conducted as per the NASSCO Pipeline Assessment and Certification Program.

K. Sealing Grout Ports and Cracks.
   1. Seal grout Ports immediately after removal.
   2. Install finishing grout in accordance with manufacturer's recommendations
   3. Utilize two (2) crew members minimum to install the finishing grout. One for mixing grout, and one for placing and finishing grout.
   4. Mix small batches of Finishing Grout at a time.
   5. Force the mixed finishing grout into the port hole and hold with pressure until all water seepage stops and the hydration heat is felt.
   6. Plug long openings and cracks with successive small rolls of finishing grout.
   7. Shave or trowel the surface flush with a sharp finishing tool.

3.5 CLEAN-UP

A. After grouting is complete and all grouting equipment is removed from the pipe, the CONTRACTOR shall clean up all excess material, packaging, waste and debris. The CONTRACTOR shall also perform restoration or repair on any damaged shoulder, either paved, gravel or grass, due to parking equipment along the roadway. This includes raking, seeding and mulching as required. Paved shoulder damage will include sawcutting and HMA patching.



CHEMICAL GROUT CRACK/ FISSURE DETAIL

N.T.S.

CHEMICAL GROUT CRACK/FISSURE SETUP:

1. IDENTIFY CRACKS OR LEAKS TO BE INJECTED IN CONJUNCTION WITH OWNER AND OR ENGINEER.
2. LOCATE REINFORCING STEEL IF WITHIN 6 FEET OF MANHOLE STRUCTURE
3. LOCATE HOLE POSITION AND WORK WITH CARE TO AVOID DAMAGE TO EXISTING REINFORCING STEEL. DRILL PORT HOLES SIZED AS RECOMMENDED BY THE INJECTION MATERIAL MANUFACTURER, AT A 45° ANGLE TO THE SURFACE, AND BEGINNING 6" AWAY FROM THE CRACK SO THAT THE DRILLED HOLE INTERCEPTS THE CRACK.
   - 3A. TYPICALLY IF THEIR IS INFILTRATION AT THE CRACK, THE NEWLY DRILLED HOLE SHOULD HAVE WATER LEAKING FROM IT, SIGNIFYING THE FISSURE HAS BEEN INTERSECTED PROPERLY.
   - 3B. IF THE INFILTRATION IS NOT ACTIVE AT THE TIME OF DRILLING, INSERT NOZZLE INTO DRILLED PORT HOLE AND FLUSH CHLORINATED WATER THROUGH, VERIFY WATER EMERGES FROM FISSURE.
   - 3C. IF WATER DOES NOT FLUSH THROUGH FISSURE, REPEAT PROCESS UNTIL INFILTRATION VERIFICATION IS ACHIEVED.
4. DRILL OR CORE GROUT HOLES ON EITHER SIDE OF THE JOINT ON AN ANGLE TO INTERCEPT SEPARATION AS SHOWN IN CHEMICAL GROUT/FISSURE DETAIL.
5. DETERMINE AND RECORD IN-SITU PRESSURE AT EACH GROUT PORT PRIOR TO INSTALLATION OF CHEMICAL GROUT.
6. PAYMENT FOR CRACK/FISSURE REPAIRS WILL BE PAID FOR WITH THE AS-NEEDED BID ITEM FOR "ADDITIONAL GROUT PORT-EA", AND WILL BE ACCOMPANIED WITH ONE OR MORE OF THE FOLLOWING BID ITEMS: "CHEMICAL GROUT-GAL", "CONCRETE PREP AND REPAIR" (IF NEEDED) AND "FRACTURE REPAIR-LFT" (IF NEEDED).
7. "ADDITIONAL GROUT PORT" INCLUDES ALL COSTS NECESSARY FOR IDENTIFICATION OF THE CRACK/FISSURE, OWNER/ENGINEER COORDINATION, SETUP AND CORING HOLE(S) AND INSTALLATION OF GROUT PORT PER DETAIL.
8. REFER TO "CHEMICAL GROUT APPLICATION NOTES" FOR GROUTING PROCEDURE AND WHAT IS INCLUDED.
9. REFER TO "FRACTURE REPAIR NOTES" FOR IDENTIFICATION OF FRACTURES OR FISSURES AND WHAT IS INCLUDED.
10. REFER TO "CONCRETE REPAIR APPLICATION NOTES" FOR REHAB PROCEDURE AND WHAT IS INCLUDED.

WEXFORD COUNTY ROAD COMMISSION

SPECIAL PROVISION
FOR
CURED-IN-PLACE LINING FOR UV CURE

7-10.1 Description

It is the intent of this specification to provide for the rehabilitation of deteriorated pipelines by the installation of a resin-impregnated flexible tube into an existing sewer, expanding the tube out against the sewer pipe, and curing the tube to form a pipe liner. Curing shall be accomplished by applying ultraviolet light to obtain the desired cure throughout the length of the tube. When cured, the finished liner will extend from end to end of the section being lined to form a continuous tight fitting watertight pipe. This process, which is known as Cured-In-Place Pipe (CIPP) for UV Cure, shall cure into a hard, impermeable liner of the specified thickness and form a structurally sound liner pipe with a uniformly smooth interior. The finished pipe will provide a minimum of 100 percent of the original full flow capacity of the sewer.

CIPP shall meet the requirements of and conform to ASTM F1216. Whenever a sentence in the ASTM F1216, *Standard Practice for Rehabilitation of Existing Pipelines and conduits by the Inversion and Curing of a Resin-Impregnated Tube*, refers specifically to the original pipeline, the liner, the resin, or equipment, materials or methods used for installing, sampling, or testing the CIPP liner, the word "should" shall be replaced by the word "must, shall or will". (Exception: when the word "should" is used for a conditional statement such as "should the pressure…" or "should the temperature…", the word "should" shall not be changed from the original text of ASTM F1216).

References

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

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

ASTM F1743 – Standard Practices for Rehabilitation of Existing Pipelines and Conduits by Pulled-in Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)

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

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

ASTM D5813 – Standard Specifications for Cured-in-Place Thermosetting Resin Sewer Pipe

ISO 178 - Determination of Flexural Properties

DIN 761- Glass Reinforced thermosetting plastics (GRP) pipes

ASTM D3567 - Standard Practice for Determining Dimensions of "Fiberglass" (Glass-Fiber-Reinforced Thermosetting Resin) Pipe and Fittings

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

7-10.2 Materials
The felt liner material shall meet the requirements of ASTM F1216 Section 5.1. The resin material shall conform to ASTM F1216 Section 5.2 and ASTM D5813, and together the cured tube materials shall conform to ASTM D790.

Additionally, the company specializing in manufacturing the Products specified in this section must have at minimum 3 years' experience and ISO-9001 certification prior to bid acceptance.

7-10.2(A) Tube and UV Liner Materials
The tube shall meet the following provisions:

1. The tube material shall meet the requirements of ASTM F2019. Standard felt lining systems are not acceptable.
2. The tube(s) shall have a uniform thickness that when compressed at installation pressures will equal the designed nominal tube thickness.
3. Contractor shall present 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 shall be used in the following locations and as directed by the Engineer after the pipeline has been cleaned and inspected via CCTV per the contract documents:
    a. Each end of the pipe segment
    b. At each section of pipe that has complete or significant wall loss.

The UV liner shall meet the following provisions:

1. For UV products, the finished UV Light Cured Fiberglass pipe liner in place shall be fabricated from materials which when complete are chemically resistant to and will withstand internal exposure to domestic sewage having a pH range of 5 to 11 and temperatures up to 150 F.
2. The liner thickness shall be sized for a minimum hydrostatic and earth load as per design criteria or per ASTM F1216. The earth load and hydrostatic load shall be increased to the structure depth unless otherwise noted as shown on the drawings.
3. All UV cured-in-place fiberglass lining products shall comply with ASTM F2019-03 or the intent thereof as determined by the Engineer, minimum finished liner thickness as defined by design calculation.

7-10.2(B) Resin

The resin shall be a corrosion resistant polyester or vinyl ester resin and catalyst system that when properly cured within the tube composite meets the requirements of ASTM F1216 or ASTM F1743. The resin shall produce a CIPP which complies with or exceeds the structural requirements and chemical resistance requirements of this specification.

The Contractor shall furnish a general-purpose polyester or vinyl ester UV curing resin and catalyst system compatible with the Ultraviolet Light Curing process that provides cured physical strengths specified herein.

The contractor shall submit data and/or a certification from the manufacturer that the resin or resin system is not made of recycled materials.

7-10.2(C) Submittal

At the Preconstruction Conference, the Contractor shall submit Manufacturer's names and specifications for the tube and resin with contact people and phone numbers for each.

The Contractor shall also submit a Bypass Pumping Plan. No construction activities may start prior to WCRC approval of the Bypass Pumping Plan. A Bypass Pumping Plan is to contain the following information:

1. A plan view of the diversion facilities on a site map, including location of pumps, suction and discharge manholes, and layout of discharge piping (may be included as part of the Staging Area Plan)
2. Pump types, sizes, capacities, and placement, for both primary and standby pumps
3. Diversion pipe size and type
4. Design calculations proving the adequacy of the system and selected equipment

5. Power supplies, including standby power source
6. Method of damming the flow
7. Staffing plan including names and telephone numbers of the attendant
8. Noise control plan
9. Approved traffic control plans for bypass pumping around bypass lines

Preparation of Host Pipe
Prior to installing the liner, the Contractor shall provide cleaning and preparation of the existing structure for the repair and shall provide a CCTV inspection of the entire portion to be rehabilitated once it has been cleaned. The Contractor shall clean and clear the existing structure of all roots and other obstructions such as grit, sticks, brush, and rocks. The Contractor shall review the inspection video with WCRC prior to approval to proceed. It is the responsibility of the Contractor to assure that the pipe is carefully cleaned and cleared with methods that will avoid damaging the existing integrity of the pipe, and to restore the integrity of the pipe damaged by the cleaning process to the satisfaction of the Engineer, before proceeding with the lining process. Extra care shall be taken with all existing deteriorated pipes.

Prior to manufacturing and installing the liner, the Contractor shall measure and verify the inside diameter of the host pipe and select the correct size of CIPP liner for the structure.

Additionally, the contractor is responsible for the following items regarding preparation:

1. 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).

2. 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 or extra work.

3. Areas damaged or modified by the work for this project shall be repaired or restored to a condition equal to or better than the original condition. Site restoration is incidental to the work and shall not be regarded as a reason for change orders or extra work.

Notification and Coordination
Scheduling shall be coordinated with Wexford County Road Commission and no work shall be done without County approval.

CIPP Installation
The contractor specializing in performing the work of this section shall be licensed and approved by the manufacturer. Contractor shall have experience with projects of similar size and complexity as this project, minimum of 150,000 feet of installed UV CIPP product within the last 5 years, or otherwise allowed prior to bid acceptance.

The Contractor project Superintendent shall have a minimum of 3 years’ experience as a Superintendent on UV-Cured CIPP projects and have supervised the installation of 100,000 feet

of installed UV CIPP product within the last 5 years, or otherwise allowed prior to bid acceptance. A full time Project Superintendent will be required and MUST be on site at all times throughout the duration of the lining work.

CIPP installation shall be in accordance with ASTM F1216, Section 7 or ASTM F1743, Section 6 with the following additional requirements.

Additionally, the UV Cure CIPP installation shall meet the following provisions:

1. CIPP installation shall be in accordance with ASTM F2019 for UV light Curing Installations. Installation shall be in accordance with manufacturer's recommendations, which shall be available for verification by the Engineer.
2. Curing schedules shall be strictly adhered to, per manufacturer requirements.
3. The CIPP liner shall make a tight fitting seal with the existing pipe. If the CIPP liner fails to make a tight seal, the Contractor shall apply a seal at that point using a sealant or caulking material that is compatible with CIPP materials, watertight, flexible and impervious to hydrogen sulfide.
4. The finished CIPP shall be continuous over the entire length and free from visual defects such as foreign inclusions, dry spots, pinholes, and delamination. If in the opinion of the Engineer, a portion of the liner is inadequate, the Contractor shall correct the defect(s) to the satisfaction of the Engineer.
5. Contractor shall terminate and seal end of CIPP liner to structures using CIPP manufacture approved epoxy.
6. The liner shall be pulled into place via the manufacturer's instructions.
7. The liner shall he inflated with air before curing with Ultra Violet light according to the manufacturer's specifications.
8. The reconstruction tube will be impregnated to meet manufacturer specifications with UV Curing Resins in the manufacturing facility prior to installation. The Contractor shall allow the Owner to inspect the materials before installation.
9. The Pre Impregnated UV Light Fiberglass Liner shall be inserted through one end of the structure and must travel the entire length of the structure by means of a pull in place process utilizing a winch. The Fiberglass Liner shall be inflated in place slightly with air to the manufacturer's specification for installing the UV Chain. Liner cure schedule shall be adhered to per manufacturer's specifications. The Fiberglass liner will then be inspected with a camera mounted on the UV Chain as it is pulled to the end of the liner. After inspection and complete inflation to manufacturer's specifications, the UV light bulbs will be turned on. The curing will commence at a rate specified by the manufacturer according to the total dimensions of the liner.
10. As the liner is curing, the UV Curing System shall record all curing data on a USB thumb drive for the viewing of the Owner.
11. Initial cure shall be deemed to be complete when the UV Chain arrives at the initial entry point of insertion.

7-10.3(A) Structural Requirements
The CIPP shall be designed as per ASTM F1216, Section 6.1 and Appendix XI. The CIPP design shall assume no bonding to the original pipe, assume full deterioration of the host pipe, and shall be classified as Type III, per ASTM D5813, 4.1.2.

Minimum Physical CIPP Properties

CIPP PROPERTY (cured)	STANDARD	RESULTS
Flexural Stress	ASTM D790	25,000 psi
Modulus of Elasticity	ASTM D790	1,000,000 psi

Minimum Wall Thickness Design Parameters

Factor of Safety	=	2.0
Creep Retention Factor	=	50-75%
Ovality	=	2% or as measured by field inspection
Ground Water above Pipe Invert	=	0
Soil Depth above Pipe Crown	=	as specified on the plans
Soil Modulus	=	1000 psi
Soil Density	=	120 pcf
Live Load	=	E80 Loading under railroad tracks
Design Condition	=	Fully Deteriorated
Minimum Service Life	=	50 years
Maximum Deflection	=	5%
Max. Lining Enhancement Factor	=	7

The required structural CIPP wall thickness shall be based as a minimum on the physical properties given or greater if substantiated by independent lab testing and accordance with the design equations and considerations of ASTM F1216, Section 6.1 and Appendix X1.

The wet-out fabric tube shall have a uniform thickness and excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.

The bond between CIPP layers shall be strong and uniform. All layers, after curing must form one homogeneous structural pipe wall with 100 percent resin saturation of all parts of the tube. Layers shall not separate during testing required by this specification, or with physical probing of the layers with a hand powered tool such as a knife blade.

At the Preconstruction Meeting, the Contractor shall submit specifications from the manufacturer for all materials furnished. Certified material test results shall also be included to confirm conformance to these specifications along with a Certificate of Compliance. Materials not complying will be rejected.

7-10.3(B) Field Samples
The Contractor shall also take samples from this project as required under ASTM F1216, and these specifications, and submit them to a Certified Testing Laboratory for testing at the Contractors expense. The Contractor shall take one sample for each diameter and thickness of liner installed. A copy of these test results shall be sent to the WCRC by the Contractor within one week of the completion of the tests. The Contractor shall notify WCRC before samples are taken and allow time and access for the County to observe the sampling and shipment of the test specimens. Final payment will not be made until acceptable test results are received by the Engineer. Field sampling may be waived, but only by WCRC Engineer.

Samples will be prepared and submitted by the Contractor to an independent third party laboratory. The cured sample shall be tested by an independent testing laboratory approved by the Engineer.

Samples used for testing shall be individually labeled to record the following:

1. Contract number and title
2. Sample number
3. Date of installation
4. Location of installation
5. Contractor Name including person responsible for collecting samples
6. Upstream and downstream manhole numbers from where the sample was taken
7. Type of restraint used

7-10.3(C) Inspection
The Contractor shall provide access to the WCRC or its consultant to observe the liner during the installation and curing process. All completed structures shall be inspected with remote televising equipment by the Contractor to show the condition of the rehabilitated structure.

The Closed-Circuit Television (CCTV) equipment used for all inspections, before and after rehabilitation, shall include a remote-controlled color video camera with a tilt and panhead.

All digital video is to be on a USB flash drive and submitted to WCRC. The video submitted shall give a clear visual image of the inside of the pipe and connections without edits or deleted or missing footage (and without the camera passing by flaws or defects in the post-cleaning and post-rehabilitation videos). All digital video files shall be labeled clearly by line segments recorded.

The structure shall be inspected with CCTV again by the Contractor, if deemed necessary by the Engineer, until submitted video provide a detailed visual record of the existing sewer and/or the completed rehabilitation work.

Before final payment, the Contractor shall perform detailed inspection of the completed liner by remote-controlled video equipment. A digital copy of the video inspection shall be submitted to the County immediately following completion in standard USB thumb drive format, compatible

with WCRC viewing equipment, as part of the final acceptance of the project. All digital video files shall be labeled clearly by line segments recorded.

7-10.3(E) Quality Assurance

Products and workmanship shall follow national standards and specifications as required herein. Contractor's personnel involved in installation of pipe liner shall be certified by the liner's manufacturer that they have successfully completed training in handling, insertion, trimming, and finishing pipe liner.

Defects that may occur during construction shall be repaired by the Contractor at the Contractor's expense based on manufacturer's specifications and recommendations, resulting in a finished product meeting the requirements of these specifications. All methods of repair shall be proposed by the Contractor and submitted to the Engineer for review and approval prior to repairs being made. After defects have been corrected another CCTV inspection of the affected line segment shall be completed.

7-10.4(A) Payment

All labor, equipment, and materials associated with the installation of the culvert liner, including mobilization, televising, bypass pumping, pipe cleaning, site preparation and cleanup, along with traffic control, will be paid for as **48"- CIPP Installation, Lump Sum.**

WEXFORD COUNTY ROAD COMMISSION
SPECIAL PROVISION
FOR
MAINTAINING TRAFFIC

A. General. Traffic will be maintained in accordance with the 2020 Standard Specifications for Construction, including any supplemental specifications, and as herein specified. All traffic control devices and their usage shall comply with the 2011 edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD).

The Wexford County Road Commission (WCRC) may perform maintenance work within or adjacent to the Construction Influence Area (CIA). WCRC will coordinate their operations to minimize the interference to the Contractor. No additional payment will be made to the Contractor for the joint use of the traffic control items.

B. Traffic Restrictions:

Conduct all work between sunrise and sunset local time. "Work" is defined as any activity on the project, including set up and take down of traffic control devices. No work shall be permitted on Sundays, holidays, or during special events as defined by the Engineer. Holiday periods are defined as:

Labor Day - 3:00 pm, Friday, 08/29/25 to 6:00 am, Tuesday, 09/03/25

Local traffic shall be maintained at all times.
Commercial and residential driveways shall remain accessible at all times.

C. Traffic Control Devices:

All warning signs shall be 48" x 48" mounted at 5 ft minimum bottom height in uncurbed areas and 7 ft minimum bottom height in curbed or pedestrian areas. All construction signs left in place for a duration exceeding 14 days will be on driven posts as per WZD-100-A. Temporary Traffic Control Devices shall conform to WZD-125-E.

Quantities for traffic control devices have been estimated based on one sequence of Maintaining Traffic Typical M0150a, the detour, plus fifteen (15) W20-3 "Road Closed Ahead" signs to be placed on intersecting roads.

D. Measurement and Payment. Payment for traffic control devices will be included in the Lump Sum Pay item for each project, at each location. Traffic control devices will be in accordance with section 812.04 of the 2020 Standard Specifications and the 2011 Edition of the MMUTCD.

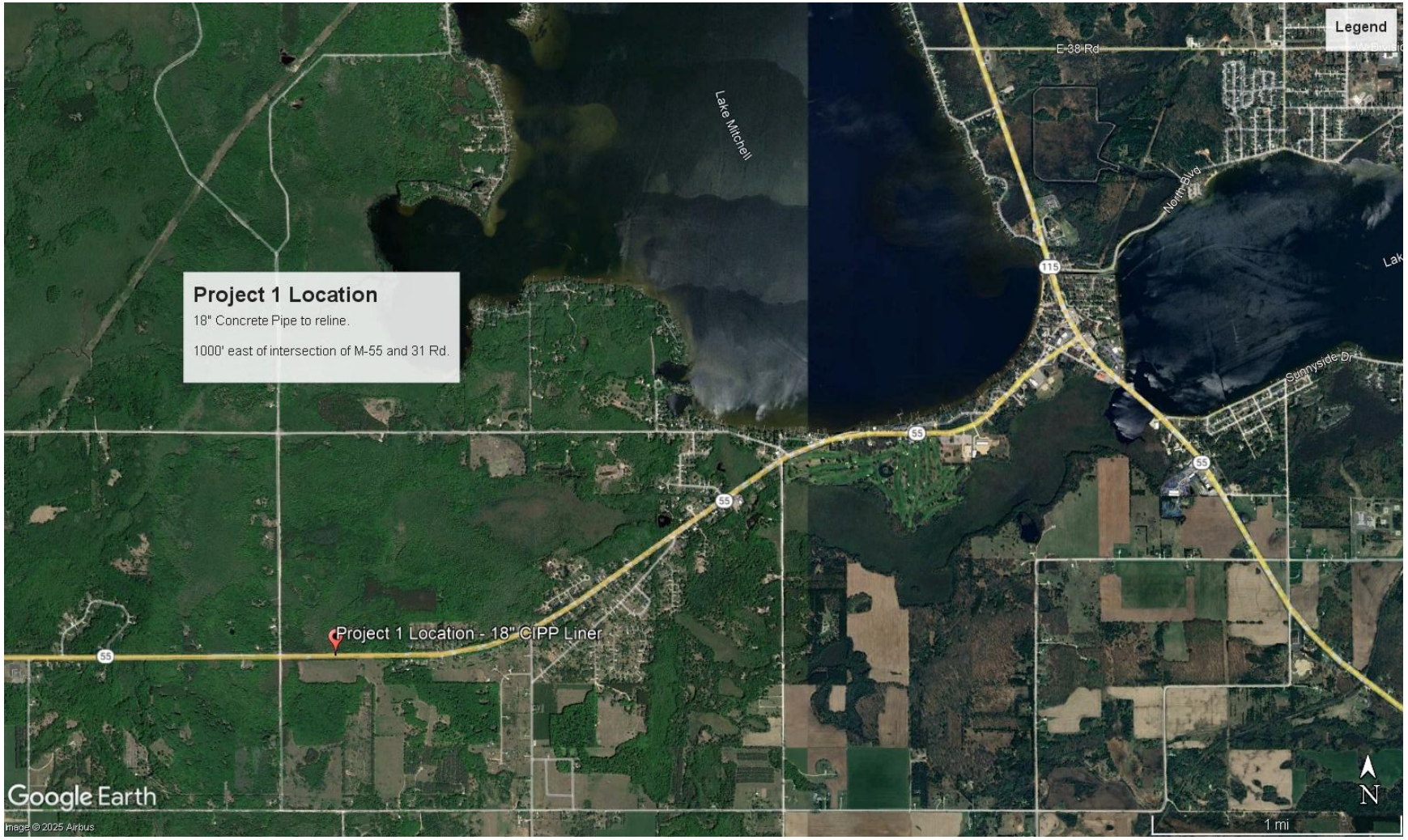
Contract Item	Pay Unit
Project 1, 18" Culvert on M-55	**Lump Sum**
Project 2, 36" Culvert on US-131	**Lump Sum**
Project 3, 48"x42" Culvert Grouting on M-37	**Lump Sum**

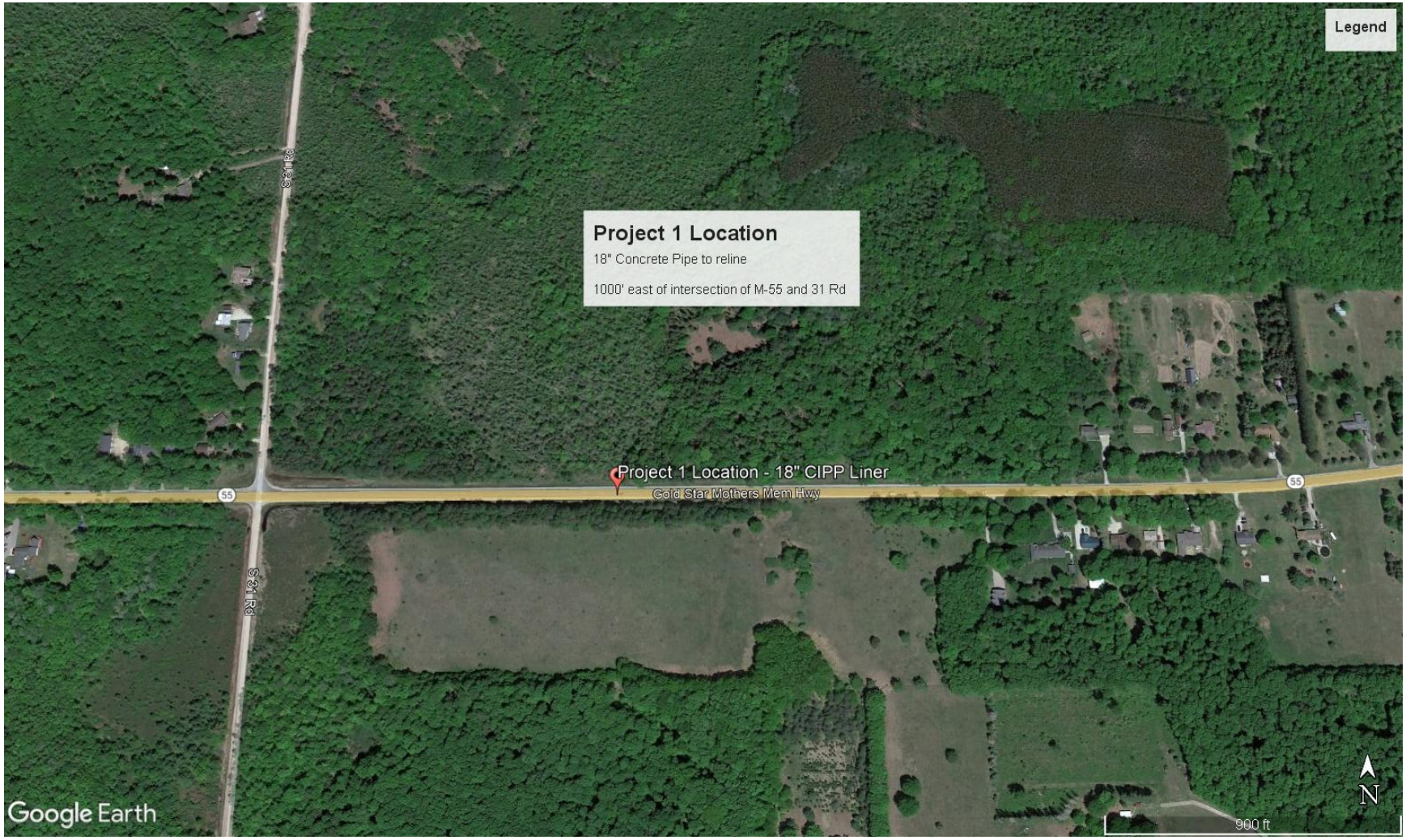
Traffic control devices shall meet the MMUTCD guidelines for a shoulder closure or lane closure with flaggers as required utilizing the items listed below.

Sign, Type B, Temp, Prismatic

Minor Traf Devices
Lighted Arrow, Type C
Traf Regulator Control

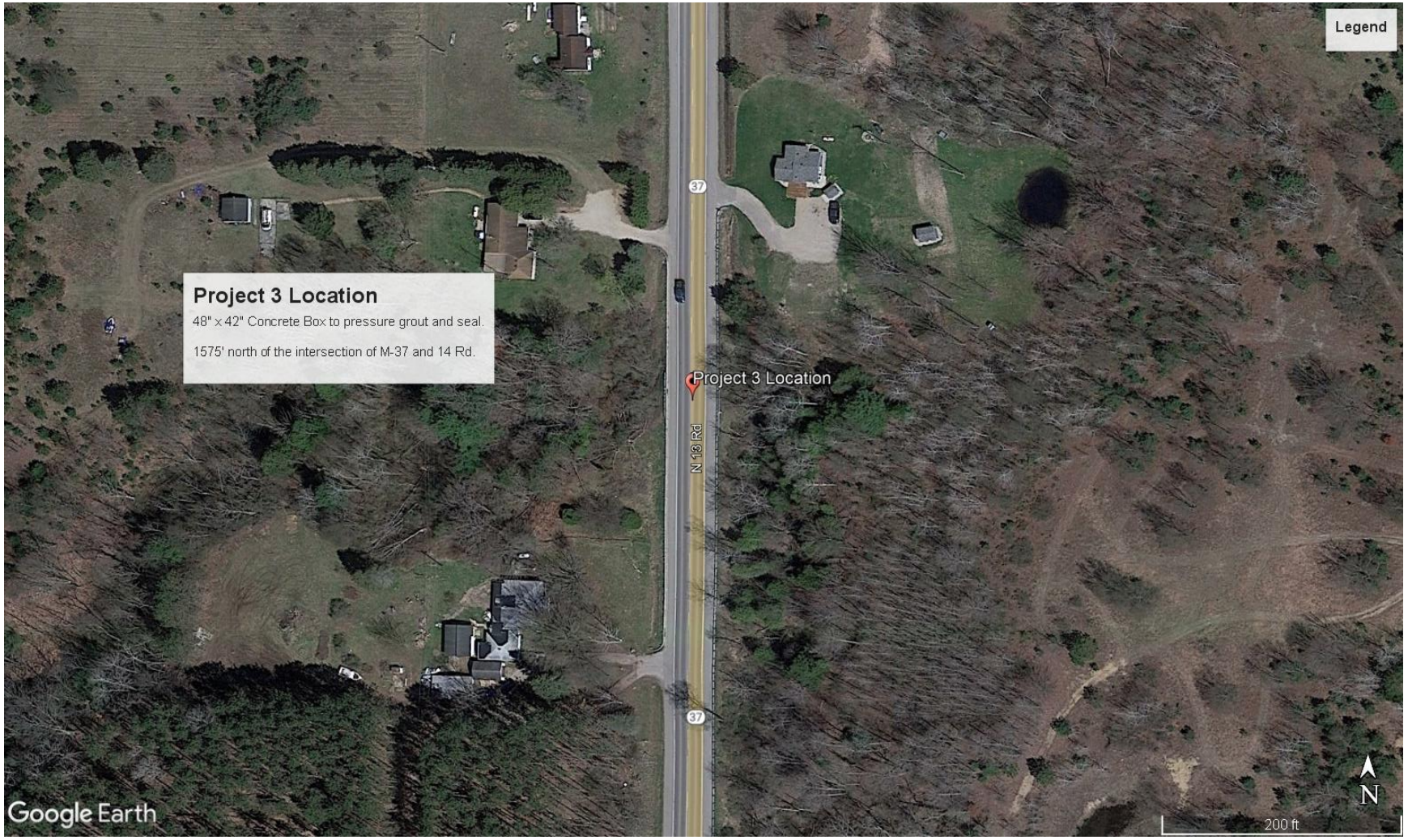
Estimated quantities for the items above are provided for information only. They shall be included in the lump sum price for each project.

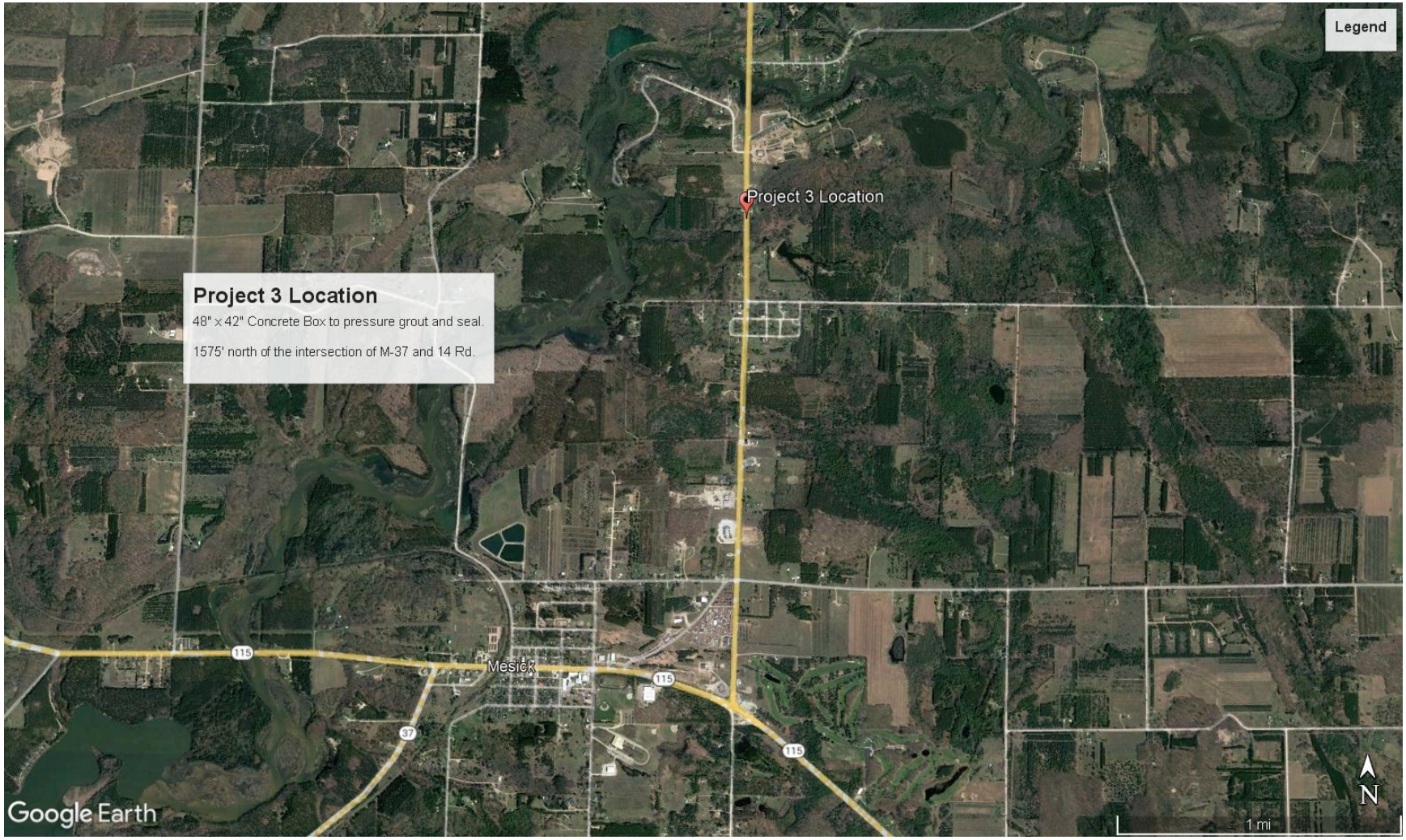

Legend
E-38-Rd
Lake Mitchell
North Blvd
Sunnyside Dr
Project 1 Location
18" Concrete Pipe to reline.
1000' east of intersection of M-55 and 31 Rd.
Project 1 Location - 18" CIPP Liner
55
115
Google Earth
Image © 2025 Airbus
1 mi
N


Legend
Project 1 Location
18" Concrete Pipe to reline
1000' east of intersection of M-55 and 31 Rd
Project 1 Location - 18" CIPP Liner
Gold Star Mothers Mem Hwy
55
55
31 Rd
31 Rd
Google Earth
N
900 ft


Legend
Project 2 Location
36" Concrete Pipe to reline.
5900' Northeast of the intersection of US 131 and Church St.
Project 2 Location - 36" CIPP Liner
Taylor Creek
Taylor Creek
Taylor Creek
Outback Trail
Outback Trail
131
131
131
Google Earth
Image © 2025 Airbus
N
400 ft


Legend
Project 2 Location
36" Concrete Pipe to reline.
5900' Northeast of the intersection of US 131 and Church St.
Project 2 Location - 36" CIPP Liner
Outback Trail
Taylor Creek
131
S Blanchard St
Sessions Dam Rd
Church Rd
Pine St
Cedar St
Church St
Park Rd
South Boardman
Boardman Rd
E Boardman Rd
Boardman Rd
Google Earth
Image © 2025 Airbus
N
1000 ft


Legend
Project 3 Location
48" x 42" Concrete Box to pressure grout and seal.
1575' north of the intersection of M-37 and 14 Rd.
Project 3 Location
37
N 14 Rd
37
Google Earth
N
200 ft


Legend
Project 3 Location
Project 3 Location
48" x 42" Concrete Box to pressure grout and seal.
1575' north of the intersection of M-37 and 14 Rd.
Mesick
115
37
Google Earth
N
1 mi