HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

535 Griswold Street
Buhl Building, Suite 1650
Detroit, MI 48226

313-965-3330

www.hrcengr.com

ADDENDUM NO. 1
TO SPECIFICATIONS FOR:
SEWER SYSTEM IMPROVMENTS
CITY OF MARYSVILLE, MICHIGAN

Issued: April 10, 2026 HRC Job No. 20250698

Intent:

This Addendum No. 1 is issued prior to receipt of proposals to provide for certain changes and clarifications to the Specifications, as herein specified, and is hereby made a part of the Contract Documents and shall be taken into consideration in preparing the Proposal. All other conditions remain the same. **The Proposer shall acknowledge the receipt of this Addendum by signing below, including this addendum with their proposals, and completing the Addenda section on the Proposal Form (Section 00300).** Failure to acknowledge the Addenda Section of the Proposal Form in the submission of the proposal may be justification for the proposal being rejected as non-responsive. The following lists the extent of this Addendum.

Pre-Bid Meeting held on 04/01/2026: Meeting Minutes have been included in this Addendum.

Specifications Revised and Reissued:

- Specification Section 00010 – Index
  - Addresses added section.
00702	Enrolled House Bill No. 5541
00703	Enrolled House Bill No. 5607
00704	Enrolled Senate Bill No. 1024
00707	Certification Regarding Lobbying
00800	General Supplementary Conditions
00851	Davis-Bacon Wage Requirements
00853	Build America Buy America Material Requirements
- Specification Section 00120 – Instructions to Bidders
  - Updated bid evaluation statement. Included definition for successfully completed project.
  - It is the intention of the Owner to award this Contract to a Bidder fully capable, both financially and with regard to experience to perform and complete the Work in a satisfactory manner. **The City intends to award the project to the lowest responsive, responsible bidder with a recent history of successfully completed projects that were completed within the authorized schedule and budget.** If required by the Owner, each Bidder under consideration may be required to furnish the Owner, within 48 hours at the Owner's request, the following information sworn to under oath by them:
  - 4. A description of any similar project which Bidder has constructed in a satisfactory manner. Successfully or satisfactorily completed projects are those that were completed within the authorized schedule and budget.
- Specification Section 00200 – Coordination Clause
  - Removed requirement of proposed project schedule to be submitted with the bid.

- PROJECT SCHEDULE CONSIDERATIONS

  ~~Each Bidder shall submit with their bid a proposed construction schedule demonstrating the Bidder's plan to complete the project's scope of work within the time allowed in the Proposal and to achieve the completion of any milestones identified in the Contract Documents. The Bidder's proposed construction schedule shall provide an orderly progression of the Work to completion within the Contract times. The proposed construction schedule shall outline major project milestones including completion dates and shall be sufficiently detailed to enable the Engineer to evaluate the Bidders plan and ability to complete all the aspects of the Work within the Contract time periods. It is expected that once started, Work will proceed continuously until it is completed.~~

  ~~Substantial and Final Completion shall be in accordance with the TIME OF COMPLETION article within the Proposal (Section 00300).~~

  ~~Failure to provide the requested schedule may result in the Contractor being declared non responsive.~~

  The sequence of construction activities described herein are provided for the Contractor's consideration when developing a project schedule. The Contract includes a single Contract Completion Date, and the Contractor has the flexibility to perform the Work in any sequence that optimizes labor availability, material acquisition, and overall project efficiency except as noted as follows.

  Rehabilitation work involving CIPP lining and/or chemical joint grouting is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.

  Certain work locations such as within MDOT rights-of-way or areas identified in Section 02030 – Sequence of Construction and special Project Requirements require specific coordination and sequencing which must be considered for developing a project schedule.

- Specification Section 00250 – Experience and Qualifications Statement.
  - Included definition for successfully completed project.
  - 1. Contractor must have successfully completed 10 similar projects within the United States over the last **five (5) years** with full-length cured-in-place pipe (CIPP) projects. Successfully completed projects are those that were completed within the authorized schedule and budget.
- Specification Section 00300 – Proposal
  - Updated list of complete bid submittals. Updated bid evaluation statement.
  - **COMPLETE BID**

    The following items shall be submitted for the bid to be considered complete:

    1. Completed proposal form on owner supplied sheets
    2. Bid Bond
    3. Signed acknowledgement of any addenda
    4. Signed Coordination Clause (Section 00200)
    5. Completed Experience and Qualifications form (Section 00250)
    6. Signed Debarment, Suspension, and Other Responsibility Matters Certificate(Section 00460)
    7. Signed "Iran Linked Business" Vendor Certification (Section 00704)
    8. Signed Certification Regarding Lobbying (Section 00707)
    9. Name and Qualifications of Contractor who will be performing the bypass pumping (Section 02141)
    10. Styrene Odor Control Plan (Sections 02708 and 02709)
    11. Preliminary design of CIPP liner (Sections 02708 and 02709)
  - The Owner, at its sole discretion, reserves the right to award to the Bidder who, in the sole determination of the Owner, will best serve the interest of the Owner. The Owner reserves the right to accept any Bid, to reject any or all Bids, to waive any and all informalities involving price, time, or changes in the Work, and to negotiate contract terms with the successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. However, it is the intention of the Owner to award the ~~low total Bid to one Bidder~~ **project to the lowest responsive, responsible bidder with a recent history of successfully completed projects that were completed within the authorized schedule and budget**. Also, the Owner reserves the right to reject the Bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified, of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Owner.
- Specification Section 00707 – Certification Regarding Lobbying
  - Section added to include federal requirements certification regarding lobbying.
- Specification Section 02030 – Sequence of Construction and Special Project Requirements
  - Updated notification to CSX prior to any work being performed from 72 hours to 30 working days.
  - Updated advance notification to Engineer for work within MDOT right-of-way to be seven (7) business days. Updated notice of completion to Engineer for completed work within the MDOT right-of-way to be within five (5) days.

- 4. The Contractor shall coordinate with CSX personnel to ensure CSX staff are available during rehabilitation Work occurring within the CSX railroad right of way. The Contractor shall provide the City and Engineer at least 30 working days' notice prior to working on pipes 5220, 5474, and 5481, as the City must provide 30 working days' notice to CSX to allow time for assignment of railroad inspector. Such notification to CSX will only be accepted from the Owner of the undercrossing, or the Owner's duly authorized agent; CSX will not accept notifications submitted by the Contractor. If a Railroad Inspector cannot be made available, adjustments to the Work schedule may be required.
- 3. Coordinate with MDOT for all permitted Work within road rights-of-way under their jurisdiction. Provide all required notifications to MDOT prior to performing any activities that may interfere with traffic operations as required by the MDOT permit. Advanced notice for permitted activities must be submitted to the Engineer at least seven (7) business days prior to the commencement of work.
- 4. Submit a Completion Notice to the Engineer within five (5) days of work being completed.

≡ Specification Section 02141 – Temporary Bypass Pumping
- Included compliance requirements for EGLE's Part 41 permit.
- B. A detailed description of the bypass pumping and/or flow control plan that will be used during the project, with supporting calculations, shall be submitted via the permit schedule in MiEnviro for EGLE review and approval prior to implementation. Bypass pumping and/or flow control measures may not begin until EGLE has approved the plan, which may take up to **four (4) weeks**. An email notification shall be made to the Warren District Supervisor within one (1) week of the submission.

≡ Specification Section 02708 – Full-Length CIPP Installation
- Included design requirements for CIPP lining crossing underneath CSX railroad.
- 3. Railroad live loads shall be designed using Cooper E-80 Loading. Railroad load requirements are also provided in Section 3.2.3 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).

≡ Specification Section 02709 – Sectional CIPP Installation
- Included design requirements for CIPP lining crossing underneath CSX railroad.
- 3. Railroad live loads shall be designed using Cooper E-80 Loading. Railroad load requirements are also provided in Section 3.2.3 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).

≡ Specification Section 02990 – Permits
- Included issued MDOT ROW Permit.
- **Note that the permit expires April 2, 2027.**

Appendices Revised and Reissued:

≡ Appendix B – Sanitary Sewer Rehabilitation Table
- Included upstream and downstream manholes depths. Shaded pipe segments that require special access requirements and within MDOT right-of-way

General – Bidder Questions:

1. Question: Will HRC be doing the layout, or is the contractor responsible for that?
   Answer: Layout is not required as it is a sewer lining/grouting job.

2. Question: CIPP Liner Thickness calculations require depth of cover for each run of pipe to be lined. Can HRC please supply the depths of the manholes identified in Appendix B?
   Answer: Yes, we will address this within Appendix B in an addendum.

3. Question: Was the 30 days' notice of cancellation just for the railroad protective liability?
   Answer: **The notice of cancellation requirement is for the general liability insurance.**

4. Question: Will any costs associated with CSX coordination be the responsibility of the Contractor?
   Answer: No, the City will directly handle the costs associated with obtaining the CSX railroad agreement and inspector fees.

5. Question: Was the listed MDOT pipes discussed during the meeting in addition to the list provided in Appendix B?
   Answer: No, Appendix B includes all work designated in our proposed scope, including work within MDOT right-of-way.

6. Question: Segment 5220, which is the segment that segment 6308 directly ties into, is not in the contract documents. What is the diameter of that pipe segment?
   Answer: Pipe segment 5520 is verified to be a 10-inch diameter pipe.

7. Question: Regarding the access route for pipes 5386, 5387, and 5388 and rehabilitation to occur during firmer ground conditions, when is the usual rainy season in Michigan?
   Answer: Spring, early summer, fall and late fall, are the seasons with the most anticipated wet weather conditions.

8. Question: Regarding the access route for pipes 5386, 5387, and 5388, does the sewer line run all the way to Michigan Avenue?
   Answer: The sanitary sewer extends to Michigan Avenue, but the City would like the Contractor to use the established route from Gratiot Boulevard to the location to the three (3) pipe segments.

9. Question: Regarding the access route for pipes 5386, 5387, and 5388, will light/minimal tree trimming be allowed to provide clear access to these pipe segments?
   Answer: City stated they had no issue with tree trimming if it is within the prescribed sewer easement.

10. Question: Regarding the access route for pipes 5386, 5387, and 5388, will the contractor be fully responsible for all material/equipment required to provide access at this location?
    Answer: The City intends to help aid with this location. This involves using asphalt millings to fill in spots of uneven terrain that are susceptible to standing water. The City also offered to help remove the gate currently within the established route.

11. Question: Will there be any addendums posted? If so, when?
    Answer: Yes, there will be an addendum posted no later than Friday April 10, 2026.

12. Question: Can the City provide access route for pipes 5386, 5387, 5388 (Where can we find attachment 3.3.A)?
    Answer: The attachments referred to in Section 02030 are located in that specification at the end of the spec. Refer to spec 02030 / 7 for the list of attachments that are IN that spec.

13. Question: Where can we find attachment 3.3.C?
    Answer: The attachments referred to in Section 02030 are located in that specification at the end of the spec. Refer to spec 02030 / 7 for the list of attachments that are IN that spec.

14. Question: Can a GIS map be provided?
    Answer: The GIS maps are included in Appendix A.

15. Question: What is the estimated cost of this project?
    Answer: The estimated cost is not being published.

16. Question: Are union bids required for this project?
    Answer: As indicated in Specification 00851, the project requires compliance with the Davis Bacon and Related Acts, including payment of prevailing wages as prescribed by the U.S. Department of Labor.

17. Question: Can I get a copy of the updated plan holder list?
    Answer: Plan holder list is on HRC's website: https://www.hrcengr.com/bid-info/

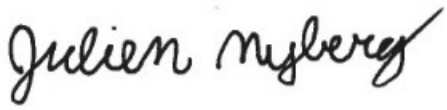
Attachments:

1. Pre-Bid Meeting Minutes from 04/01/2026.
2. Specifications revised and reissued.
3. Appendix B revised and reissued.

If you have any questions or require any additional information, please contact the undersigned.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.



Julien Nyberg
Graduate Engineer I, EIT

JNN/JLM

pc: All Plan Holders
City; S. Quain,
HRC; J. VanDeCreek, File

Received and Acknowledged By:

Signature: _____

Written Name: _____

Title: _____

Dated: _____

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

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Bloomfield Hills, MI 48302-0360

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MEETING MINUTES
For
SEWER SYSTEM IMPROVEMENTS
CITY OF MARYSVILLE
PRE-BID MEETING

Date: April 1, 2026
Time: 10:00 AM
Meeting Location: Marysville City Hall

HRC Job No. 20250698

Attendee Name	Representing	Phone No.
Todd Postill	City of Marysville	(810) 650-9528
Jennifer Morreale	Hubbell, Roth & Clark	(248) 535-3320
Julien Nyberg	Hubbell, Roth & Clark	(313) 530-4272
Neil Stevenson	Pamar Enterprises, Inc.	(954) 931-6569
Zach Rose	Pipeline Management	(248) 685-1500
Jason Everaert	SAK Construction	(519) 965-0133

MEETING ITEMS

The purpose of this pre-bid meeting is to review the requirements and details for the Marysville Sanitary Sewer System Improvements project and answer all Contractor questions.

1. Introduction.
    a. City of Marysville Personnel (the City, or Owner).
        i. Todd Postill, Department of Public Works
    b. Hubbell, Roth & Clark Personnel (HRC, or the Engineer).
        i. Jennifer Morreale, Project Manager.
            1. Phone: (248) 535-3320
            2. Email: jmorreale@hrcengr.com
        ii. Julien Nyberg, Graduate Engineer. Primary Project Contact.
            1. Phone: (313) 530-4272
            2. Email: jnyberg@hrcengr.com

2. Project Summary.
    a. Pipe Rehabilitation.
        i. Approximately 4,141 linear feet of Full Length CIPP.
        ii. Approximately 47 patches of SCIPP.
        iii. Approximately 256 pipe joint repairs via chemical grout.
        iv. Work Location Maps (Appendix A)→ Work Summary Tables (Appendix B).
            1. Appendix B has been updated to include upstream and downstream manhole depths to help facilitate CIPP liner thickness design. See handout.
    b. Incidental Items, including but not limited to:
        i. Temporary By-Passing / Flow Control.
        ii. Debris disposal – Debris to be collected and disposed offsite
        iii. Reinstating lateral connections.
        iv. Testing.

v. Post-Installation T.V. Inspection with PACP Reporting.
vi. Clean-up.
vii. Restoration.

3. Important Dates.
    a. Questions due – Wednesday April 8, 2026 by 5:00 p.m.
    b. Addendum posted – Friday April 10, 2026.
    c. Bids due – Thursday April 16, 2026 by 1:00 p.m.
    d. Substantial Completion – May 18, 2027.
    e. Final Completion – June 1, 2027.

4. Review of Permits (Refer to Section 02990).
    a. EGLE Part 41 Permit.
    b. MDOT ROW Permit.
    c. CSX Transportation Railroad Agreement.
    d. Each permit is being applied for by the Owner and will be coordinated with how the Contractor will obtain the permits.

5. Special Project Requirements (Refer to Section 02030).
    a. Access Route to Pipes 5386, 5387, and 5388 (AKA "the Bromley Line")
        i. Lump sum item provided to handle any additional material, equipment, and labor required to provide access to the site of pipes 5386, 5387, and 5388.
        ii. The City intends to help aid with this location. This involves using asphalt millings to fill in spots of uneven terrain that are susceptible to standing water. The City also offered to help remove the gate currently within the established route.
    b. Railroad Crossing Access for Pipes 5220 (concrete in casing), 5474 (ductile iron no casing), and 5481 (clay, casing is unknown).
        i. 3 locations where pipes cross under railroad. City/Engineer are currently working to obtain an agreement for these locations. CIPP design have to be in compliance with ASTM standards. CSX will need to review the design prior to issuing an agreement. Railroad live loads to be designed using Cooper E-80 loading. Additionally, these liners must be less than 2 inches thick and 2 of the 3 pipes must be able to handle all external loading (page 11, 16 and 29 of CSX Specs).
        ii. Appendix B was reissued to include manhole depth and the depth for the pipes crossing the railroad is the largest depth between the manhole depth and the depth under the railroad.
    c. Residential Rear Yard Access to Pipes 5378, 6252, 5905, and 5081.
        i. Specific locations require manhole access points located in residential rear yards. These locations are identified in Section 02030 in the specs. Coordination between the Contractor and resident is required before any work in these locations can be performed.

6. Regulatory Requirements Affecting the Project.
    a. This project is funded by the EPA's Congressionally Directed Spending (CDS) Grant, which requires compliance with the following standards:
    b. Davis Bascon Act and Prevailing Wages (Section 00851).
        i. Wages and DBA Poster provided in Section 00851).
    c. Build America, Buy America Requirements (Section 00853).
        i. Required for any construction materials to be installed. Must be American made/fabricated, unless a waiver can be approved.
    d. Certification Regarding Lobbying (Section 00707).
        i. All recipients and contractors under the grant cannot be involved in any federal lobbying

activities.

7. Review of Contract Documents.
    a. Refer to Section 00300 for all items to be submitted with the bid.
        i. Completed proposal form on owner supplied sheets (Section 00300).
        ii. Bid Bond (Section 00300).
        iii. Signed acknowledgement of any addenda (Section 00300).
        iv. Signed Coordination Clause (Section 00200).
        v. Completed Experience and Qualifications form (Section 00250).
        vi. Signed Debarment, Suspension, and Other Responsibility Matters Certificate (Section 00460).
        vii. Signed "Iran Linked Business" Vendor Certification (Section 00704).
        viii. Name and Qualifications of Contractor who will be performing the bypass pumping (Section 02141).
        ix. Styrene Odor Control Plan (Sections 02708 and 02709).
        x. Preliminary design of CIPP liner (Sections 02708 and 02709).
        xi. Note, upon further correspondence with the EPA, Section 00707 includes a certification regarding lobbying that must also be signed with and submitted with the bid. This will be updated in the addendum.
        xii. Note, Section 00200 indicates that a construction schedule is required to be submitted with the bids and that will be removed when we issue the addendum. The construction schedule is NOT required to be submitted with the bids. This will be updated in the addendum.
    b. The successful bidder will be required to provide the following.
        i. A Performance Bond, Labor and Material Bond, and Maintenance and Guarantee Bond will all be required as part of the signed Contract (Sections 00500, 00610, 00620, 00630).
        ii. Insurance must be provided for this project as part of the signed Contract per the General Supplementary Conditions (Section 00800).
            1. Workers' Compensation.
            2. Comprehensive General Liability.
            3. Comprehensive Automobile Liability.
            4. Owner's Protective.
            5. Builder's Risk and Installation Floater.
            6. Umbrella or Excess Liability.
            7. Railroad Protective Liability.
            8. Other Requirements.
                a. At least 30 days' notice of cancellation.

8. Critical Work Sequencing.
    a. General scheduling of rehabilitation work – Contractor can develop their schedule per their discretion that will best meet the substantial completion date of 5/18/27 except special consideration should be given to the following:
        i. Access route to pipes 5386, 5387, and 5388 – this work needs to occur during firmer ground conditions.
        ii. Work within MDOT road right of ways – notification protocol is required 5 working days prior to working in the MDOT ROW
            1. List of nine (9) Pipe IDs:
                a. 6097
                b. 5403
                c. 5481
                d. 5660
                e. 5877

f. 5220
g. 5221
h. 5714
i. 5426

iii. Railroad crossing access for pipes 5220 (SCIPP in casing), 5474 (FCIPP + grouting, Cast Iron section), and 5481 (SCIPP, casing unknown).
1. City is currently obtaining CSX agreements for these crossings.
2. Once agreement is received, the notification protocol is that CSX requires a minimum of 30 working days' notice prior to the work along with coordination with CSX as inspector must be on site during the work.
3. Once we have the CSX agreement in place, then the pipes can be scheduled for cleaning and televising. This work requires railroad inspectors to be on site.
4. Once the pipes are cleaned and televised, then the required rehabilitation can be finalized and the Contractor will need to submit the design calculations for review by CSX as part of the "outside party request" (OPR).
5. The OPR process can take 2 to 3 weeks.
6. 30 days' notice would be required to schedule the actual rehab once the OPR is approved.
7. The 3 railroad crossings should be prioritized and grouped together to optimize coordination between all parties involved (Contractor, City/Engineer, CSX).

9. Coordination with Known Construction Project Within Area
a. The following is a construction project within the local vicinity that may have an impact on this project.
i. Pennsylvania Ave Water Main Replacement & Road Rehab Project (BMJ JN: 2504.16). This project is on Pennsylvania Ave between Huron and 17th Street, and on 15th Street between Colorado Ave and Michigan Ave.
ii. Project was awarded in March 2026 and should be starting in the next month or two and is anticipated to take 6 to 8 months to construct.
iii. The Contractor for this project is Murray Underground Systems Inc.
iv. The project is beginning in April 2026 and has an expected duration of 2 to 3 months to substantial completion.
b. There is an MDOT construction project along Gratiot Boulevard from Range Road to Ravenswood Road that will be excavating the road and impacting traffic along the entire roadway. The City currently does not have any additional information regarding the contractor involved with the project or the timeframe.
c. The Contractor shall coordinate their Work on this project with that by the Contractor on other projects, and as directed by the Engineer.

10. Use of Premises by Owner and Contractors.
a. Owner's normal allowable working hours in the City of Marysville are also included in Specifications 00200 and 02030, which are 7:00 a.m. to 5:00 p.m. on weekdays only.
b. Work outside of these hours and on weekends must be approved by the City.

11. Temporary Utilities Provided by Contractor and by Owner.
a. Water can be provided to the Contractor by the City. This is to be obtained at the Department of Public Works (DPW) located at 200 E 14th Street, Marysville, Michigan 48040.
b. City hydrants are NOT permitted to be used without authorization from the City.
i. Use of hydrants can be addressed with the City during construction if deemed necessary.

12. Crew Days (Refer to Section 01421)
    a. An onsite construction observer from HRC will be on site for the duration of construction.
    b. Coordination with HRC's observer and the engineer is necessary to schedule the observer accordingly.
    c. Each 8-hour day is a crew day and hours in excess of 8 hours per day will be a fraction of a crew day.
    d. 24-hours' notice is required prior to any changes in contractor's work force or operations.
    e. Cancellations less than 24-hours in advance will result in at least half a crew day to be deducted from the crew days listed in the contractor's proposal.
    f. Please note: *If the work under the contract is incomplete when the contractor has expended the number of crew days slated in their proposal, subsequent payments to the contractor shall include a deduction item in the amount of the cost for each excess crew day used during the period covered by the payment.*

13. Responsibility for Testing.
    a. All testing required for this project will be the responsibility of the Contractor and to follow compliance as per the Specifications.
        i. Materials/Products – Manufacturer's must perform tests and submit certified test reports.
        ii. Bypass-pumping/flow control - Leakage and pressure testing (02141, 3.3 B).
        iii. CIPP:
            1. Site Samples – Flexural and tensile testing repots of CIPP from last three projects in which testing was completed (02708, 1.6 E).
            2. Testing for chemical resistance shall be at the Owner's request (02708, 2.1 E).
            3. Post-Installation CIPP testing required by Contractor using an approved licensed third-party testing company.
                a. Gravity pipe leakage testing (02708, 3.10 B).
                b. Short-term flexural testing (02708, 3.10 C).
                c. Delamination testing if post-installation inspection deems necessary (02708, 3.10 C).
        iv. Grouting – Pre- and post- pipe joint sealing pressure testing (02765, 1.11 D).

14. Post Meeting Site Visit.
    a. Following the conclusion of this meeting, the City will take any Contractors interested in visiting the site location for Pipes 5386, 5387, and 5388.
    b. The City drove out all bidders that attended the pre-bid meeting.

15. Contractor Questions.
    a. Responses will be provided in the Addendum.
    b. Any additional questions may be emailed to HRC as noted on the Advertisement, which is jmorreale@hrcengr.com. Questions can be submitted until 5:00 p.m. on April 8, 2026. Questions will be answered via Addendum.
    c. Questions from the pre-bid meeting:
        1. Was the 30 days' notice of cancellation just for the railroad protective liability?
            a. The notice of cancellation requirement is for the general liability insurance.
        2. Will any costs associated with CSX coordination be the responsibility of the Contractor?
            a. No, the City will directly handle the costs associated with obtaining the CSX railroad agreement and inspector fees.
        3. Was the listed MDOT pipes discussed during the meeting in addition to the list provided in Appendix B?
            a. No, Appendix B includes all work designated in our proposed scope, including work within MDOT right-of-way.

4. Segment 5220, which is the segment that segment 6308 directly ties into, is not in the contract documents. What is the diameter of that pipe segment?
   a. **Pipe segment 5520 is verified to be a 10-inch diameter pipe.**
5. Regarding the access route for pipes 5386, 5387, and 5388 and rehabilitation to occur during firmer ground conditions, when is the usual rainy season in Michigan?
   a. **Spring and early summer are the seasons with the most anticipated wet weather conditions.**
6. Regarding the access route for pipes 5386, 5387, and 5388, does the sewer line run all the way to Michigan Avenue?
   a. **The sewer line does run all the way to Michigan Avenue, but the City would like the Contractor to use the established route from Gratiot Boulevard to the location to the three pipe segments.**
7. Regarding the access route for pipes 5386, 5387, and 5388, will light/minimal tree trimming be allowed to provide clear access to these pipe segments?
   a. **City stated they had no issue with tree trimming if it is within the prescribed sewer easement.**
8. Regarding the access route for pipes 5386, 5387, and 5388, will the contractor be fully responsible for all material/equipment required to provide access at this location?
   a. **The City intends to help aid with this location. This involves using asphalt millings to fill in spots of uneven terrain that are susceptible to standing water. The City also offered to help remove the gate currently within the established route.**

These minutes are intended to be a summary of those items discussed. Any corrections and/or comments should be noted to the writer as soon as possible.

Respectfully submitted,

HUBBELL, ROTH & CLARK, INC.

Julien Nyberg

Julien Nyberg
Graduate Engineer I
4/3/2026

JNN/jlm

Attachment: Meeting Sign-In Sheets

pc: All present
City; Q. Bishop, M. Booth, S. Quain
HRC; J. VanDeCreek, File

HUBBELL, ROTH & CLARK, INC
CONSULTING ENGINEERS SINCE 1915

555 Hulet Drive
Bloomfield Hills, MI 48302-0360

248-454-6300

www.hrcengr.com

Meeting Sign-In Sheet

Project Name: Sewer System Improvements **Date of Meeting:** April 1, 2026, 10:00 am

Purpose of Meeting: Pre-Bid Meeting

For the Township/City/Village of: City of Marysville

Location of Meeting: 1255 Delaware Avenue, Marysville

No.	Name	Agency/ Company	Phone Number	Email
1	Jennifer Morreale	HRC	(248) 535 - 3320	jmorreale@hrcengr.com
2	Julien Nyberg	HRC	(313) 530 - 4272	jnyberg@hrcengr.com
3	Neil Stevenson	Pamar Ent. Inc.	954 931 6569	neil@pamarenterprises.com
4	Zach Rose	Pipeline Management	248-685-1500	zach.rose@pipeline.us.com
5	Jason Everaert	SAK	519-965-0133	je.veraert@sakcon.com
6	Todd Still	Marysville DPW	810-650-9528	TBStill@cityofmarysvillemi.com
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INDEX

END OF SECTION

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SECTION 00120

INSTRUCTIONS TO BIDDERS

SCOPE OF WORK

The Work under this Contract shall consist of the furnishing of all labor, material, equipment, services, and all incidental items necessary to complete the Project in accordance with the Contract Documents.

OBSERVATION OF SITE

Before submitting a Proposal, each Bidder shall personally inspect the site of the proposed Work to arrive at a clear understanding of the conditions under which the Work is to be done.

Sewer videos and pipe reports were obtained as part of previous investigations (SAW Grant) between 2016 and 2019 and can be found at the link below. The Owner and Engineer do not guarantee that the conditions shown in the videos and reports represent the current condition of the pipes shown.

https://bit.ly/3McU9IZ

The Contractor shall be held to have compared the premises with the Drawings and Specifications and to have satisfied themselves as to the conditions of the premises, existing constructions, and any other conditions affecting the carrying out of the Work, before delivery of their Proposal.

No allowance or extra consideration on behalf of the Bidder will subsequently be allowed by reason of error or oversight on the part of the Bidder or on account of interferences by the Owner's or by other Bidder's activities.

SOIL CONDITIONS

The Contractor, such and as Bidder, shall make their own determination as to soil and/or rock conditions and they shall complete the Work in whatever material and under whatever conditions they may encounter or create, without extra cost to the Owner. This shall apply whether or not borings are shown on the Drawings.

All Bidders conducting soil tests shall restore the area of their testing to original condition as closely as possible.

The Owner does not guarantee that the ground encountered during construction will conform with any boring information furnished in this Section.

The Owner and Hubbell, Roth & Clark, Inc. may have been involved in the design, observation, and/or construction of other underground projects in the area of the proposed construction. The observation reports, soil reports, and any soil information connected with these projects are available for construction observation and review by the prospective bidders.

ADVERTISEMENT

The published Advertisement for the proposed Work contains information necessary to bidders. A copy of the Advertisement shall be considered a part of the Instructions to Bidders as fully as if repeated in this Section.

PRE-BID MEETING

A (non-mandatory) pre-bid meeting has been scheduled for **Wednesday April 1, 2026 at 10:00 am**., at the at the Marysville City Hall, 1255 Delaware Ave, Marysville, MI 48040. This meeting will be attended by the Owner, Engineer, and other interested parties. At this meeting, questions regarding the bid documents will be answered. Contractors will be allowed to inspect the work sites before or after the meeting. Immediately following the pre-bid meeting, the Owner will escort bidders to the location of Pipes 5386, 5387, and 5388 to identify the Work that requires access planning. Bidders shall consider all conditions presented during this site review when preparing their proposals

PROPOSALS

Proposals will be received in accordance with the Advertisement for Bids and shall be submitted only on forms provided by the Engineer.

Proposals shall be enclosed in sealed envelopes marked with the name of the Project and bidder and shall be delivered to the designated location on or before the bid time as specified in the Advertisement for Bids.

Proposals shall be made in full conformity with all the conditions set forth in the drawings and in these specifications. Bids are firm and cannot be withdrawn for a period of **90** days after opening of the bids, unless otherwise specified in the Advertisement for Bids.

NAME AND STATUS OF BIDDER

The name and legal status of the bidder, either as a corporation, partnership, or individual, shall be stated in the Proposal.

Anyone signing a Proposal as an agent of another or others, shall submit with the Proposal, legal evidence of their authority to do so.

The place of residence of each Bidder, or the office address and telephone number in the case of a firm or company, with County and State, shall be given after their signature.

BIDDER'S QUALIFICATIONS

It is the intention of the Owner to award this Contract to a Bidder fully capable, both financially and with regard to experience to perform and complete the Work in a satisfactory manner. **The City intends to award the project to the lowest responsive, responsible bidder with a recent history of successfully completed projects that were completed within the authorized schedule and budget.** If required by the Owner, each Bidder under consideration may be required to furnish the Owner, within 48 hours at the Owner's request, the following information sworn to under oath by them:

1. Performance record.

2. The address and description of the Bidder’s plant and place of business.

3. Itemized list of equipment available for use on the Project.

4. A description of any similar project which Bidder has constructed in a satisfactory manner. Successfully or satisfactorily completed projects are those that were completed within the authorized schedule and budget.

5. A certified or authenticated financial statement dated within sixty days prior to the opening of bids. The Owner may require that any items of such statements be further verified.

6. A list of contracts on which the Bidder is currently engaged.

7. Such additional information as will satisfy the Owner that the Bidder is adequately prepared, in technical experience and otherwise, to fulfill the Contract.

BID DEPOSIT

Each Proposal shall be accompanied by a bid deposit in the form described in the Advertisement for Bids, Specification Section 00030, as a guarantee on the part of the Bidder that they will, if called upon to do so, enter into contract in the attached form, to do the Work covered by such proposal and at the price stated in the proposal and to furnish acceptable surety for its faithful and entire fulfillment. Such certified check or Bidder's bond shall be made out to the Owner and shall be subject to the conditions specified in the Proposal.

The bid deposits of all except the three lowest Bidders will be returned within three days after the opening of bids. The bid deposits of the three lowest Bidders will be returned within 48 hours after the Contract is awarded to the successful Bidder and the signed agreement has been delivered and the required bonds have been finally approved by the Owner, or after rejection of all bids.

Surety companies providing and executing Bid Bonds shall appear on the United States Treasury Department's most current list (Circular 570) as holding certificates of authority as acceptable sureties on federal bonds. The penal sum of such bonds shall not exceed a company's underwriting limitation as stated in the current list. A surety company shall be licensed in the State in which it provides a bond and in the State where the Contract Work is to be performed.

Failure to provide a bid bond from a qualified company shall be a basis for rejection of a bid as non-responsive and non-responsible.

EXPLANATION TO BIDDERS BY ADDENDUMS

Neither the Owner nor the Engineer will give verbal answers to inquiries, regarding the meaning of the Drawings or Specifications, or give verbal instructions, previous to the award of the Contract. Any verbal statements regarding same by any persons, previous to the award, shall be unauthoritative.

Explanations desired by Bidders shall be requested of the Engineer in writing and, if explanations are necessary, a reply will be made in the form of an addendum, a copy of which will be forwarded to each bidder whose work is affected.

Addendums issued to Bidders prior to date of receipt of proposals shall become a part of the Specifications, and all proposals shall include the Work described in the Addendums.

No inquiry received after **5:00 p.m., local time on Wednesday April 8, 2026** will be given consideration.

Failure of the Engineer to send, or of the Bidder to receive, any such interpretations shall not relieve the Bidder from obligation under their bid as submitted.

RIGHT TO ACCEPT, TO REJECT, AND TO WAIVE DEFECTS

The Owner reserves the right to accept any Proposal, to reject any or all Proposals, and to waive any defects or irregularity in the Proposal if it appears advantageous to the Owner to do so.

Each Bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

TIME OF COMPLETION

The Owner and the individual citizens of the Municipality affected by this Project are vitally concerned with the prompt completion of the construction together with the cleanup and restoration of roads and lawns within the time allowed in the Proposal.

The Bidder shall use sufficient labor and equipment to complete and place in service all of the Work being constructed within this Contract within the time specified in the Proposal. The surface cleanup shall follow closely behind construction with earth spoil removed from lawns and roads and any trenches neatly finished by the end of each workday. Failure of the Bidder to comply with this type of professional job will result in the suspension of construction operations until the cleanup is effected.

If the Bidder shall be unavoidably delayed in beginning or fulfilling this Contract by reason of excessive storms or floods, or by Acts of Providence, or by strikes, or by court injunction, or by stopping of the Work by the Owner because of any emergency or public necessity, or by reason of alterations ordered by the Owner, the Bidder shall have no valid claim for damages on account of any cause or delay; but they shall in such case be entitled to such an extension of the above time limit, as the Engineer shall adjudge to be just and reasonable; provided, however, that formal claim for such extension shall be made in writing by the Bidder within a week after the date upon which such alleged cause or delay shall have occurred.

FAIR EMPLOYMENT PRACTICES

Section 4 of the Fair Employment Practices Act PA 1955, No. 251, provides:

Section 4. Every Contract to which the State or any of its political or civil subdivisions is a party shall contain a provision requiring the Bidder and their subcontractors not to discriminate against any employee or applicant for employment, to be employed in the performance of said contract, with respect to their hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment, because of their race, color, religion, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the Contract.

Section 4A of the Act provides:

Section 4A. Every contract which the State or any of its political or civil subdivisions is a party shall contain a provision requiring the Bidder and their subcontractors not to discriminate against any employee or applicant for employment to be employed in the performance of such contract with respect to their hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment because of their age or sex, except where based on a bona fide occupational qualification.

END OF SECTION

SECTION 00200

COORDINATION CLAUSE

DESCRIPTION

The Contractor must conduct operations so as to cooperate with and interfere as little as possible with activities of other contractors, utilities, or City of Marysville staff on or near the project area in conformance with the General Conditions of the Contract specifically, but not limited to, Articles 5, 16 & 17.

This clause summarizes the currently known conflicts, cooperation and coordination to aid in the successful construction of the project.

As an acknowledgement that this Coordination Clause has been reviewed and understood, a signature line has been provided at the end of this Section **which must be completed and submitted with the Bid** to be considered complete and responsive.

PUBLIC UTILITIES

Comply with Public Act 174 of 2013 (MISS DIG Underground Facility Damage and Protection Act) to reduce the incidences of damage to underground facilities

MEETINGS

A comprehensive list of meetings and agendas is provided in Section 01039.

Progress meetings will be held at maximum monthly intervals during active construction of the project at a time and location to be determined at the preconstruction meeting or virtually.

KNOWN CONSTRUCTION PROJECT WITHIN THE AREA

The following is a listing of known road construction projects within the local vicinity that may have an impact on this project. Please note that this listing may not be complete and the Contractor shall verify any other projects within the local vicinity that may impact this project.

- Pennsylvania Ave Water Main Replacement & Road Rehab Project (BMJ JN: 2504.16)

The Contractor shall coordinate their Work on this project with that by the Contractor on other projects, and as directed by the Engineer. No additional compensation will be allowed for costs incurred by the Contractor due to coordinating with or delays caused by other projects.

PERMITS

EGLE Part 41 – Rehabilitation Work require the City obtaining a Part 41 permit from the Department of Environment, Great Lakes, and Energy. This is a no fee permit.

MDOT ROW – Work within MDOT right of ways (ROW) require the City obtaining a permit from MDOT. This is a no fee permit.

CSX Railroad Permit – Work on pipe segments 5220 and 5474 require the City obtaining a permit from CSX railroad. Work on these segments shall not proceed until such a time that the permit is obtained. Should the permit not be obtained within the duration of the Contract, these pipe segments shall be descoped.

PROJECT SCHEDULE CONSIDERATIONS

The sequence of construction activities described herein are provided for the Contractor's consideration when developing a project schedule. The Contract includes a single Contract Completion Date, and the Contractor has the flexibility to perform the Work in any sequence that optimizes labor availability, material acquisition, and overall project efficiency except as noted as follows.

Rehabilitation work involving CIPP lining and/or chemical joint grouting is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.

Certain work locations such as within MDOT rights-of-way or areas identified in Section 02030 – Sequence of Construction and special Project Requirements require specific coordination and sequencing which must be considered for developing a project schedule.

SPECIAL CONDITIONS – ACCESS ROUTE TO PIPES 5386, 5387, 5388

Access to pipes 5386, 5387, and 5388 is limited due to their physical location. The City has established an access route to these pipes. On November 18, 2025, the City and the Engineer evaluated the proposed access route and provided the Contractor with detailed observations. The Contractor shall establish a viable access route to Pipes 5386, 5387, and 5388 and determine all materials and equipment required to achieve full access to perform the Work.

The Contractor shall coordinate with the City to determine the appropriate schedule and sequence for performing rehabilitation activities in this location. All costs associated with providing adequate access to Pipes 5386, 5387, and 5388 shall be included in the bid item "**Access Route to Pipes 5386, 5387, 5388."**

Refer to Specifications Section 02030 for additional information related to this project location.

SPECIAL CONDITIONS – RAILROAD CROSSING ACCESS FOR PIPES 5220, 5474, 5481

Pipes 5220, 5474, and 5481 convey beneath the railroad corridor routed through the City. The railroad is owned and operated by CSX Transportation. The Contractor shall establish a viable access route to Pipes 5220, 5474, and 5481 and determine all materials and equipment required to achieve full access to perform the Work.

This Work requires coordination with CSX Transportation. **A Railroad Inspector must be on site at all times when any Work is being performed within the CSX railroad right-of-way.** The Contractor shall schedule and arrange all activities accordingly to ensure compliance with CSX requirements.

Refer to Specifications Section 02030 for additional information related to this project location.

SPECIAL CONDITIONS – RESIDENTIAL REAR YARD ACCESS TO PIPES 5378, 6252, 5905, 5081

Pipes 5378, 6252, 5905, 5081 are located within the rear yards of residential properties and are not directly accessible from the roadway. Access to these locations will require coordination with the City and the affected Homeowner to obtain permission to enter their private yards. The Contractor shall identify and evaluate spatial constraints and confirm that adequate clearance exists for equipment and personnel to safely access the manholes at these locations prior to performing any rehabilitation Work. All disturbed areas within these rear yards shall be restored to their preconstruction condition. All labor, materials, and equipment associated with site restoration, including fence removal and replacement

if required, shall be incidental to the rehabilitation Work bid items. The Contractor shall notify the Homeowner in advance when rehabilitation Work is scheduled to occur.

Refer to Specifications Section 02030 for additional information related to this project location.

SPECIAL CONDITIONS – ADDITIONAL PRIORITY LOCATIONS PIPES 6308

Pipe 6308 is connected to upstream Manhole 2751 and ties directly into downstream Pipe 5520 through a tee connection. No intermediate manhole access is available at this location. This condition shall be taken into consideration when planning and performing the rehabilitation Work.

Refer to Specifications Section 02030 for additional information related to this project location.

HOURS OF OPERATION

The City of Marysville permits construction between the hours of 7:00 A.M. and 5:00 P.M., Monday through Friday unless otherwise indicated or specifically authorized by the City of Marysville. No work is permitted on Saturdays and Sundays. Should a situation arise which would require working beyond the hours permitted, The Contractor may request authorization from the Director of Public Services (DPS). Such requests shall be submitted through the Project Engineer, who will forward the request to the City for consideration.

M.I.O.S.H.A. STANDARDS

All work performed by the Contractor must conform to the current M.I.O.S.H.A. standards and requirements including confined space entry.

RESIDENT COMPLAINTS

The Contractor will be required to immediately address any resident complaints or concerns. Should the Contractor not be able to answer the resident, they must be directed to the Project Engineer.

INTERNAL SEWER INSPECTION

Upon completion of sewer work, the Contractor shall perform an internal inspection with PACP reporting of all new sewers in accordance with the requirements of Section 02704, except that all video records of the internal sewer inspection shall be supplied on hard drive, USB, or electronic share drives and be NASSCO PACP rating coded. Any debris or construction related materials found during this inspection shall be removed by the Contractor within 10 days of notification and re-inspected thereafter. Any remobilization or re-inspection required shall be completed at no cost to the City of Marysville.

ADDITIONAL BIDS - QUANTITY INCREASE/DECREASE

The majority of this Project is funded through the Environmental Protection Agency's (EPA) Congressionally Directed Spending (CDS) Grant. To fully utilize the available grant funds, the City of Marysville intends to rehabilitate as many sanitary sewer pipes as time and budget allow under this Contract. The estimated number of pipes to be rehabilitated is provided for bidding purposes and does not guarantee the total quantity of rehabilitation Work that will be performed. The City reserves the right to increase or decrease the quantity of pipes rehabilitated by up to twenty percent (20%) of the original Contract amount without penalty or adjustment to the Contract Unit Prices in order to ensure full expenditure of grant funds. No adjustment to the unit prices will be made for increases or decreases in quantities, regardless of the magnitude of the change.

TEMPORARY BYPASS PUMPING

The Contractor shall perform the work such that the flow in the existing sewers is not hindered at any time in a manner that would cause sewage levels in the local system to increase to levels that create the risk of basement back-ups or spilling of wastewater to the environment. In addition, all natural drainage within the project limits must be maintained at all times. It shall be left to the discretion of the Contractor as to the type and extent of work and materials necessary to accomplish this, including by-pass pumping. The Contractor will be liable for any and all damages resulting from failure to maintain the flow in existing sewers. This Work is considered incidental and shall be included in the overall project cost.

A detailed description of the bypass pumping and/or flow control plan that will be used during the project, with supporting calculations, shall be submitted via the permit schedule in MiEnviro for EGLE review and approval prior to implementation. Bypass pumping and/or flow control measures may not begin until EGLE has approved the plan, which may take up to **four (4) weeks**. An email notification shall be made to the Warren District Supervisor within one (1) week of the submission.

CONTRACTOR'S LIABILITY

The Contractor shall be solely responsible for any damages to buildings by sewage backups due to his operations. The Contractor shall indemnify and hold harmless the Owner and the Engineer in this regard.

SUBSURFACE CONDITIONS

The Contractor shall be solely responsible for making his own subsurface soils investigations and shall assume all risks and responsibility for his conclusions pertaining to the potential difficulties which may be encountered during the course of work. He shall complete the work, in whatever material and under whatever ground conditions he may encounter or create, without additional cost to the Owner.

WATER

If the Contractor elects to use City water for construction operations, all water shall be obtained exclusively from the Marysville Department of Public Works (DPW) facility. Hydrants shall not be used unless permitted by the City.

OPERATION OF CITY HYDRANTS

Hydrants shall not be used for the Project. If the Project requires the use of hydrants, the Contractor shall coordinate with the DPW. All existing hydrants are to be operated only by City water maintenance staff. At no time shall the Contractor operate these facilities. The Contractor shall contact the Project Engineer to schedule all hydrant-related activities. Meters will be installed on any hydrants authorized for use on the Project to track water usage.

MAINTAINING TRAFFIC

Access to all private drives shall be maintained at all times. The Contractor shall coordinate any required crossings with the Project Engineer and affected Property Owners. Certain sewer rehabilitation segments are located within easement areas and will require coordination with Property Owners and the City during construction. All materials used to maintain driveway access when needed shall be incidental to the Project unless otherwise specified in the Proposal.

Select sewer rehabilitation Work is located within roads under the jurisdiction of the Michigan Department of Transportation (MDOT), including Gratiot Boulevard and Busha Highway. Work performed within these roadways shall be conducted under permit from the respective road agency. Permit conditions may impose restrictions on allowable

Work hours. Advanced notice for permitted activities must be submitted to the Engineer at least seven (7) business days prior to the commencement of work. Submit a Completion Notice to the Engineer within five (5) calendar days of work being completed.

TREE AND SHRUBBERY PRESERVATION

Keep clear all debris, equipment, and materials outside the influence area of tree root systems, which is typically defined as the drip line. During construction, the Contractor shall not clean equipment, store materials, or dispose of waste products such as paints, oils, solvents, asphalt, concrete, mortar, or any other material harmful to plant life, within the drip line of any protected tree or group of trees.

No damaging attachments, wires (other than tree support wires), signs, or permits shall be fastened to any tree.

Tree Trimming: All bruised and scarred trunks and branches resulting from construction activities shall be repaired in accordance with standard arboriculture practices and performed by a qualified professional tree service company.

The Contractor will receive no additional compensation for the preservation of trees or for their removal and replacement where required. All work associated with tree preservation, as well as removal and replacement if applicable, shall be included in the unit price bid or provided at no additional cost to the owner.

The Contractor shall protect and/or replace all shrubbery damaged or destroyed by operations under this contract at no additional cost to the owner.

SITE RESTORATION

The Contractor shall restore all areas disturbed by this Project to their original condition or better. All work and materials required to perform site restoration shall be considered incidental to the project and will not be paid for separately. All site restoration work shall be subject to review and approval by the Owner.

Seeding shall be the primary method of turf restoration for all grass areas disturbed by the Work. Sodding shall be used only when specifically directed or approved by the Owner.

ACKNOWLEDGEMENT

The Contractor shall acknowledge that they have reviewed and agree to the coordination and special conditions described in this Section by signing below.

Acknowledged By:

Company:_____

Signature: _____

Printed Name:_____

Title:_____

Date:_____

END OF SECTION

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EXPERIENCE AND QUALIFICATIONS STATEMENT

Please complete the following form and provide all information requested. If more space is needed to complete a question, attach a separate sheet. Bidder may submit any additional information.

Company Name: _____

Company Address: _____

Company Phone: _____ Number of years operating under your present name: _____

Bonding Capacity: _____

Bonding Company: _____ Phone: _____

General nature of work performed by your company _____

_____

_____

Background and experience of the principal members of your organization including officers.

_____

_____

_____

_____

_____

_____

Add any information that may be pertinent to demonstrate your ability to complete this project.

_____

_____

Has your company defaulted on a contract?

_____

If yes, where and why?

_____

_____

CONTRACTOR MINIMUM QUALIFICATIONS

The following are minimum certification, staffing and experience requirements that the Contractor must possess to be considered a responsive and responsible Bidder. **Where asked to provide information below, submit the information with the bid;**

1. Contractor must have successfully completed 10 similar projects within the United States over the last **five (5) years** with full-length cured-in-place pipe (CIPP) projects. Successfully completed projects are those that were completed within the authorized schedule and budget.

2. Contractor must have installed within the United States a minimum of **1,000,000 liner feet** of the same CIPP products being represented by the Bidder.

3. The supervisor or project manager for this project must have a minimum of **five (5) years** of experience of CIPP projects. **Provide** the name and resume of the supervisor or project manager to be assigned to this project. This supervisor or project manager cannot be changed from the submitted personnel without authorization of the Owner.

4. Contractor must have staff with National Association of Sewer Service Companies' (NASSCO) Pipe Assessment Certification Program (PACP) certification that will be assigned to this project to provide PACP review. Such staff must have a minimum of **five (5) years** of experience reviewing CCTV data and coding pipe condition using PACP Version 7 and Version 8. Staff must be currently certified using PACP Version 8. **Provide** the name and resume of staff that will be reviewing the CCTV data and coding pipe condition using PACP Version 8 along with their certificate.

5. Contractor must provide references from at least **five (5)** separate contracts of similar work, specifically sanitary sewer investigations and rehabilitation including cleaning and televising of sewers using PACP coding, sewer lining using full-length cured-in-place-pipe, sectional cure-in-place-pipe, and grouting.

REFERENCE LIST

1. Project Name _____
   Contract Amount _____
   Year Constructed _____
   Owner _____
   Location (City, State) _____
   Owner's Contact Person _____
   Owner's Telephone No. _____

2. Project Name _____
   Contract Amount _____
   Year Constructed _____
   Owner _____
   Location (City, State) _____
   Owner's Contact Person _____
   Owner's Telephone No. _____

3. Project Name _____
Contract Amount _____
Year Constructed _____
Owner _____
Location (City, State) _____
Owner's Contact Person _____
Owner's Telephone No. _____

4. Project Name _____
Contract Amount _____
Year Constructed _____
Owner _____
Location (City, State) _____
Owner's Contact Person _____
Owner's Telephone No. _____

5. Project Name _____
Contract Amount _____
Year Constructed _____
Owner _____
Location (City, State) _____
Owner's Contact Person _____
Owner's Telephone No. _____

I hereby certify that the above answers are correct and true.

By: _____
Name

_____
Signature

_____
Title

Number(s) of additional sheets attached _____

END OF SECTION

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SECTION 00300

PROPOSAL
FOR
SEWER SYSTEM IMPROVEMENTS
CITY OF MARYSVILLE
ST. CLAIR COUNTY, MICHIGAN

City of Marysville
1255 Delaware Avenue
Marysville, MI 48040

Bids Due: **Thursday, April 16, 2026**
On or Before **1:00 p.m., Local Time**
HRC Job No. 20250698

To Prospective Bidders:

Name of Bidder: _____

Address: _____

Date: _____ Telephone: _____ Fax: _____

The above, as Bidder, hereby declares this Bid is made in good faith without fraud or collusion with any persons bidding, and that the Drawings, Specifications, and all other information referenced in the Instructions to Bidders (Section 00120) and in the Coordination Clause (00200) have been examined. Further, the Bidder is familiar with the location of the Work described in this Proposal and is fully informed as to the nature of the Work and the conditions relating to the performance of the Contract.

The Bidder acknowledges that no representations or warranties of any nature whatsoever have been received, or are relied upon from the City of Marysville, its agents or employees, as to any conditions to be encountered in accomplishing the Work and that the Bid is based solely upon the Bidder's own independent judgment.

The above, as Bidder, hereby certifies that the Drawings, Specifications, and other data provided by the Owner for bidding purposes have been examined. Further, the undersigned certifies that the proposed construction methods have been reviewed and found acceptable for the conditions which can be anticipated from the information provided for bidding.

The Bidder hereby affirms that the site of Work has been inspected and further declares that no charges in addition to the Individual Unit Prices shall be made on account of any job circumstances or field conditions which were present and/or ascertainable prior to the bidding. In addition, The Contractor, as such and as Bidder, shall make the determination as to existing soil conditions and shall also complete the Work under whatever conditions created by the Contractor/Bidder's sequence of construction, construction methods, or other conditions the Contractor/Bidder may create, at no additional cost to the Owner.

The above, as Bidder, confirms knowledge of the location of the proposed **Sewer System Improvements** Project and appurtenant construction in the City of Marysville, St. Clair County, Michigan, and the conditions under which it shall be constructed; and also declares to have carefully examined the Drawings, Specifications, and Contract Documents which the Bidder understands and accepts as sufficient for the purpose of constructing said **Sewer System Improvements** Project, and appurtenant work, and agrees to contract with the City of Marysville to furnish all labor,

materials, tools, equipment, facilities and supervision necessary to do all the Work specified and prescribed for the City of Marysville, in strict accordance with the Owner's General Conditions, and with the full intent of the Drawings and Specifications, prepared by Hubbell, Roth & Clark, Consulting Engineers, and will accept in full payment therefore the sum of:

BASE BID

ITEM NO.	ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL COST
1	Mobilization, Max 5%	1	LS		
2	Color Audio Video Survey	1	LS		
3	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 8-inch Sewer	6,532	Lft		
4	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 10-inch Sewer	12,868	Lft		
5	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 12-inch Sewer	2,559	Lft		
6	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 15-inch Sewer	5,745	Lft		
7	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 18-inch Sewer	3,997	Lft		
8	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 21-inch Sewer	1,992	Lft		
9	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 24-inch Sewer	1,101	Lft		
10	Pre-Rehabilitation, Clean & Televise with PACP Reporting, 48-inch Sewer	350	Lft		
11	Heavy Cleaning (As Needed)	63	Hrs		
12	Cut Protruding Tap/Lateral or Sewer	26	Ea		
13	Pipe Joint Grouting Setup	104	Ea		
14	Chemical Pipe Joint Grouting, (8")	32	Ea		
15	Chemical Pipe Joint Grouting, (10")	115	Ea		
16	Chemical Pipe Joint Grouting, (12")	11	Ea		
17	Chemical Pipe Joint Grouting, (15")	29	Ea		

18	Chemical Pipe Joint Grouting, (18")	28	Ea		
19	Chemical Pipe Joint Grouting, (21")	32	Ea		
20	Chemical Pipe Joint Grouting, (24")	8	Ea		
21	Chemical Pipe Joint Grouting, (48")	1	Ea		
22	Sewer, Cured-In-Place Pipe Lining, (8")	0	Lft		
23	Sewer, Cured-In-Place Pipe Lining, (10")	2,097	Lft		
24	Sewer, Cured-In-Place Pipe Lining, (12")	992	Lft		
25	Sewer, Cured-In-Place Pipe Lining, (15")	701	Lft		
26	Sewer, Cured-In-Place Pipe Lining, (18")	0	Lft		
27	Sewer, Cured-In-Place Pipe Lining, (21")	351	Lft		
28	Sewer, Cured-In-Place Pipe Lining, (24")	0	Lft		
29	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (8")	15	Ea		
30	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (10")	16	Ea		
31	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (12")	1	Ea		
32	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (15")	11	Ea		
33	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (18")	2	Ea		
34	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (21")	0	Ea		
35	Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot (24")	2	Ea		
36	Access Route to Pipes 5386, 5387, 5388	1	LS		
37	Residential Rear Yard Access to Pipes 5378, 6252, 5905, 5081	1	LS		
38	Railroad Crossing Access for Pipes 5220, 5474, 5481	1	LS		

39	Observation Crew Days		Days	$900.00	
40	Traffic Control, Major Roads	1	LS		
41	Traffic Control, Minor Roads	1	LS		
			TOTAL BID AMOUNT:		

OWNERS RIGHTS

The Owner reserves the right to add or delete quantities from the Contract and adjustments will be subject to the availability of the funds at the time of the bid letting. Deletion or addition of quantities shall not be grounds for the low qualified Bidder to adjust unit prices for the project that the Owner intends to execute as a Contract, nor shall the Contractor be entitled to compensation from unrealized profits resulting from the deletion of quantities.

The Owner, at its sole discretion, reserves the right to award to the Bidder who, in the sole determination of the Owner, will best serve the interest of the Owner. The Owner reserves the right to accept any Bid, to reject any or all Bids, to waive any and all informalities involving price, time, or changes in the Work, and to negotiate contract terms with the successful Bidder, and the right to disregard all nonconforming, nonresponsive, unbalanced or conditional Bids. However, it is the intention of the Owner to award the **project to the lowest responsive, responsible bidder with a recent history of successfully completed projects that were completed within the authorized schedule and budget**. Also, the Owner reserves the right to reject the Bid of any Bidder if the Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified, of doubtful financial ability, or fails to meet any other pertinent standard or criteria established by the Owner.

Each Bidder agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any Bid.

Each Proposal shall be accompanied by a Bid deposit in the form of a certified check, cashier's check or bid bond, executed by the Bidder and Surety Company, payable to the City of Marysville in the amount of five percent (5%) of the amount of the Proposal. See Instructions to Bidders – Bid Deposit for more information.

TAXES

The Bidder affirms that all applicable Federal, State and Local taxes of whatever character and description are included in all prices stated in this Form of Proposal.

ADDENDA

The Bidder acknowledges the following Addenda, covering revisions to the drawings or specifications and the cost, if any, of such revision has been included in the quoted Proposal:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

COMPLETE BID

The following items shall be submitted for the bid to be considered complete:

1. Completed proposal form on owner supplied sheets
2. Bid Bond
3. Signed acknowledgement of any addenda
4. Signed Coordination Clause (Section 00200)
5. Completed Experience and Qualifications form (Section 00250)
6. Signed Debarment, Suspension, and Other Responsibility Matters Certificate(Section 00460)
7. Signed "Iran Linked Business" Vendor Certification (Section 00704)
8. Signed Certification Regarding Lobbying (Section 00707)
9. Name and Qualifications of Contractor who will be performing the bypass pumping (Section 02141)
10. Styrene Odor Control Plan (Sections 02708 and 02709)
11. Preliminary design of CIPP liner (Sections 02708 and 02709)

FEES

The Bidder shall refer to the General Conditions for allowable Fees for additional work performed, upon Owner's written authorization, by Bidder's own forces and/or for additional work, upon Owner's written authorization, by Bidder's subcontractors.

TIME OF COMPLETION

If awarded the Contract for the **Sewer System Improvements Project**, Contractor agree to have all work substantially completed by **Tuesday, May 18, 2027**. Substantial Completion is defined that the Facility is ready to use for its intended purpose with all utility systems fully functional.

The Bidder hereby agrees to furnish the required Bonds, Insurance Certificates, and Policies within **fifteen (15)** days after acceptance of this Proposal.

Final Completion with all clean-up and punch-list items shall be complete by **Tuesday, June 1, 2027**.

The execution of all work and specific constraints as described in the Contract Drawings and specifications, with particular reference to Section 02030 Sequence of Construction and Special Project Requirements, shall be strictly adhered to.

LIQUIDATED DAMAGES

Time is of the essence for completion of this project in order to have the Project ready for the Owner. The Bidder guarantees that the Work will be completed within the time limit stated in this Proposal before or within the time as extended as provided elsewhere in the Specifications. Inasmuch as the damage and loss to the Owner which will result from the failure of the Bidder to complete the Work within the stipulated time, will be most difficult or impossible to accurately determine, it is mutually agreed that the damages to the Owner for such delay and failure on the part of the Bidder shall be liquidated in the amount of One Thousand Dollars ($1,000.00), for each and every calendar day by which the Bidder shall fail to complete the Work or any part of the Work within the Provisions described in this Proposal, and such liquidated damages shall not be considered as a penalty.

The Owner will deduct and retain out of any money due or to become due under the conditions described here the amount of the liquidated damages, and in case those amounts are less than the amount of actual liquidated damages, the Bidder shall pay the difference upon demand of the Owner.

Liquidated damages may be assessed should stipulated completion dates fail to be met. Specifically, liquidated damages will be assessed daily beginning **Tuesday, May 18, 2027** until such a time that Substantial Completion is achieved and further if all work is not completed by the Final Completion Date.

BIDS TO REMAIN FIRM

The price stated in this Proposal shall be guaranteed for a period of not less than **ninety (90)** days from the Bid due date and if authorized to proceed within that period, the Bidder agrees to complete the work covered by the Proposal at said price.

If this Proposal is accepted by the Owner and the undersigned shall fail to Contract as aforesaid and to furnish the required surety bonds within **fifteen (15)** days after being notified of the acceptance of their Bid, then the undersigned shall be considered to have abandoned the Contract, and the Certified Check, Cashier's Check or Bid Bond accompanying this Proposal shall be forfeited to the City of Marysville.

If the undersigned enters into the Contract in accordance with their Proposal, or if their Proposal is not accepted, then the accompanying Bid guarantee shall be returned to the undersigned.

Company Name: _____

Signature: _____ Title: _____

Address: _____

County: _____ State: _____

Telephone No.: _____ Fax No.: _____

Email Address: _____

LEGAL STATUS OF BIDDER

This Bid is submittal in the name of:

(Print)_____

The undersigned hereby designates below the business address to which all notices, directions or other communications may be served or mailed:

Street_____

City_____

State_____ Zip Code_____

The undersigned hereby declares the legal status checked below:

( ) INDIVIDUAL

( ) INDIVIDUAL DOING BUSINESS UNDER AN ASSUMED NAME

( ) CO-PARTNERSHIP
The Assumed Name of the Co-Partnership is registered in the County of _____, Michigan

( ) CORPORATION INCORPORATED UNDER THE LAWS OF THE STATE OF _____

_____. The Corporation is

( ) LICENSED TO DO BUSINESS IN MICHIGAN

( ) NOT NOW LICENSED TO DO BUSINESS IN MICHIGAN

The name, titles, and home addresses of all persons who are officers or partners in the organization are as follows:

A corporation duly organized and doing business under the laws of the State of _____

NAME AND TITLE	HOME ADDRESS
_____	_____
_____	_____
_____	_____

Signed and Sealed this_____ day of _____, 20__.

_____
By (Signature)

_____
Printed Name of Signer

_____
Title

BID BOND

We, the undersigned, _____

_____

As Principal, from this point forward called the Principal, and _____

_____

A corporation duly organized under the laws of the State of _____

As surety, from this point forward called the SURETY, are held and firmly bound unto:

The Owner: _____

in the sum of _____ Dollars ($_____),

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid for _____

_____

_____

NOW, THEREFORE, if the OWNER shall accept the Bid of the Principal and the Principal shall enter into a Contract with the OWNER in accordance with the terms of such Bid, and give such bond or bonds as may be specified in the CONTRACT DOCUMENTS with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution of such Contract, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the OWNER the difference not to exceed the penalty hereof between the amount specified in said Bid and such larger amount for which the OWNER may in good faith contract with another party to perform the work covered by said Bid, then the obligation of the Principal shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____, 20____

_____ _____

(Witness) (Principal) (Seal)

(Title)

_____

(Witness) (Surety)

_____

(Title)

END OF SECTION

United States
ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

OMB Control No. 2030-0020
Approval expires 06/30/2024

CG00E08006-0

EPA Project Control Number

WS01607523

CERTIFICATION REGARDING LOBBYING

CERTIFICATION FOR CONTRACTS, GRANTS, **LOANS AND COOPERATIVE AGREEMENTS**

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including sub-contracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

_____
Typed Name & Title of Authorized Representative

_____
Signature and Date of Authorized Representative

SECTION 02030

SEQUENCE OF CONSTRUCTION AND SPECIAL PROJECT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes
   1. Price and Payment Procedures
   2. Administrative Requirements
   3. Special Access Requirements
   4. Special Project Requirements
   5. Attachments

B. Abbreviations and Acronyms Definitions
   1. BABA – Build America, Buy America Act
   2. CIPP – Cured-in-Place Pipe
   3. CSX – CSX Transportation
   4. DBA – Davis-Bacon Act
   5. DPW – Department of Public Works
   6. EPA – United States Environmental Protection Agency
   7. MDOT – Michigan Department of Transportation.
   8. PACP – Pipeline Assessment Certification Program

C. Project Description
   1. The intent of this project is to complete sewer rehabilitation Work on the existing City of Marysville sanitary sewer system. This project will address many of the higher priority sewer segments in need of rehabilitation.

D. The type of work to be performed involves:
   1. Sectional and Full Length Cured-in-Place Pipe (CIPP) Lining
      a. Ranging from 8-inch to 24-inch.
   2. Chemical Pipe Joint Grouting
      a. Ranging from 8-inch to 48-inch.
   3. Heavy Cleaning
      a. As needed work. Heavy cleaning differs from initial cleaning and requires machinery to remove large debris. Related costs to heavy cleaning are listed as a separate unit price per hour.
      b. Refer to Section 00300 – Proposal and Section 02751 – Cleaning Sewer Pipelines for details on these unit price bids.
   4. Temporary bypass pumping is expected to be routine for this type of work, and related costs are to be included in the unit prices bid for sewer rehabilitation.
   5. Traffic control is expected to be routine for this Work in most cases, with the exception of two (2) main roads Gratiot Boulevard and Busha Highway, which are owned and maintained by MDOT. Related costs for traffic control are separated into major and minor road control. Refer to Section 02550 – Maintaining Traffic for details on unit price bids and procedures.

1.2 PRICE AND PAYMENT PROCEDURES

A. All Pay Item descriptions are provided in the respective Sections of the Specifications for the various types of Work and/or in Section 01220. Any questions or apparent discrepancies shall be immediately brought to the Engineer's attention for clarification.

B. Only the items identified on the Proposal form (Section 00300) and in the Bid Item Description Specification (Section 01220) shall be eligible for payment. Contractors are expected to have developed an understanding of the Work required prior to submitting their bid. The Contractor shall consider all other items required to complete the Work identified in these Contract Documents as incidental. This includes but is not limited to:
   1. Bypass pumping
   2. Site Clearing
   3. Sign, Shed, Fence, etc., Removal, Salvage, and Replacement
   4. Post-Rehabilitation Televising with PACP Reporting
   5. ALL restoration items
      a. Topsoil/Seeding
      b. Replacement/Reinstallation of any fences or existing structures.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Davis-Bacon Act (DBA) Wage Requirements
   1. This Contract requires compliance with the Davis-Bacon and Related Acts, including prevailing wages prescribed by a Labor Wage decision by the U.S. Department of Labor. This Contract requires the Contractor to post all required Davis-Bacon posters, produce certified payrolls, and all other requirements Davis-Bacon and Related Acts.
   2. Refer to Section 00851 for all requirements and standards with which the Contractor must comply with related to the DBA.

B. Build America Buy America (BABA)
   1. The Build America, Buy America Act (BABA), a part of the Infrastructure Investment and Jobs Act (Public Law 117-58), requires that recipients of U.S. Environmental Protection Agency (EPA) Congressionally Directed Spending (CDS) Grant use products that are produced in the United States for infrastructure projects, including construction, alteration, maintenance, or repair.
   2. Refer to Section 00853 for all requirements and standards with which the Contractor must comply with related to the BABA.

C. Coordination
   1. Coordinate all Work activities closely with the City of Marysville DPW and the Engineer.

D. Sequencing
   1. The sequence of construction activities described herein are provided for the Contractor's consideration when developing the project schedule. The Contract includes a single Contract Completion Date, and the Contractor has the flexibility to perform the Work in any sequence that optimizes labor availability, material acquisition, and overall project efficiency except as noted as follows.
   2. Collection System Rehabilitation segments may be completed at any time, preferably in logical geographic groupings to minimize traffic impacts and inconvenience to the public.

Certain segments are located near public and private schools and places of worship, and the Contractor shall coordinate with appropriate officials to minimize impacts to these facilities.

E. Scheduling

1. The Contractor shall schedule and arrange Work so that the existing sewer system and its customers will remain in service, without interruption, until all Work has been fully constructed, tested, and approved.
2. Normal working hours for the City of Marysville is 7:00 A.M. to 5:00 P.M., Monday through Friday. Work on Saturdays, Sundays, or outside normal working hours may be permitted in certain areas with prior approval from the City. Requests for work time variances should be made at least 48 hours prior to the proposed start time.
3. In general, Work on new facilities may proceed according to a schedule developed by the Contractor to meet the Contract Completion Date identified in the Proposal. All scheduling, however, is subject to approval by the Owner.
4. Rehabilitation work involving CIPP lining and/or chemical joint grouting is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.
5. The Contractor is fully responsible for construction of the project in accordance with the scheduling requirements described herein and any additional scheduling necessary to meet the Contract Completion Date. All Work shall be completed for the lump sum amounts and unit prices, including units measured on an each, hour, day or other basis, as listed in the Contractor's Proposal (Section 00300). No additional compensation will be provided for delays required to avoid interruptions of service, whether or not such delays are explicitly described in this section.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 SPECIAL ACCESS REQUIREMENTS

A. Access Route to Pipes 5386, 5387, and 5388

1. Access to pipes 5386, 5387, and 5388 is restricted due to the physical location of the pipes. The City has established an approved route for these pipes. On November 18, 2025, the City and the Engineer evaluated the proposed access route. Refer to the location maps in Attachment 3.3.A within this Section for the detailed observations.
2. The City has stated that 20-foot prescribed easements exist along the length of the sewer, consisting of 10 feet on each side of the sewer centerline. Portions of the established access route fall within these easements. Portions of the access route that fall outside the prescribed easements are located on private property and will require coordination with the City to provide advance notification to residents regarding access to Pipes 5386, 5387, and 5388. The City has indicated that this existing access road may be utilized by the Contractor to complete this Work.

3. The Contractor shall review the established access route to Pipes 5386, 5387, and 5388, as identified by the City and the Engineer, and determine the type and quantity of gravel, temporary mats, or other materials they deem necessary to support their equipment and achieve proper access to perform the Work.
4. All costs associated with the labor, materials, and equipment to provide access at this location shall be included in the Bid item **"Access Route to Pipes 5386, 5387, 5388."** Items incidental to this Bid item include but are not limited to restoration, repairing ruts, and other grading required.
5. It is recommended that the Contractor and the City jointly review and visit the site for pipes 5386, 5387, and 5388 immediately following the Prebid Meeting to determine the required scope and associated costs for providing a suitable access route to allow for the cleaning, televising and rehabilitation of the sewers as required. The Contractor shall coordinate with the City to secure access and shall notify the City at least 24-hours in advance of any Work, including but not limited to, access preparations, sewer cleaning, sewer televising, and sewer rehabilitation at this location.
6. Work on Pipes 5386, 5387, and 5388 shall be scheduled during periods when ground conditions are stable. Due to the time required to prepare the access route and the variability of weather conditions, the Contractor shall plan to perform this Work **only during frozen ground conditions** unless otherwise approved by the Owner. The Contractor shall plan and arrange Work activities such that ground conditions do not impede access and do not interfere with Work in this area.

B. Railroad Crossing Access for Pipes 5220, 5474, and 5481

1. Pipes 5220, 5474, and 5481 are located under a CSX Transportation railroad. Refer to Appendix A for the general location of these Work areas and to the location maps in Attachment 3.3.B within this Section for detailed mapping of the Work area.
2. Work on pipe segments 5220, 5474, and 5481 requires the City to obtain a permit from CSX Transportation. Work on these segments shall not proceed until such a time that the permit is obtained. Should the permit not be obtained within the duration of the Contract, these pipe segments shall be descoped.
3. The Contractor shall review access to the pipes and determine the required materials and labor required to provide necessary access to perform the Work. This includes coordinating with CSX and ensuring that a railroad inspector is present on site during the Work.
4. The Contractor shall coordinate with CSX personnel to ensure CSX staff are available during rehabilitation Work occurring within the CSX railroad right of way. The Contractor shall provide the City and Engineer at least 30 business days' notice prior to working on pipes 5220, 5474, and 5481, as the City must provide 30 business days' notice to CSX to allow time for assignment of railroad inspector. Such notification to CSX will only be accepted from the Owner of the undercrossing, or the Owner's duly authorized agent; CSX will not accept notifications submitted by the Contractor. If a Railroad Inspector cannot be made available, adjustments to the Work schedule may be required.
5. Work on Pipes 5220, 5474, and 5481 shall be sequenced to optimize personnel resources and to reduce the frequency of required coordination with CSX.
6. All costs associated with the labor, materials, and equipment to provide access at this location shall be included in the Bid item **"Railroad Crossing Access for Pipes 5220, 5474, 5481."**
7. Rehabilitation materials and procedures shall be designed to comply with standard loading requirements applicable to sewer lining installations under railroads. CIPP installations shall be designed in accordance with ASTM F 1216, Appendix X1.

8. CIPP designs will not be accepted when the wall thickness of the CIPP liner is greater than two (2) inches.
9. Railroad live loads shall be designed using Cooper E-80 Loading. Railroad load requirements are also provided in Section 3.2.3 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).
10. Refer to Section 2.4, 3.2, and 3.16 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in Attachment E within this Specifications Section.
11. Refer to the Full-Length CIPP Lining (Specifications Section 02708) and Sectional CIPP Lining (Specifications Section 02709) for details on lining procedures and loading requirements and standards.

C. Residential Rear Yard Access to Pipes 5378, 6252, 5905, 5081

1. The Contractor shall coordinate with the City and affected Homeowners for all rehabilitation activities located within residential rear yards. The Contractor shall notify the City and the Homeowner no less than 24-hours in advance of any scheduled Work at these locations by door hangar or another form of writing. Include a 24-hour contact telephone number for questions regarding the Work.
2. Each work site shall be restored to its pre-construction condition upon completion of the Work. Fences and/or existing structures removed to perform the Work shall be reinstalled or replaced upon completion. All labor, materials, and equipment required for site restoration shall be considered incidental to the Work Bid item **"Residential Rear Yard Access to Pipes 5378, 6252, 5905, 5081"**
3. **Pipes 5378, 6252, and 5905** are located within the rear yards of residential properties along Georgia Avenue and Carolina Avenue between 13th Street and 15th Street. Manholes 1016 and 1341 are not directly accessible from the roadway and will require coordination with the City and the respective Homeowners to obtain access to their yard.
    a. The Work associated with pipes 5378, 6252, and 5905 shall be performed with consideration of the spatial constraints impacting access to manholes 1016 and 1341.
    b. Refer to Appendix A for the general location of these work areas, and to the location maps in Attachment 3.3.C within this Section for detailed mapping of the work area.
4. **Pipe 5081** is located within the rear yard in the open field between 202 and 204 Michigan Avenue. Access from the roadway to Pipe 5081 will require coordination with the City and the Homeowners to obtain access to their yards.
    a. Refer to Appendix A for the general location of this Work area, and to the location map in Attachment 3.3.C within this Section for detailed mapping of the Work area.

D. Additional Priority Location Pipe 6308

1. Pipe 6308 is connected to upstream manhole 2751 and transitions downstream via a direct tee connection to Pipe 5520, with no intermediate manhole access. This condition shall be considered when preparing and planning the Work.
    a. The Contractor shall coordinate with the City regarding to any additional Work that may be required to successfully rehabilitate Pipe 6308
    b. Refer to Appendix A for the general location of this Work area, and to the location map in Attachment 3.3.D within this Section for a detailed mapping of the Work area.

3.2 SPECIAL PROJECT REQUIREMENTS

A. Water

1. If the Contractor elects to use City water for construction operations, all water shall be obtained exclusively from the Marysville Department of Public Works (DPW) facility. No other hydrants or connections shall be used unless authorized by the City. The Contractor shall coordinate all water usage with the DPW, and no City water may be used without prior authorization. The Contractor shall record the time, date, and volume of water obtained for each fill up and shall provide this information to the City/Engineer upon request. When all instructions herein are followed, the City will provide the water at no charge. The City reserves the right to charge the Contractor for water usage if it determines that the Contractor has used City water in a manner not coordinated or approved by the City.

B. Maintaining Traffic

1. Certain sewer rehabilitation Work will be performed within road right-of-ways. Other sewer segments are located within easement areas and will require coordination with the property owners and the City of Marysville during construction.
2. Select sewer rehabilitation Work is located within roads under the jurisdiction of the Michigan Department of Transportation (MDOT), including Gratiot Boulevard and Busha Highway. Work performed within these roadways shall be conducted under permit from the respective road agency. Permit conditions may impose restrictions on allowable work hours.
3. Coordinate with MDOT for all permitted Work within road rights-of-way under their jurisdiction. Provide all required notifications to MDOT prior to performing any activities that may interfere with traffic operations as required by the MDOT permit. Advanced notice for permitted activities must be submitted to the Engineer at least seven (7) business days prior to the commencement of work.
4. Submit a Completion Notice to the Engineer within five (5) calendar days of work being completed.
5. Refer to Section 02550 – Maintaining Traffic for the unit price bid items and standard procedures associated with traffic control.
6. Refer to Section 02990 – Permits for compliance requirements listed under the issued permit.

C. Temporary Bypass Pumping / Flow Control

1. The Contractor shall perform the work such that the flow in the existing sewers is not hindered at any time in a manner that could cause sewage levels in the local system to increase to levels that create the risk of basement back-ups, or wastewater spills to the environment.
2. Temporary bypass pumping shall be utilized to maintain uninterrupted sewer service during the Work.
3. The Contractor shall not overflow, bypass, pump, or otherwise discharge sanitary sewage onto any land, street, storm drain, or water course under any circumstances.
4. Refer to Section 02141 – Temporary Bypass Pumping for standard procedures associated with bypass pumping and flow control.

D. Dust Control

1. The site, haul roads, detour roads, and all public and private roads, driveways and parking lots used by the Contractor shall be maintained in a dust free condition for the duration of the Contract. Dust control shall be achieved through the application of dust control materials and methods as approved and as directed by the Owner. Such materials shall be applied as often as necessary to effectively control dust.
2. Should the Contractor be negligent of his duties in providing dust control, the Owner may, with or without notice, cause the same to be done and deduct the cost of such work from any monies due or to become due the Contractor under this Contract, but the performance of such Work by the Owner, or at his insistence, shall serve in no way to release the Contractor from his liability for dust control.
3. Dust Palliative may be any of the following:
    a. Type 1 calcium chloride applied at the rate of 6 lbs. per ton of aggregate.
    b. Water, as required.
    c. Other methods as approved by the Owner.

E. Restoration/Reinstallation

1. Due to the nature of this sewer rehabilitation project, minimal disturbance to areas surrounding sewer manholes is anticipated. The Contractor shall take all reasonable precautions to limit disturbance to existing surfaces and site features. All disturbed areas shall be restored to match pre-existing conditions.
2. The Contractor shall comply with the general landscaping requirements for site restoration Documents.

3.3 ATTACHMENTS

A. Location Maps for **Access Route to Pipes 5386, 5387, 5388**

B. Location Maps for **Railroad Crossing Access for Pipes 5220, 5474, and 5481**

C. Location Maps for **Residential Rear Yard Access to Pipes 5378, 6252, 5905, 5081**

D. Location Maps for **Additional Priority Location Pipes 6308**

E. CSX Design and Construction Standard Specifications for Pipeline Occupancies

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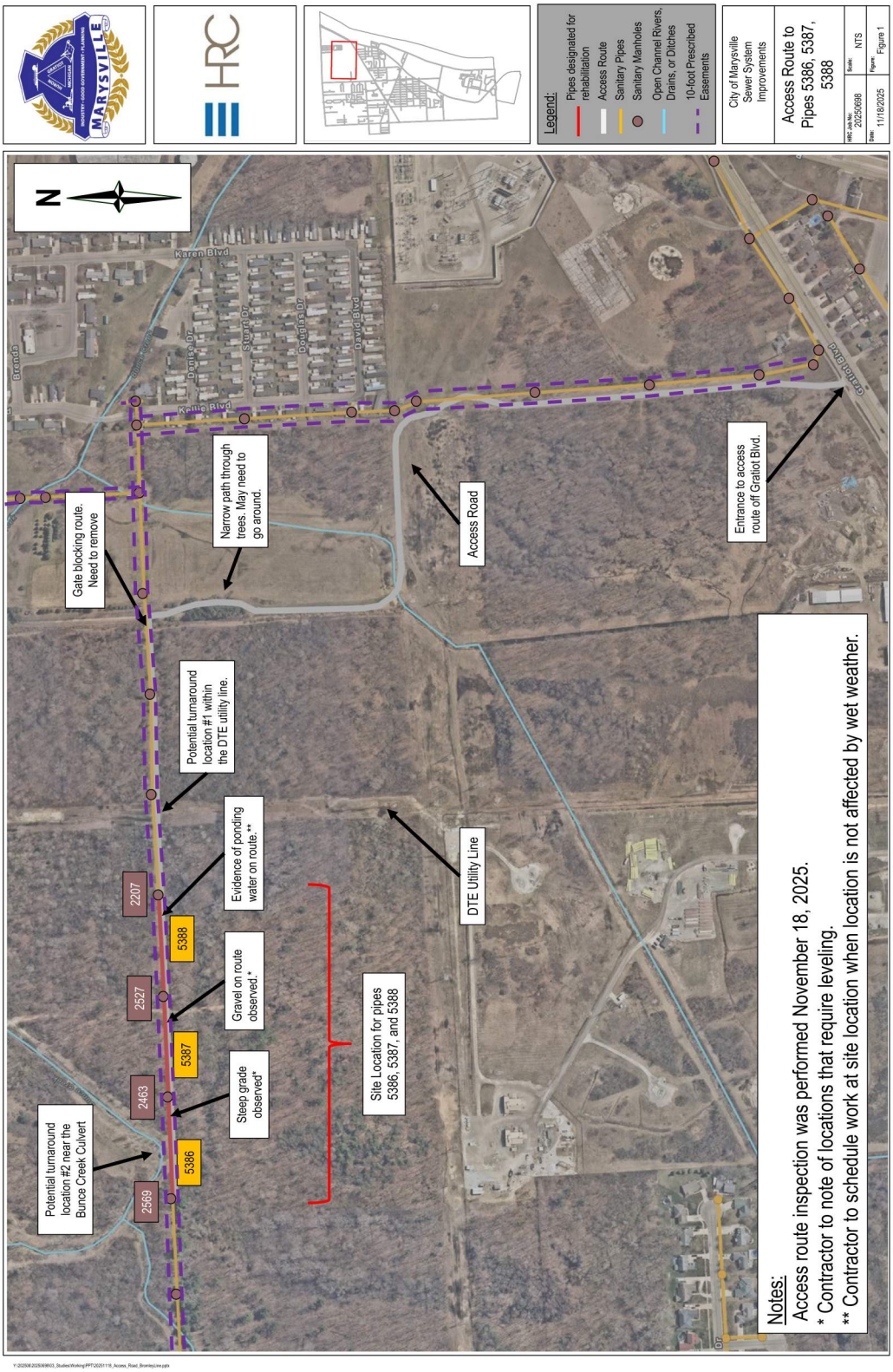
Attachment 3.3.A. – Access Route to Pipes 5386, 5387, 5388 (Figure 1)



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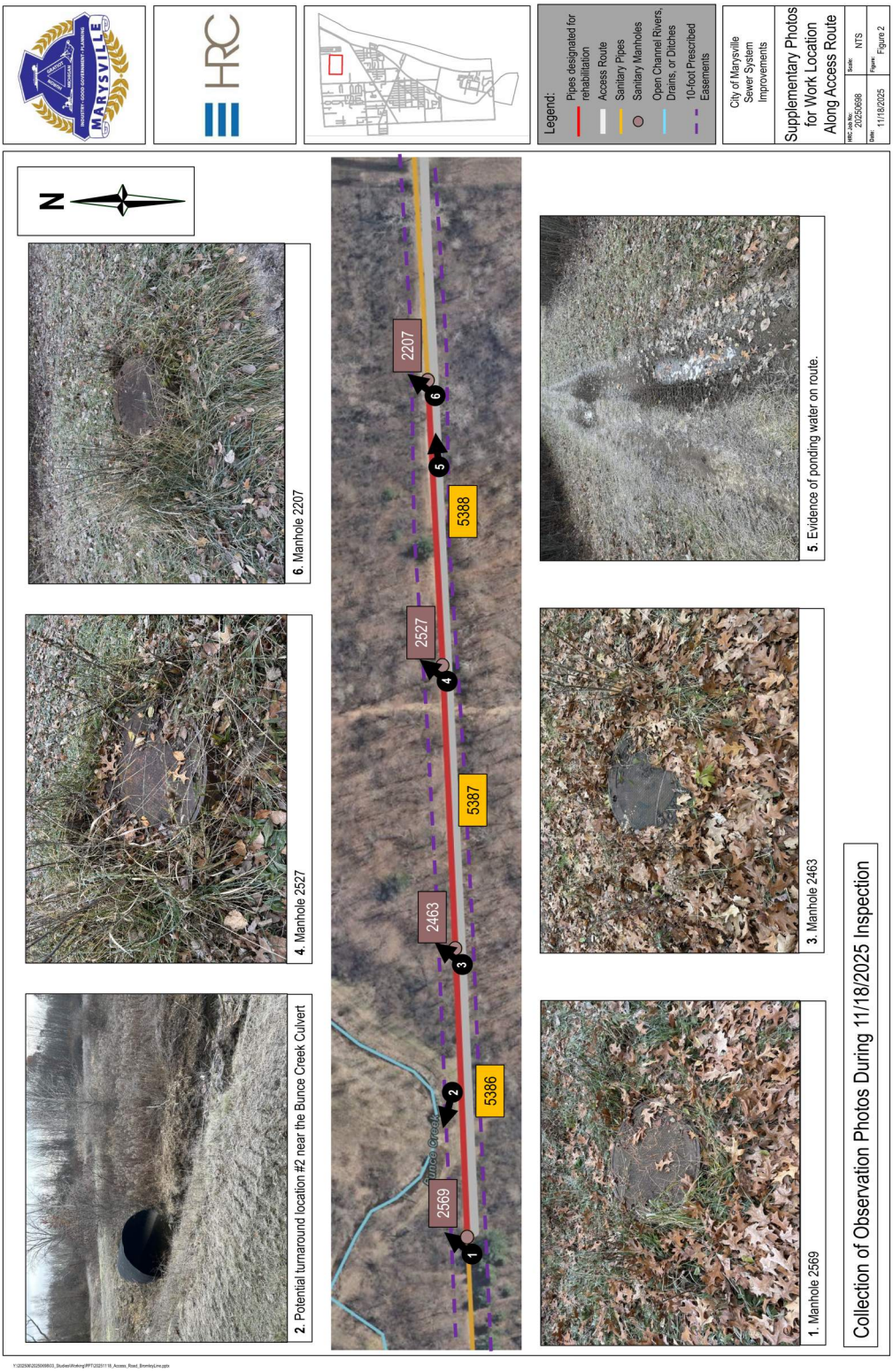
Attachment 3.3.A. – Access Route to Pipes 5386, 5387, 5388 (Figure 2)



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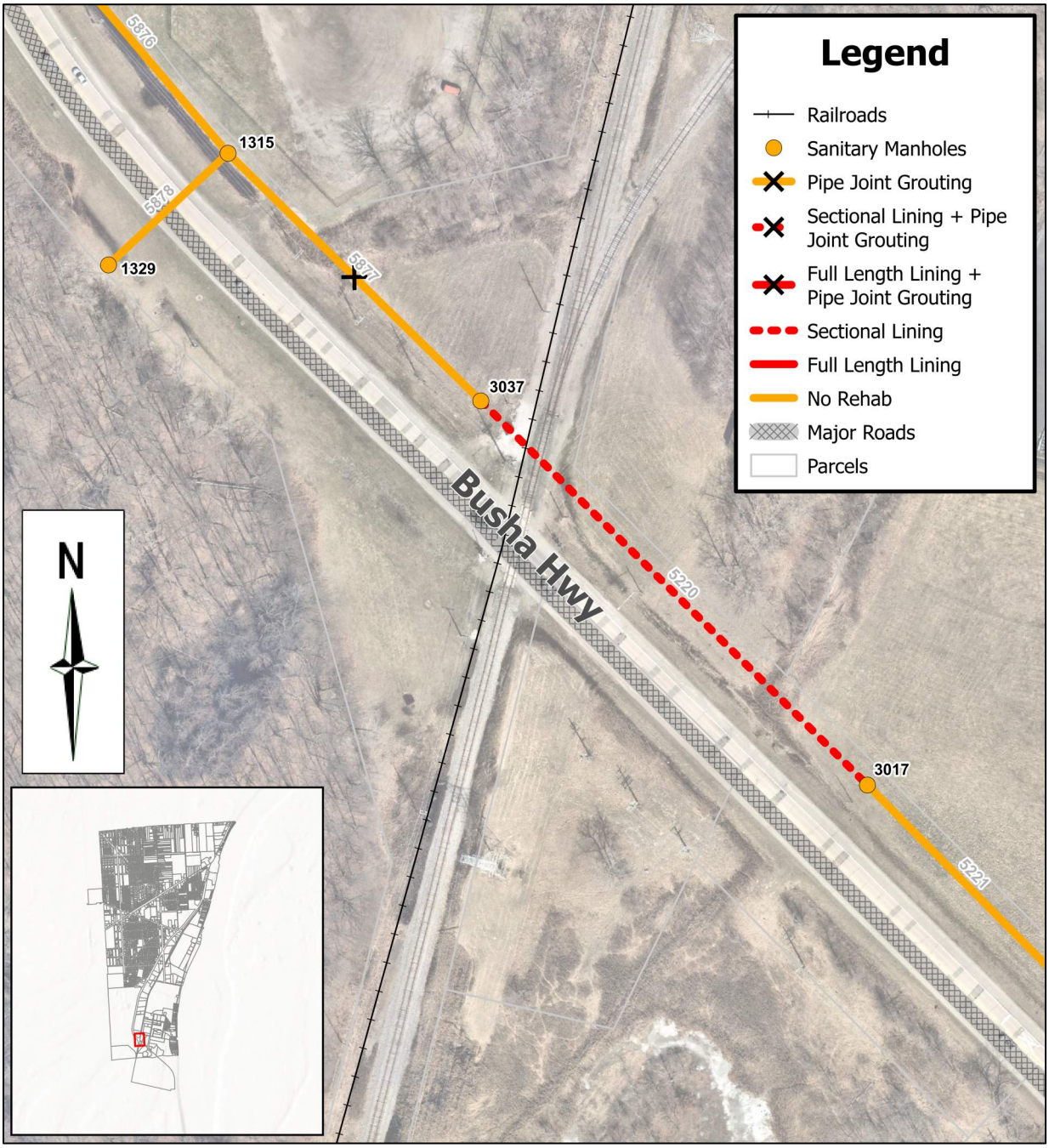
Attachment 3.3.B. – Pipe 5220 Location Map



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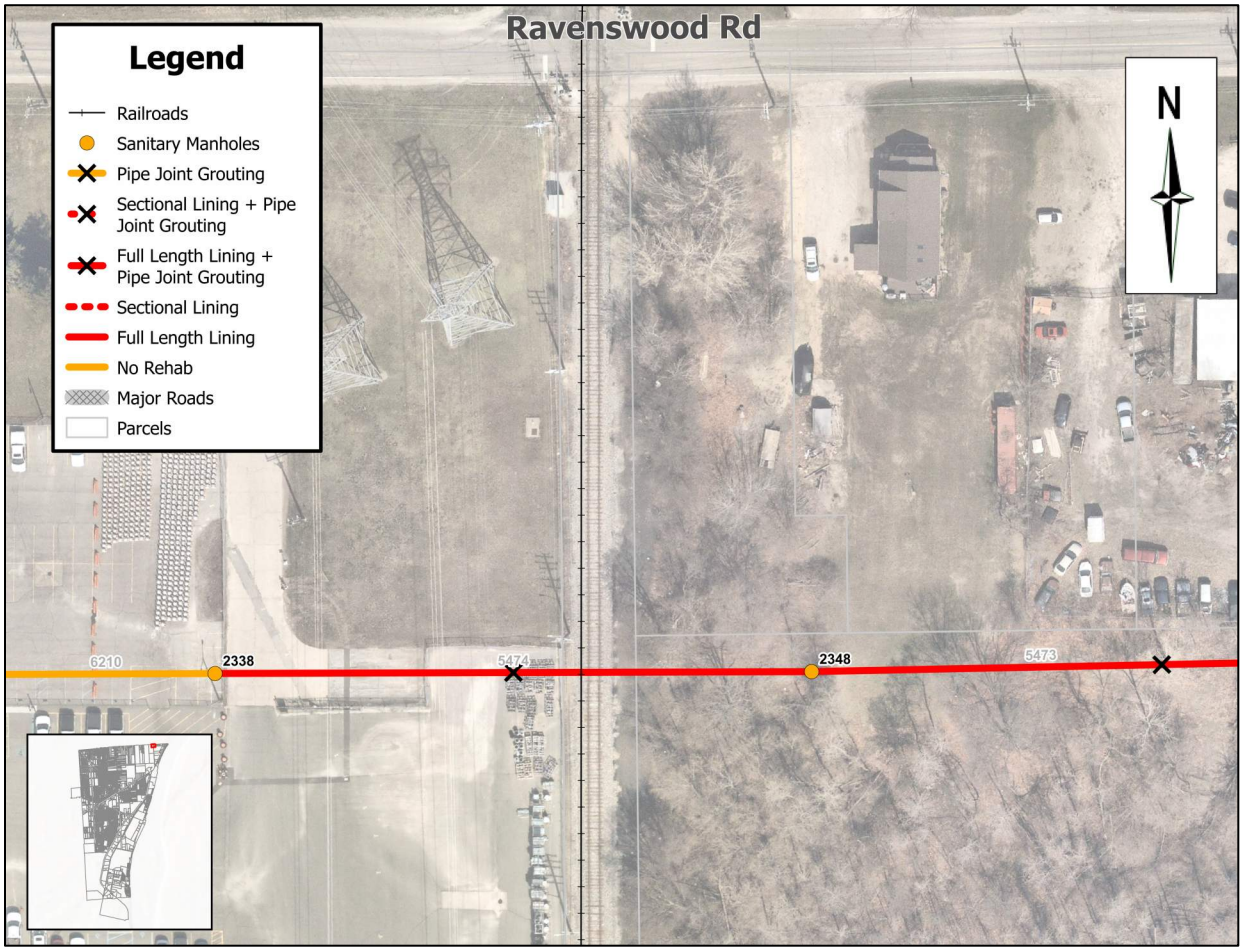
Attachment 3.3.B. – Pipe 5474 Location Map



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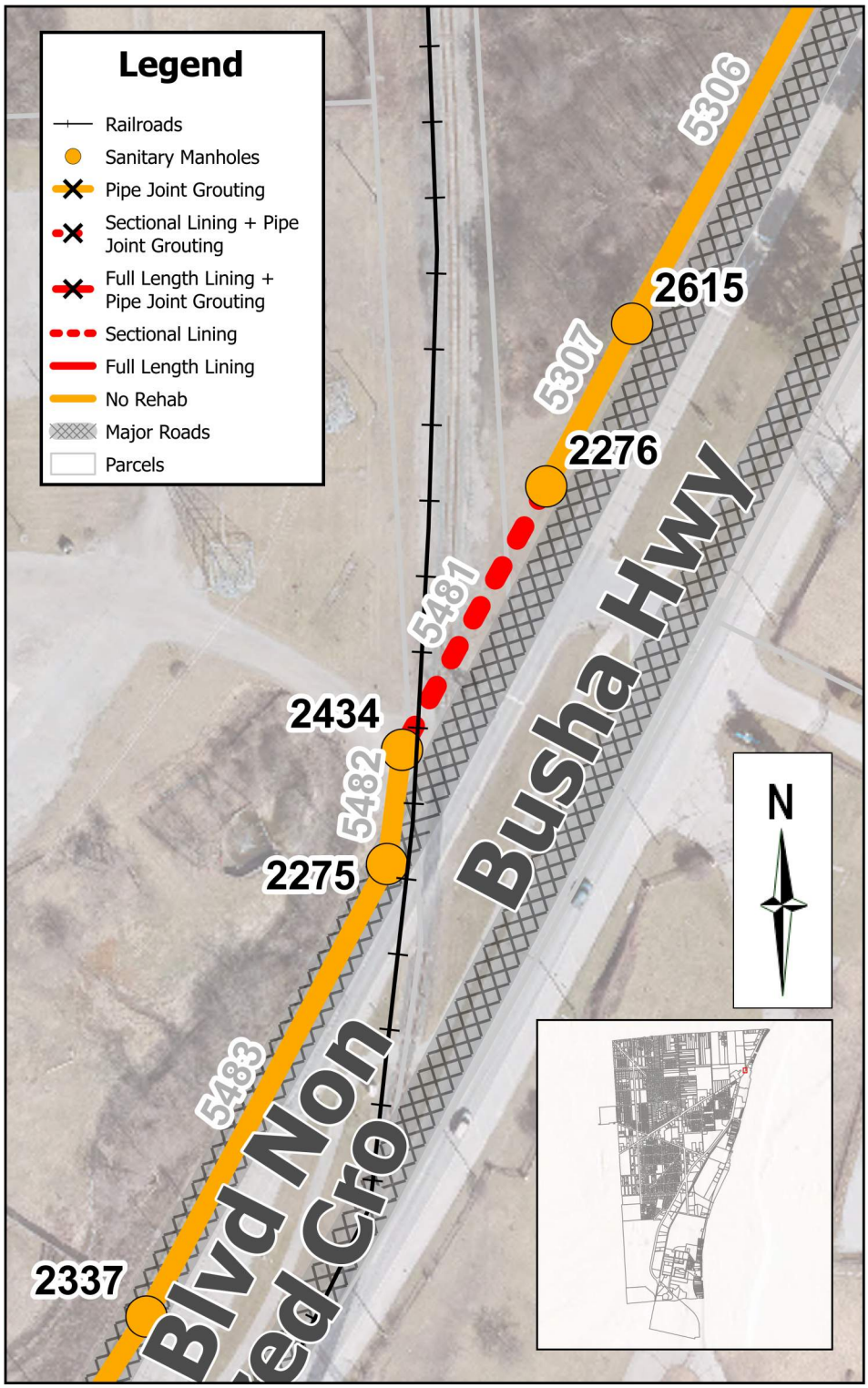
Attachment 3.3.B. – Pipe 5481 Location Map



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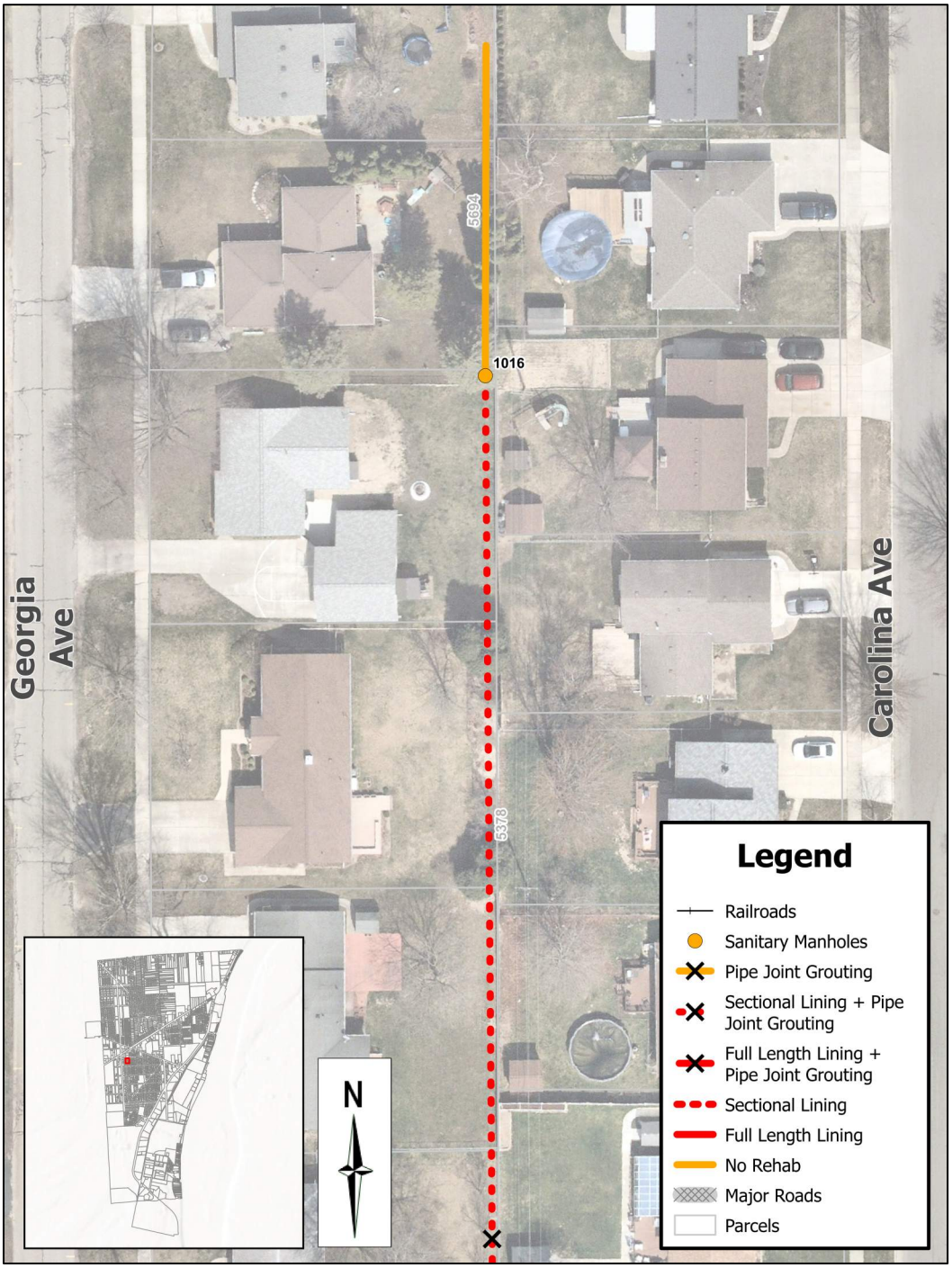
Attachment 3.3.C. – Rear Yard Manhole 1016 Location Map



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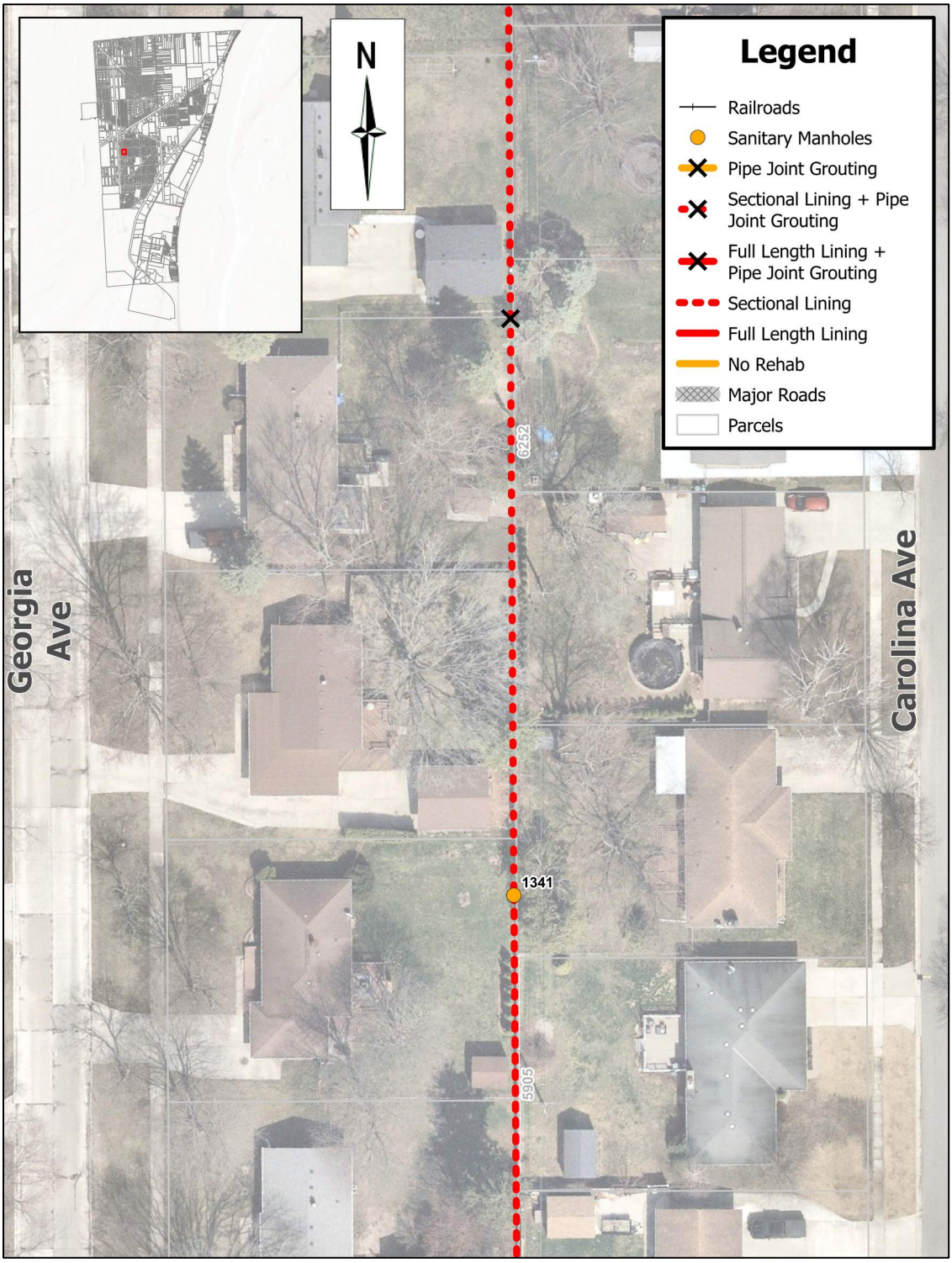
Attachment 3.3.C. – Rear Yard Manhole 1341 Location Map



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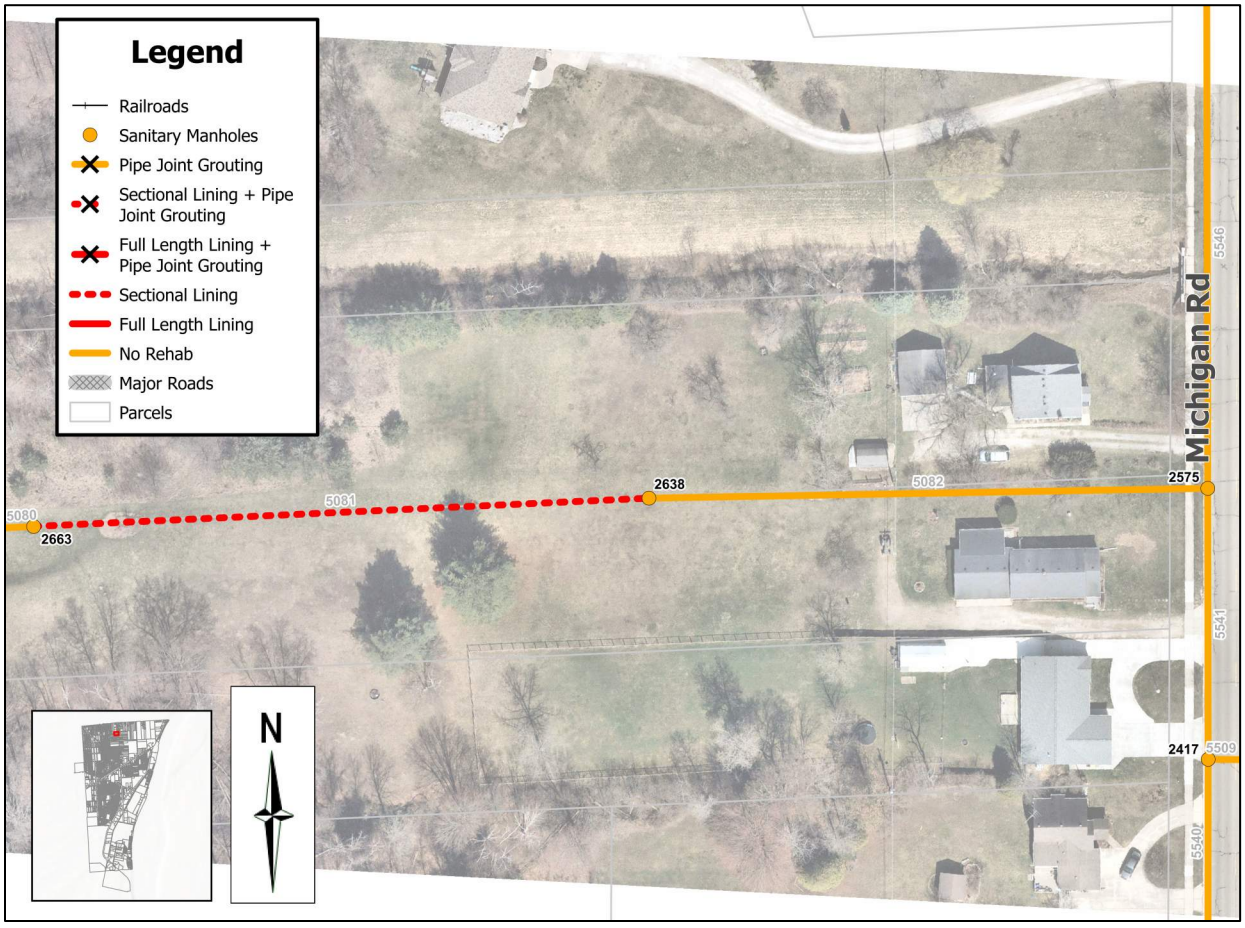
Attachment 3.3.C. – Rear Yard Pipe 5081 Location Map



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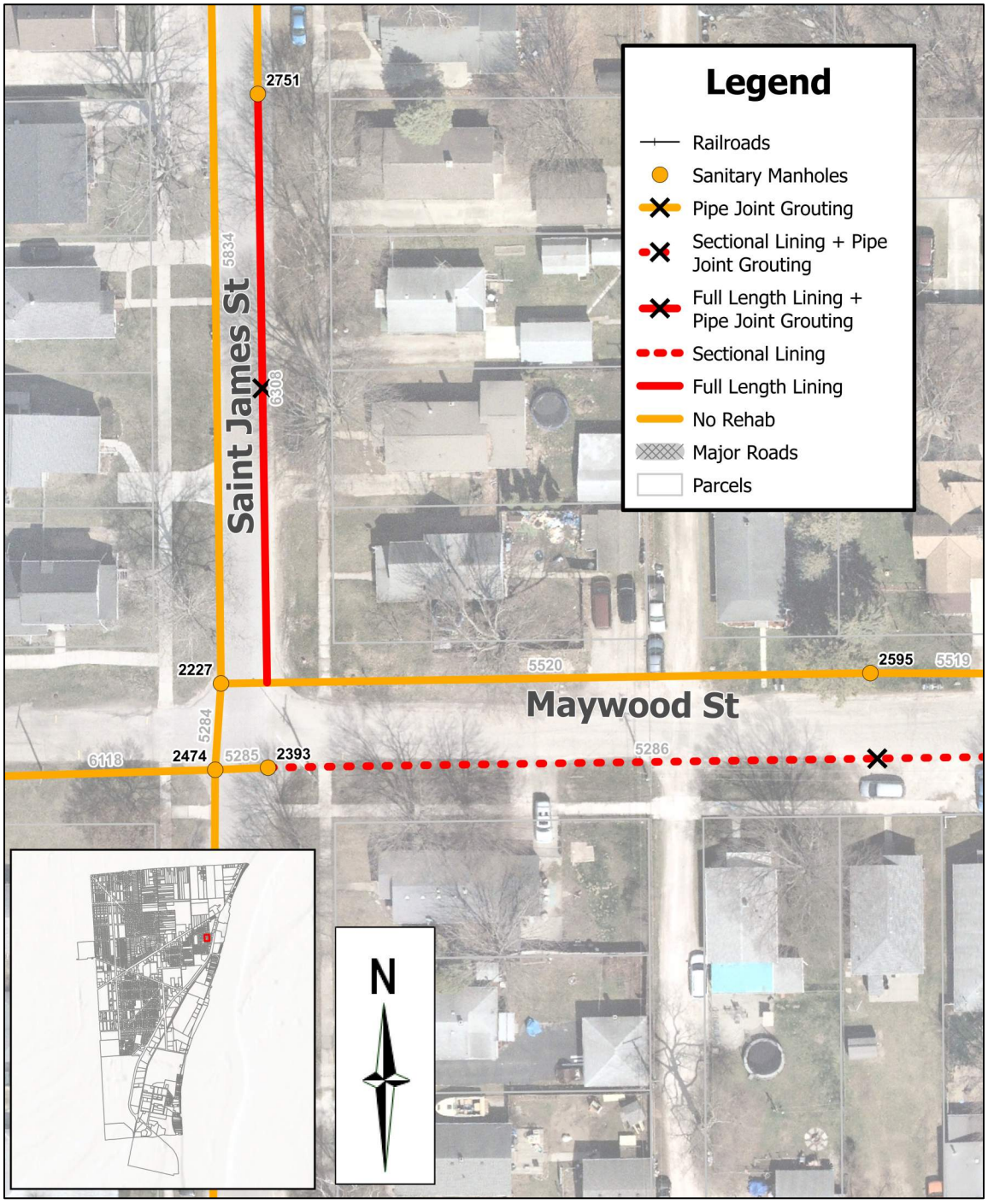
Attachment 3.3.D. – Pipe 6308 Location Map



END OF SECTION

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Attachment 3.3.E.

DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS

Pipeline Occupancies

OFFICE OF:
VICE PRESIDENT - ENGINEERING
JACKSONVILLE, FLORIDA
ISSUED: September 15, 2003
REVISED: June 5, 2018

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Part 1 – Introduction

Part 2 – General Requirements

Part 3 – Design Requirements

Part 3 – Design Requirements (Continued) PAGE

Part 4 – Construction Requirements

Part 5 – Publication Standards Sources

Tables

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PART 1 – INTRODUCTION

1.1 Scope

a) This specification shall apply to the design and construction of pipelines carrying flammable or non-flammable substances and casings containing wires, cables, and carrier pipes across and along CSXT property and facilities. This specification shall also apply to tracks owned by others (sidings, industry tracks, etc.) over which CSXT operates its equipment.

b) It is to be clearly understood that CSXT owns its right-of-way for the primary purpose of operating a railroad. All occupancies shall therefore be designed and constructed so that rail operations and facilities are not interfered with, interrupted, or endangered. In addition, the proposed facility shall be located to minimize encumbrance to the right-of- way so that the railroad will have unrestricted use of its property for current and future operations.

1.2 Definitions

CSXT	CSX Transportation, Inc.
CS	Corridor Services
Owner (Applicant)	Individual, Corporation, or Municipality desiring occupancy of CSXT property
Professional Engineer	Engineer licensed in the state where the facilities are to be constructed
Carrier Pipe	Pipe used to transport the commodity
Casing Pipe	Pipe through which the carrier pipe is installed under main tracks
Sidings or Industry Tracks	Tracks located off of CSXT's right-of-way, serving an industry

1.3 Application for Occupancy

a) Owner (Applicant) desiring occupancy of CSXT property by pipeline occupations must satisfy the following: receive approval by CSXT of all engineering and construction details, execute an appropriate CSXT occupational agreement, and remit payment of any required fees and/or rentals specified therein.

b) Occupancy applications shall be completed in full with all of the required information requested in order for the application to be processed. Review the entire application package, as well as the engineering specifications, before completing the application.

Applications must be submitted through the CSX Property Portal. Visit www.csx.com to establish an account and submit an application. Once on the site, use the following path: CUSTOMERS→CSX Real Estate→CSX Property Portal.

1.4 Right of Entry

a) Entry upon CSXT property for the purpose of conducting surveys, field inspections, obtaining soils information, or any other purposes associated with the design and construction for the proposed occupancy, will not be permitted without a proper entry permit prepared by CSXT. The applicant must pay the associated fees and execute the entry permit.

b) The issuance of an entry permit does not constitute authority to proceed with any construction. Construction cannot begin until a formal agreement is executed by CSXT and the Owner receives permission, from the designated inspection agency of CSXT, to proceed with the work.

1.5 Site Inspection

a) For longitudinal occupancy of CSXT property, a site inspection along the proposed pipeline route may be required before final design plans are prepared. When a site inspection is required, the applicant and/or the engineer must meet with a CSXT Field Representative to view the entire length of the proposed occupancy; the applicant will be informed of the need for a meeting during application processing.

b) Prior to the site inspection the applicant must submit the following information:

i) A plan view of the proposed route showing all tracks, both CSXT right-of-way lines, and all other facilities located on the right-of-way. The distance from the proposed pipeline to the adjacent track and to the right-of-way lines must be shown.

ii) A complete application form.

c) Site inspections for pipe crossings are not required unless, in the opinion of CSXT, the size and location of the facility warrant an inspection.

1.6 Information Required for Submission

a) All plans and documents required in the application package shall be submitted as per the instructions in the application package.

b) Failure to follow these instructions may result in the return of the information provided without further action taken.

1.7 Notification to Proceed with Outside Party Request Form

a) After approval of the engineering plans and full execution of the facility encroachment agreement, the Owner will receive an e-mail notification containing a special reference number and link to the CSX Property Portal – Outside Party Request Form application. CSX requires 30 days' advance notice to schedule any activity.

b) Once the OP Form is received, the Owner or their Contractor will be contacted to discuss construction scheduling.

c) CSXT will determine if the project requires flagging, construction monitoring, or both. All costs associated with flagging and/or construction monitoring will be the responsibility of the Owner. CSXT, at its sole discretion, may elect to have the Owner remit payment for the estimated flagging/construction monitoring cost in advance or elect to invoice the Owner the actual cost as incurred.

END OF PART 1

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PART 2 – GENERAL REQUIREMENTS

2.1 Use of Casing Pipe

a) A casing pipe will be required for all pipeline crossings carrying liquid or gaseous substances. The casing pipe for liquid and gaseous substances may be omitted if the proposed pipe will be installed by the horizontal directional drilling (HDD) method. Reference section 4.1.5 for additional information and requirements.

b) For natural gas pipelines, the casing pipe may be omitted provided the carrier pipe meets the requirements in the Uncased Pipelines Carrying Gas section of this document. CSXT may require the use of a casing pipe at locations where increased risks from specific site conditions (traffic speed, traffic density, etc.) are present.

c) For non-pressure sewer or drainage crossings, where the installation can be made by open cut (see Construction Requirements Section) or reinforced concrete pipe can be jacked under the railroad (see Construction Requirements Section), the casing pipe may be omitted.

d) Pressure pipelines that are located within 25 feet of the centerline of any track shall be encased.

e) At proposed pipe crossing the casing pipe shall be laid **across the entire width of the right-of-way**, except where a greater length is required to comply with the Design Requirements-Casing Pipe Section of this specification, even though such extension is beyond the right-of-way.

f) At the discretion of CSXT a casing pipe may be required for any application regardless of the commodity carried.

2.2 Location of Pipeline on the Right-of-Way

a) Pipelines laid longitudinally on CSXT's right-of-way shall be located as far as practicable from any tracks or other important structures and as close to the railroad property line as possible. Longitudinal pipelines must not be located in earth embankments or within ditches located on the right-of-way.

b) Pipelines shall be located, where practicable, to cross tracks at approximate right angles to the track, but preferably at not less than 45 degrees.

c) Pipelines shall not be placed within a culvert, under railroad bridges, nor closer than 45 feet to any portion of any railroad bridge, building, or other important structure, except in special cases, and then by special design, as approved by CSXT's Chief Engineer, Design and Construction. Proposed pipelines that are to be located within the public right-of-way will be considered pending engineering review. An effort should be made to maximize distance to any substructure.

d) Pipelines shall not be located within the limits of a turnout (switch) when crossing the track. The limits of the turnout extend from the point of the switch to 15 feet beyond the last long timber.

e) Pipeline installations shall not be designed as an open cut installation where the pipeline is to be located within the limits of a grade crossing. If it is shown that no other method of installation is possible, the owner will be responsible for reimbursing CSXT for all costs associated with the removal and reconstruction of the grade crossing (This cost will require advance funding by the pipeline owner).

f) Pipelines carrying liquefied petroleum gas shall, where practicable, cross the railroad where tracks are carried on embankment.

2.3 Depth of Installation

2.3.1 Pipelines conveying non-flammable substances

a) Casing/carrier pipes placed under CSXT track(s) shall be not less than 5.5 feet from base of rail to top of pipe at its shallowest point.

b) Pipelines laid longitudinally on CSXT's right-of-way, 50 feet or less from centerline track shall be buried not less than 4 feet from ground surface to top of pipe. Where the pipeline is laid more than 50 feet from centerline of track, the minimum cover shall be at least 3 feet.

2.3.2 Pipelines conveying flammable substances

a) Casing pipes under CSXT track(s) shall be not less than 5.5 feet from base of rail to top of pipe at its closest point. On other portions of the right-of-way, where the pipe is not directly beneath any track, the depth from ground surface or from bottom of ditch to top of pipe shall not be less than 3 feet. Where 3 feet of cover cannot be provided from bottom of ditch, a 6-inch thick reinforced concrete slab shall be provided over the pipeline for protection.

b) Uncased natural gas pipelines under CSXT track(s) shall not be less than 10 feet from the base of rail to the top of the pipe at its closest point and not less than 6 feet from ground surface to top of pipe in all other locations. Where it is not possible to obtain the above depths, use of a casing pipe will be required.

c) Pipelines laid longitudinally on CSXT's right-of-way, 50 feet or less from centerline track shall be buried not less than 6 feet from ground surface to top of pipe. Where the pipeline is laid more than 50 feet from centerline of track, the minimum cover shall be at least 5 feet.

2.3.3 Pipelines within Limits of a Dedicated Highway

a) Pipelines within the limits of a dedicated highway are subject to all the requirements of this specification and must be designed and installed in accordance with this specification.

b) The limits of the dedicated highway (right-of-way) must be clearly shown on the plans.

c) Construction cannot begin until an agreement has been executed between CSXT and the Owner and proper notification has been given to CSXT's Regional Engineering Officer (See Notification to Proceed with Outside Party Request Form).

2.4 Modification of Existing Facilities

a) Any replacement of an existing carrier pipe and/or casing shall be considered as a new installation, subject to the requirements of this specification.

b) Modification of an existing carrier pipe and/or casing pipe by in-place, non-intrusive methods, such as Cured-in-Place Pipe (CIPP), may be considered as maintenance if there is an agreement between CSXT and the owner covering the existing pipe(s).

c) CIPP installations will only be considered for the following scenarios:

i) Circular Pipes

ii) Within the following host pipe materials: brick, concrete, clay tile, vitrified clay, PVC, corrugated steel, cast and ductile iron, fiberglass, or AC pipe. CIPP will not be allowed within smooth wall steel pipes.

d) CIPP design and installation plans and calculations must be submitted to CSXT's Corridor Services (CS) office for an engineering review if the following scenarios exist:

i) Excavation within CSXT right-of-way or TREL is required to access the existing facilities.

ii) The host pipe that the CIPP is being applied to is not within a casing pipe, such that the host pipe and CIPP will be subject to all external loads.

iii) The CIPP will be within a pipe that is parallel or longitudinal to the CSXT tracks.

e) CIPP design requirements are included in the Cured-in-Place-Pipes (CIPP) section of this document.

2.5 Abandoned Facilities

a) The owner of all pipe crossings proposed for abandonment shall notify CSXT, in writing, of the intention to abandon.

b) Abandoned pipelines shall be removed or completely filled with cement grout, compacted sand, or other methods, as approved by CSXT.

c) Abandoned manholes and other structures shall be removed to a minimum depth of 2 feet below finished grade and completely filled with cement grout, compacted sand, or other methods as approved by CSXT.

2.6 Conflict of Specifications

a) Where laws or orders of public authority prescribe a higher degree of protection than specified herein, then the higher degree so prescribed shall be deemed a part of this specification.

2.7 Insulation

a) Pipelines and casings shall be suitably insulated from underground conduits carrying electric wires on CSXT property.

2.8 Corrosion Protection and Petroleum Leak Prevention

a) Pipelines on CSXT property that carry petroleum products, hazardous gases, or hazardous liquids shall be designed in accordance with current federal, state, and/or local regulations that mandate leak detection automatic shutoff, leak monitoring, sacrificial anodes, and/or exterior coatings to minimize corrosion and prevent petroleum releases.

2.9 Plastic Carrier Pipe Materials

a) Plastic carrier pipe materials include, but are not limited to thermoplastic and thermoset plastic pipes, Thermoplastic types include Polyvinyl Chloride (PVC), Acrylonitrile Butadiene Styrene (ABS), High Density Polyethylene (HDPE), Polyethylene (PE), Polybutylene (PB), Cellulose Acetate Butyrate (CAB), and Styrene Rubber (SR), Thermoset types include Reinforced Plastic Mortar (RPM), Reinforced Thermosetting Resin (FRP) and Fiberglass Reinforce Plastic (FRP).

b) Plastic carrier pipelines shall be encased according to AREMA Chapter 1 Section 5.1.5.

c) Plastic pipe material shall not be used to convey **liquid** flammable substances.

d) Plastic pipe material shall be resistant to the chemicals with which contact can be anticipated. Plastic carrier pipe shall not be utilized where there is potential for contact with petroleum contaminated soils or other non-polar organic compounds that may be present in surrounding soils.

e) Plastic carrier pipe can be utilized to convey flammable **gas** products provided the pipe material is compatible with the type of product conveyed and the maximum allowable operating pressure is less than 100 PSI. Carrier pipe materials, design, and installation shall conform to Code of Federal Regulation 49CFR§178 to §199, specifically §192 and American National Standards Institute ASME B31.8 and ASTM D2513. Codes, specifications, and regulations current at time of construction of the pipeline shall govern the installation of the facility within the railway right-of-way. The proof testing of the strength of carrier pipe shall be in accordance with ANSI requirements. Plastic carrier pipes will be encased according to AREMA Chapter 1 Section 5.1.5.

f) Plastic carrier pipe conveying flammable substances shall be encased the entire limits of the right-of-way. If special conditions exist which prevent encasement within the entire limits

of the right-of-way, the Chief Engineer, Design and Construction must approve the minimum encased length.

g) Plastic carrier pipe must be encased under all tracks, including sidings and industrial tracks within the limits of the right-of-way.

h) Longitudinal carrier pipeline shall be steel or ductile iron. Plastic carrier pipe may be utilized for longitudinal installation with approval by the Chief Engineer, Design and Construction, but shall be fully encased within the limits of the right-of-way.

i) Codes, specifications, and regulations current at the time of construction the pipeline shall govern the installation of the facility within the railway rights-of- way. The proof testing of the strength of carrier pipe shall be in accordance with ANSI requirements.

Specification Number	Carrier Pipe Properties
ANSI/AWWA C900	PVC pressure pipe 4” through 12”
ANSI/AWWA C901	PE pressure pipe and tubing ½” through 3” for water
ANSI/AWWA C902	PE pressure pipe and tubing ½” through 3” for water
ANSI/AWWA C905	PVC water pipe, 14” through 36”
ANSI/AWWA C906	PE pressure pipe and fittings 4” – 63” for water
ANSI/AWWA C907	PVC pressure fittings 4” – 8”
ANSI/AWWA C950	Fiberglass pressure pipe

END OF PART 2

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PART 3 – DESIGN REQUIREMENTS

3.1 Soil Investigation

3.1.1 General Requirements

a) Test borings or other soil investigations, approved by CSXT's Chief Engineer, Design and Construction, shall be made to determine the nature of the underlying material for all pipe crossings with casing pipe sizes greater or equal to 48 inches in diameter and larger under track(s).

b) Test borings or other soil investigations, approved by CSXT's Chief Engineer, Design and Construction, may be required when, in the judgment of CSXT, they are necessary to determine the adequacy of the design and construction of pipe crossings with casings less than 48 inches in diameter and for other facilities located on the right-of-way. Note: the applicant shall be responsible for the notification of all underground utilities including CSX signal cables.

3.1.2 Location

a) Borings shall be made on each side of the track(s), on the centerline of the pipe crossing, and as close to the track(s) as practicable. **Entry upon CSXT property for the purpose of conducting borings requires a Right of Entry permit.**

b) Test boring logs shall be accompanied with a plan, drawn to scale, showing the location of the borings in relation to the track(s) and the proposed pipe.

3.1.3 Sampling

a) Test borings shall be made in accordance with current ASTM Designation D1586 except that sampling must be continuous from the ground surface to 5 feet below the proposed invert unless rock is encountered before this depth. Where rock is encountered, it is to be cored using a Series "M" Double Tube Core Barrel, with a diamond bit, capable of retrieving a rock core at least 1 5/8" in diameter. Individual core runs are not to exceed 5 feet in length.

b) All borings shall be sealed, for their full depth, with a 4-3-1 bentonite-cement- sand grout after accurate ground water readings have been taken and recorded.

c) Soil samples taken from auger vanes or return washwater are not acceptable.

3.1.4 Boring Logs

a) Test boring logs shall clearly indicate **all** of the following:

i) Boring number as shown on the required boring location plan.

ii) Ground elevation at each boring using same datum as the pipeline construction plans.

iii) Engineering description of soils or rock encountered.

iv) Depth and percent recovery of all soil samples.

v) Depth from surface for each change in strata.

vi) Blows for each 6 inches of penetration for the standard penetration test described in ASTM D 1586. Blows for lesser penetrations should be recorded.

vii) Percent recovery and Rock Quality Designation (RQD) for all rock cores.

viii) Depth to ground water while sampling and when it has stabilized in the bore hole.

b) The location of the carrier pipe and/or casing pipe shall be superimposed on the boring logs before submission to CSXT.

3.1.5 Additional Information

a) When directed by CSXT, additional borings may be required for the purpose of taking undisturbed thin-wall piston samples or Dennison type samples for laboratory testing to determine the index and engineering properties of certain soil strata.

3.2 Design Loads

3.2.1 General Requirements

a) All pipes, manholes, and other facilities shall be designed for the external and internal loads to which they will be subjected.

b) To allow for placement of additional track(s) or shifting of the existing track(s), all proposed pipelines or structures shall be designed as if a railroad loading is directly above the facility.

3.2.2 Earth Load

a) The dead load of the earth shall be considered as 120 pounds per cubic foot unless soil conditions warrant the use of a higher value.

3.2.3 Railroad Load (live load and impact)

a) The railroad live load used shall be a Cooper E-80 loading. This loading consists of 80 kip axle loads spaced 5 feet on centers.

b) An impact factor of 1.75 (multiply live load by the impact factor) shall be used for depth of cover up to 5 feet. Between 5 and 30 feet, the impact factor is reduced by 0.03 per foot of depth. Below a depth of 30 feet, the impact factor is one.

c) The values shown in Table 1 shall be used for the vertical pressure on a buried structure for the various heights of cover.

Table 1 - Live loads, including impact for various heights of cover for a Cooper E-80 loading

Height of Cover	Load	
Feet	Pound per square foot	(kPa)
2	3800	(162.8)
3	3150	(150.8)
4	2850	(136.5)
5	2550	(122.1)
6	2250	(107.7)
7	1950	(93.4)
8	1700	(81.4)
9	1500	(71.8)
10	1300	(62.2)
12	1000	(47.9)
14	800	(38.3)
16	625	(29.9)
18	500	(23.9)
20	400	(19.2)
25	250	(12.0)
30	150	(7.2)

d) To determine the horizontal pressure caused by the railroad loading on a sheet pile wall or other structure adjacent to the track, the Boussinesq analysis shall be used. The load on the track shall be taken as a strip load with a width equal to the length of the ties which is typically, 8.5 feet. The vertical surcharge, q (psf), caused by each axle, shall be uniform and equal to the axle load divided by the tie length and the axle spacing, 5 feet. For the E-80 loading this results in:

$$q = 80{,}000 / (8.5 \text{ X } 5) = 1882 \text{ psf}$$

The horizontal pressure due to the live load surcharge at any point on the wall or other structure is p_h and can be calculated by the following:

$$p_h = (2q/\pi)(\beta\text{-sin }\beta(\cos 2\propto))$$

e) The vertical and horizontal pressures given above shall be used unless an alternate design method is approved by CSXT. Proposals to use an alternate design method must include acceptable references and a statement explaining the justification for choosing the alternate method.

3.3 Design Assumptions

a) To design a casing pipe or an uncased carrier pipe for the external loads on CSXT's right-of-way, the following design assumptions shall be used, unless site conditions indicate more conservative values are required:

3.3.1 Flexible Pipe (Steel, DIP, CMP, and Tunnel Liner Plate)

a) Steel Pipe (Bored and jacked in place)

i) Spangler's Iowa formula shall be used for design with:

Deflection lag factor	-	$D_f = 1.5$
Modulus of soil reaction	-	$E' = 1080$ psi
Bedding constant	-	$Kb = 0.096$
Soil loading constant	-	$K_{u'} = 0.13$
Allowable deflection of pipe	-	3% of pipe diameter

b) Ductile Iron Pipe (Open Cut)

i) AWWA Specification C150 shall be used for design with:

Pipe laying condition = Type 3
Earth load - ANSI A 51.50 prism method

c) Corrugated Steel Pipe & Corrugated Structural Steel Plate Pipe (Open Cut)

i) AREMA Chapter 1, Sections 4.9 & 4.10 shall be used for design with:

Soil stiffness factor - $K = 0.33$
Railroad impact as per Design Requirements-Casing Pipe Section of this specification.

d) Tunnel Liner Plate (Tunneled)

i) AREMA Chapter 1, Part 4, Section 4.16 shall be used for design with:

Soil stiffness factor - $K = 0.33$
Railroad impact as per Design Requirements-Casing Pipe Section of this specification.

3.3.2 Rigid Pipe (RCP, Vitrified Clay Pipe, and PCCP)

a) Reinforced Concrete Pipe, Vitrified Clay Pipe and Prestressed Concrete Cylinder Pipe (Open Cut)

i) American Concrete Pipe Association design manual shall be used for design with:

Marston load theory used for earth load

Bedding (Load Factor) - $L_f = 1.9$
Factor of safety - FS = 1.25 for RCP
FS = 1.50 for VCP
Railroad impact as per Design Requirements-Casing Pipe Section of this specification.

b) Reinforced Concrete Pipe (Jacked)

i) American Concrete Pipe Association design manual shall be used for design with:

Marston load theory used for earth load
Bedding (Load Factor) - $L_f = 3.0$
Factor of safety = 1.25
Railroad impact as per Design Requirements-Design Loads Section of this specification.
Others – As approved by CSXT

3.4 Casing Pipe

3.4.1 General Requirements

a) Casing pipe shall be so constructed as to prevent leakage of any substance from the casing throughout its length, except at ends of casing where ends are left open, or through vent pipes when ends of casing are sealed. Casing shall be installed so as to prevent the formation of a waterway under the railroad, and with an even bearing throughout its length, and shall slope to one end (except for longitudinal occupancy).

b) The casing pipe and joints shall be of steel and of leakproof construction when the pipeline is carrying liquid flammable products or highly volatile substances under pressure.

c) The inside diameter of the casing pipe shall be such as to allow the carrier pipe to be removed subsequently without disturbing the casing or the roadbed. For steel pipe casings, the inside diameter of the casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings, for carrier pipe less than 6 inches in diameter; and at least 4 inches greater for carrier pipe 6 inches and over in diameter.

d) For flexible casing pipe, a maximum vertical deflection of the casing pipe of 3 percent of its diameter, plus ½ inch (13 mm) clearance shall be provided so that no loads from the roadbed, track, traffic, or casing pipe itself are transmitted to the carrier pipe. When insulators are used on the carrier pipe, the inside diameter of the flexible casing pipe shall be at least 2 inches greater than the outside diameter of the carrier pipe for pipe less than 8 inches in diameter; at least 3¼ inches greater for pipe 8 inches to 16 inches, inclusive, in diameter and at least 4½ inches greater for pipe 18 inches and over in diameter.

e) In no event shall the casing pipe diameter be larger than is necessary to permit the insertion of the carrier pipe.

f) Casing pipe under railroad tracks and across CSXT's right-of-way shall extend the **greater** of the following distances, measured at right angle to centerline of track:

i) Across the entire width of the CSXT right-of-way.

ii) 3 feet beyond ditch line.

iii) 2 feet beyond toe of slope.

iv) A minimum distance of 25 feet from each side of centerline of outside track when casing is sealed at both ends.

v) A minimum distance of 45 feet from centerline of outside track when casing is open at both ends.

vi) Beyond the theoretical railroad embankment line. This line begins at a point 12 feet horizontally from centerline track, 18 inches below top-of-rail, and extends downward on a 1½ (H) to 1 (V) slope.

g) If additional tracks are constructed in the future, the casing shall be extended correspondingly at the Owner's expense.

3.4.2 Steel Pipe

a) Steel pipe may be installed by open cut, boring or jacking depending on situation.

b) Steel pipe shall have a specified minimum yield strength, SMYS, of at least 35,000 psi. The ASTM or API specification and grade for the pipe are to be shown on the Application Form.

c) Joints between the sections of pipe shall be constructed to be capable of withstanding railroad loading. Joints can either be constructed through butt welding or through the use of interlocking joints.

d) Steel casing pipe, with a **minimum** cover of 5.5 ft., shall have a minimum wall thickness as shown in Table 2, unless computations indicate that a thicker wall is required.

Table 2 – Steel Casing Pipe Wall Thicknesses

Pipe Diameter Nominal Pipe Size (in.)	Coated or Cathodically Protected Nominal Wall Thickness (in.)	Uncoated and Unprotected Nominal Wall Thickness (in.)
10 and under	0.188	0.188
12 & 14	0.188	0.250
16	0.219	0.281
18	0.250	0.312
20 & 22	0.281	0.344
24	0.312	0.375
26	0.344	0.406
28	0.375	0.438
30	0.406	0.469
32	0.438	0.500
34 & 36	0.469	0.532
38	0.500	0.562
40	0.531	0.594
42	0.562	0.625
44 & 46	0.594	0.657
48	0.625	0.688
50	0.656	0.719
52	0.688	0.750
54	0.719	0.781
56 & 58	0.750	0.812
60	0.781	0.844
62	0.812	0.875
64	0.844	0.906
66 & 68	0.875	0.938
70	0.906	0.969
72	0.938	1.000

e) Coated steel pipe that is bored or jacked into place shall conform to the wall thickness requirements for uncoated steel pipe since the coating may be damaged during installation.

f) For the required wall thicknesses on uncased steel carrier pipes conveying natural gas, refer to Uncased Pipelines Carrying Gas section in this document.

g) Smooth wall steel pipes with a nominal diameter over 72 inches will not be permitted.

3.4.3 Ductile Iron Pipe

a) Ductile iron pipe may be used only at the sole discretion of the Chief Engineer, Design and Construction when placed by the open cut method. Jacking or boring through the railroad embankment is not permitted due to the bell and spigot joints.

b) Ductile iron pipe shall conform to the requirements of ANSI A21.51/AWWA C-151. Class 56 pipe shall be used unless computations, in accordance with the Design Requirements-Design Loads and Design Assumptions sections, are provided.

c) Table 3 is based on the design assumptions given in the Design Requirements-Design Loads Section with a minimum cover of 5.5 feet. This table is provided for information only.

Table 3 – Ductile Iron Pipe Wall Thicknesses

Pipe Diameter (in.)	Thickness Class		Pressure Class
	Wall Thickness (in.)	Class	
3	0.25	51	350
4	0.25	51	350
6	0.25	50	350
8	0.25	50	350
10	0.26	51	350
12	0.28	51	350
14	0.31	52	350
16	0.34	52	350
18	0.36	53	350
20	0.38	53	350
24	0.42	55	350
30	0.49	56	350
36	0.56	56	350
42	0.63	56	350
48	0.70	56	350
54	0.79	56	350

d) The pipe shall have mechanical or push on type joints.

3.4.4 Corrugated Steel Pipe and Corrugated Structural Steel Plate Pipe

a) Corrugated steel pipe and corrugated structural steel plate pipe may be used for a casing only when placed by the open cut method. Jacking or boring through the railroad embankment is not permitted.

b) Corrugated steel pipe and corrugated structural steel plate pipe may be used for a casing provided the pressure in the carrier pipe is less than 100 psi.

c) Pipe shall be bituminous coated and shall conform to the current AREMA Specifications Chapter 1, Part 4.

d) Corrugated steel pipe shall have a minimum sheet thickness as shown in Table 4. Corrugated structural steel plate pipe shall have a minimum plate thickness of 8 gage, 0.168 in. If computations indicate that a greater thickness is required, the thicker sheet or plate shall be used.

Table 4 – Corrugated Steel Pipe Wall Thicknesses

Pipe Diameter	Sheet Thickness	
(in.)	(Gauge)	(in.)
12 to 30	14	0.079
36	12	0.109
42 to 54	10	0.138
60 to 120	8	0.168

3.4.5 Steel Tunnel Liner Plate

a) Liner plates shall be installed by the tunneling method as detailed in the Construction Requirements-Method of Installation section of this specification.

b) Tunnel liner plates shall be galvanized and bituminous coated and shall conform to current AREMA guidelines. If the tunnel liner plates are used only to maintain a tunneled opening until the carrier pipe is installed, and the annular space between the carrier pipe and the tunnel liner is completely filled with cement grout within a reasonably short time after completion of the tunnel, then the tunnel liner plates need not be galvanized and coated.

c) Tunnel liner plates are to be a minimum of 12 gage and shall be fabricated from structural quality, hot-rolled, carbon-steel sheets or plates conforming to ASTM Specification A 1011.

d) The following liner plate information must be shown on the Application Form:

i) Number of flanges (2 or 4)

ii) Width of plate

iii) Type of plate (smooth or corrugated)

3.4.6 Reinforced Concrete Pipe

a) Reinforced concrete pipe shall be installed by the open cut (at the sole discretion of the Chief Engineer, Design and Construction) or jacking method.

b) Reinforced concrete pipe shall conform to ASTM Specification C 76. Class V pipe, Wall B or C shall be used unless computations, in accordance with the Design Requirements-Design Assumptions, are provided.

c) Reinforced concrete pipe may be used for a casing provided the pressure in the carrier pipe is less than 100 psi.

d) Pipe placed by open cut shall be installed in accordance with AREMA Guidelines except that backfill and compaction shall be in accordance with the Construction Requirements-Method of Installation section of this specification.

e) Pipe jacked into place shall have tongue and groove joints and shall be installed in accordance with the Construction Requirements-Method of Installation section of this specification.

f) Joints between sections of the RCP shall be sealed with a gasket conforming to ASTM C 443 or approved equal**.**

3.4.7 Concrete Encasement

a) At locations where the installation is by open cut and a casing pipe is required, but cannot be installed due to elbows or other obstructions, concrete encasement may be used when approved by CSXT.

b) The concrete encasement must provide a minimum cover of 6 inches of concrete around the pipe. A 6 x 6 - W 2.9 x W 2.9 welded wire fabric shall be placed in the concrete on all sides.

3.5 Carrier Pipe

3.5.1 General Requirements

a) The pipe shall be laid with sufficient slack so that it is not in tension.

b) Steel pipe shall not be used to convey sewage, storm water, or other liquids that could cause corrosion.

c) Carrier pipes located on CSXT's right-of-way or under tracks which CSXT operates, shall be manufactured in accordance with the following specifications:

i) Steel Pipe - The ASTM or API specification and grade for the pipe is to be shown on the Application Form. The specified minimum yield strength is to be at least 35,000 psi. For flammable substances, see the Design Requirements-Carrier Pipe Section of this document for additional requirements.

ii) Ductile Iron Pipe - ANSI A21.51/AWWA C151

iii) Corrugated Metal Pipe - AREMA Chapter 1, Part 4

iv) Reinforced Concrete Pipe - ASTM C 76

v) Vitrified Clay Pipe - ASTM C 700

vi) Prestressed Concrete Cylinder Pipe - AWWA C301

vii) Reinforced Concrete Cylinder Pipe - AWWA C300

viii) Others - As approved by CSXT.

d) Carrier pipes installed within a casing pipe shall be designed for the internal pressure to which it will be subjected.

e) Gravity flow carrier pipes, installed without a casing pipe, shall meet the requirements, of the particular pipe material, as given in Design Requirements-Casing Pipe Section of this specification.

f) Design computations, stamped by a Professional Engineer, must be submitted for all uncased pressure pipelines installed on CSXT's right-of- way. The pipe must be designed for the internal and external loads (see the Design Requirements Section of this document) to which it may be subjected. The design assumptions given in Design Requirements Section shall apply.

3.5.2 Pipelines Carrying Flammable Substances

a) Products shall be of steel and conform to the requirements of the current ASME B 31.4 Liquid Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols, and other applicable ASME codes, except that the maximum allowable stresses for design of steel pipe shall not exceed the following percentages of the specified minimum yield strength (multiplied by the longitudinal joint factor) of the pipe as defined in the above codes:

b) The following percentages apply to hoop stress in steel pipe within a casing under railroad tracks, across railroad right-of-way and longitudinally on railroad right-of-way:

i) Seventy-two percent on oil pipelines.

ii) Fifty percent for pipelines carrying condensate, natural gasoline, natural gas liquids, liquefied petroleum gas, and other liquid petroleum products.

iii) Sixty percent for installations on gas pipelines.

c) The following percentages apply to hoop stress in steel pipe laid longitudinally on railroad right-of-way without a casing:

i) Sixty percent for oil pipelines.

ii) Forty percent for pipelines carrying condensate, natural gasoline, natural gas liquids, liquefied petroleum gas, and other liquid petroleum products.

d) Computations, based on the above requirements and stamped by a Professional Engineer shall be submitted with the application for occupancy.

3.5.3 Uncased Pipelines Carrying Gas

a) Pipelines carrying flammable and nonflammable gas products shall be steel and shall conform to the requirements of the current ASME B 31.8 Gas Transmission and Distribution Piping Systems, and other applicable ANSI codes.

b) The minimum wall thickness for uncased carrier pipe shall be in accordance with the values provided in AREMA, Chapter 1, Part 5, Section 5.2.

c) A durable coating, which will resist abrasion (fusion bonded epoxy or other suitable material), shall be used to protect the uncased pipeline when the boring method of installation is used.

d) If CSXT determines there is the potential for damage to the uncased pipeline (foreign material in the subgrade, third party damage, etc.), special protection of the pipeline will be required. Special protection may include the use of concrete jacketed carrier pipe, a protection slab over the pipeline, increased depth of bury or other means.

3.6 Casing Pipe End Seals

a) Casings for carrier pipes of flammable and hazardous substances shall be suitably sealed to the outside of the carrier pipe. Details of the end seals shall be shown on the plans.

b) Casings for carrier pipes of non-flammable substances shall have both ends of the casing blocked up in such a way as to prevent the entrance of foreign material, but allowing leakage to pass in the event of a carrier break.

c) The ends of a casing pipe may be left open when the ends are at or above ground surface and above high water level, provided drainage is afforded in such a manner that leakage will be conducted away from railroad tracks and structures.

3.7 Vents

a) Sealed casings for flammable substances shall be properly vented. Vent pipes shall be of sufficient diameter, but in no case less than two inches in diameter, and shall be attached near each end of the casing and project through the ground surface at right-of-way lines or not less than 45 feet, measured at right angles from centerline of nearest track.

b) Vent pipes shall extend not less than 4 feet above the ground surface. Top of vent pipe shall have a down-turned elbow, properly screened, or a relief valve. Vents in locations subject to high water shall be extended above the maximum elevation of high water and shall be supported and protected in a manner approved by CSXT.

c) Vent pipes shall be at least 4 feet, vertically, from aerial electric wires or greater if required by National Electrical Safety Code (ANSI C2).

d) When the pipeline is in a public highway, street-type vents shall be installed.

3.8 Signs

a) All pipelines (except those in streets where it would not be practical to do so) shall be prominently marked at right-of-way lines (on both sides of track for crossings) by durable, weatherproof signs located over the centerline of the pipe. Signs shall show the following:

i) Name and address of owner

ii) Contents of pipe

iii) Pressure in pipe

iv) Pipe depth below grade at point of a sign

v) Emergency telephone number in event of pipe rupture

b) For pipelines running longitudinally on CSXT property, signs shall be placed over the pipe (or offset and appropriately marked) at all changes in direction of the pipeline. Such signs should also be located so that when standing at one sign the next adjacent marker in either direction is visible. In no event shall they be placed more than 500 feet apart unless otherwise specified by CSXT.

c) The Owner must maintain all signs on CSXT's right-of-way as long as the occupational agreement is in effect.

3.9 Warning Tape

a) All pressure pipelines installed by the trench method, without a casing, shall have a warning tape placed directly above the pipeline, 2 feet below the ground surface.

3.10 Shut-off Valves

a) Accessible emergency shut-off valves shall be installed within 2,000 feet on both sides of the pipeline crossing or longitudinal occupancy.

b) Steel pipelines conveying Natural Gas may exceed the 2,000 foot spacing requirement provided the following conditions are met:

i) The pipeline is equipped with Automatic or Remotely Controlled shut-off valves.

ii) Location of valves shall be in compliance with all State and Federal Regulations.

iii) The pipeline is monitored on a continuous, 24 hour - 365 day basis from a central control center.

iv) The pipeline operator shall provide CSXT with current emergency contact information

3.11 Cathodic Protection

a) Cathodic protection shall be applied to all pipelines carrying flammable substances on CSXT's right-of-way.

b) For crossings and at other locations where the pipeline must be placed within a casing, the casing is to have cathodic protection or the wall thickness is to be increased to the requirements of the Design Requirements Section Table 2.

c) Uncased gas carrier pipes must be coated and cathodically protected to industry standards and test sites, for monitoring the pipeline, provided within 50 feet of the crossing.

d) Where casing and/or carrier pipes are cathodically protected by other than anodes, CSXT shall be notified and a suitable test made to ensure that other railroad structures and facilities are adequately protected from the cathodic current in accordance with the recommendation of current Reports of Correlating Committee on Cathodic Protection, published by the National Association of Corrosion Engineers.

e) Where sacrificial anodes are used, the locations shall be marked with durable signs.

3.12 Manholes

a) Manholes shall not be located on CSXT property where possible. At locations where this is not practical, including longitudinal occupancies, manholes shall be precast concrete sections conforming to ASTM Designation C 478, "Specification for Precast Concrete Manhole Sections."

b) The top of manholes located on CSXT property shall be flush with top of ground.

c) The distance from centerline of adjacent track to centerline of proposed manhole shall be shown on the plans.

3.13 Box Culverts

a) Reinforced concrete box culverts shall be designed in conformance with CSX Standards and AREMA Guidelines.

3.14 Drainage

a) Occupancies shall be designed, and their construction shall be accomplished, so that adequate and uninterrupted drainage of CSXT's right-of-way is maintained.

b) All pipes, ditches, and other structures carrying surface drainage on CSXT property and/or under CSXT track(s) shall be designed to carry the run-off from a one hundred (100) year storm. Plans submitted to CSXT for approval shall be prepared by a Professional Engineer and should indicate design, suitable topographic plan, and outline of total drainage area.

c) If the drainage is to discharge into an existing drainage channel on CSXT's right- of-way and/or through a drainage structure under CSXT's track(s), the computations must include the hydraulic analysis of any existing ditch and/or structure.

d) When calculating the capacity of existing or proposed drainage structures, under CSXT's track(s), the headwater calculation at the structure shall not be greater than one (1) pipe diameter.

e) Pipe(s) used to carry surface drainage on CSXT's right-of-way shall have a minimum diameter of 24 inches.

f) Detention ponds must not be placed on any part of CSXT's right-of-way. Also, the railroad embankment must not be used as any part of a detention pond structure.

g) Formal approval of the proposed design, by the appropriate governmental agency having jurisdiction, shall be submitted with the drainage computations.

3.15 Pipelines on Bridges

a) Pipelines **cannot** be installed on any bridge carrying CSXT tracks.

b) Overhead pipe bridges will only be considered over CSXT right-of-way when underground installation of the pipeline is not possible. The Applicant must show that no practicable alternative is available and overhead pipe bridges will be permitted provided the conditions in Section 3.17 are met.

c) Pipelines carrying flammable substances or non-flammable substances, which by their nature might cause damage if escaping on or near railroad facilities or personnel, shall not be installed on bridges over CSXT tracks. In special cases when it can be demonstrated to CSXT's satisfaction that such an installation is necessary and that no practicable alternative is available, CSXT may permit the installation and only by special design approved by the Chief Engineer, Design and Construction.

d) When permitted, pipelines on bridges over CSXT tracks shall be so located as to minimize the possibility of damage from vehicles, railroad equipment, vandalism, and other external causes. They shall be encased in a casing pipe as directed by CSXT.

3.16 Cured-in-Place Pipes (CIPP)

a) CIPP installations shall be designed in accordance with ASTM F1216 Appendix X1.

b) CIPP to be installed in a casing pipe or an uncased carrier pipe shall be designed for a Fully Deteriorated condition. A Partially Deteriorated design condition will only be accepted for CIPP of carrier pipe that is already within a casing pipe. All CIPP calculations must be signed and sealed by a licensed Professional Engineer.

c) CIPP designs will not be accepted when the wall thickness of the CIPP liner is greater than 2 inches.

3.17 Pipe Bridges / Conveyors

a) The following are minimum requirements for the construction of pipe bridges:

i) The vertical clearance, distance from top of rail to closest component of structure, is shown and is a minimum of 23 feet, measured at a point 6 feet horizontally from centerline track.

ii) The support bents for the overhead structure are located off CSXT's right-of-way or a minimum clear distance of 20 feet from centerline track, whichever distance is greater.

iii) Support bents within 25 feet of centerline track have pier protection in accordance with AREMA, Chapter 8 Section 2.1.5.

iv) Complete structural plans and design computations for the structure and foundations, sealed by a licensed Professional Engineer, are submitted with the application.

v) A fence (topped with barbed wire) or other measures are provided which will prevent access to the bridge by unauthorized personnel or vandals.

b) The following are minimum requirements for the construction of conveyors:

i) The vertical clearance, distance from top of rail to closest component of structure, is shown and is a minimum of 23 feet, measured at a point 6 feet horizontally from centerline track.

ii) The support bents for the overhead structure are located off CSXT's right-of-way or a minimum clear distance of 20 feet from centerline track, whichever distance is greater.

iii) Support bents within 25 feet of centerline track have pier protection in accordance with AREMA, Chapter 8 Section 2.1.5.

iv) Complete structural plans and design computations for the structure and foundations, sealed by a licensed Professional Engineer, are submitted with the application.

v) A fence (topped with barbed wire) or other measures are provided which will prevent access to the bridge by unauthorized personnel or vandals.

vi) Plan revisions, if applicable, are to include all proposed utilities attached to the proposed conveyor that do not service the conveyor.

END OF PART 3

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PART 4 – CONSTRUCTION REQUIREMENTS

4.1 Method of Installation

4.1.1 General Requirements

a) Bored, jacked, or tunneled installations shall have a bore hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating.

b) The use of water or other liquids to facilitate casing emplacement and spoil removal is prohibited.

c) If, during installation, an obstruction is encountered which prevents installation of the pipe in accordance with this specification, notify CSXT immediately, abandon the pipe in place, and immediately fill with grout. A new installation procedure and revised plans must be submitted to, and approved by, CSXT before work can resume.

4.1.2 Bore and Jack (Steel Pipe)

a) This method consists of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.

b) The boring operation shall be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.

c) The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that no unsupported excavation is ahead of the pipe.

d) The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered.

e) The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than ½ inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe (plus coating) by more than approximately 1 inch grouting (see the Construction Requirements-Grouting Section) or other methods approved by CSXT, shall be employed to fill such voids.

f) The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.

g) Plans and description of the arrangement to be used shall be submitted to CSXT for approval and no work shall proceed until such approval is obtained.

h) Any method that employs simultaneous boring and jacking for pipes over 8 inches in diameter that does not have above approved arrangement **will not be permitted**. For pipe 8 inches and less in diameter, auguring or boring without this arrangement may be considered for use only as approved by CSXT.

4.1.3 Jacking (RCP and Steel Pipe)

a) This method consists of pushing sections of pipe into position with jacks placed against a backstop and excavation performed by hand from within the jacking shield at the head of the pipe. Ordinarily 36 inch pipe is the least size that should be used, since it is not practical to work within smaller diameter pipes.

b) Jacking shall be in accordance with the current AREMA Guidelines, Chapter 1, Section 4.13, "Earth Boring and Jacking Culvert Pipe Through Fills." This operation shall be conducted without hand mining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment.

c) Bracing and backstops shall be so designed and jacks of sufficient rating used so that the jacking can be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.

d) When jacking reinforced concrete pipe, a jacking shield shall be fabricated as a special section of reinforced concrete pipe with a steel cutting edge, hood, breasting attachments, etc., cast into the pipe. The wall thickness and reinforcing shall be designed for the jacking stresses.

e) When jacking reinforced concrete pipe tapped for no smaller than 1½- inch pipe, grout holes shall be cast into the pipe at manufacture. Three grout holes equally spaced around the circumference and 4 feet longitudinally shall be provided for greater than 54 inches and smaller. Four grout holes equally spaced around the circumference and 4 feet longitudinally shall be provided for RCP 60 inches and larger.

f) Immediately upon completion of jacking operations, the installation shall be pressure grouted as per Construction Requirements-Grouting Section of this specification.

4.1.4 Tunneling (Tunnel Liner Plate)

a) This method consists of placing rings of liner plate within the tail section of a tunneling shield or tunneling machine. A tunneling shield shall be used for all liner plate installations unless otherwise approved by CSXT.

b) The shield shall be of steel construction, designed to support a railroad track loading as specified in the Design Requirements-Casing Pipe of this specification, in addition to the other loadings imposed. The advancing face shall be provided with a hood, extending no less than 20 inches beyond the face and extending around no less than the upper 240 degrees of the total circumference. It shall be of sufficient length to permit the installation of at least one complete ring of liner plates within the shield before it is advanced for the installation of the next ring of liner plates. The shield shall conform to and not exceed the outside dimensions of the liner plate tunnel being placed by more than 1 inch at any point on the periphery unless otherwise approved by CSXT.

c) The shield shall be adequately braced and provided with necessary appurtenances for completely bulkheading the face with horizontal breastboards, and arranged so that the excavation can be benched as may be necessary. Excavation shall not be advanced beyond the edge of the hood, except in rock.

d) Manufacturer's shop detail plans and manufacturer's computations showing the ability of the tunnel liner plates to resist the jacking stresses shall be submitted to CSXT for approval.

e) Unless otherwise approved by CSXT, the tunneling shall be conducted continuously, on a 24-hour basis, until the tunnel liner extends at least beyond the theoretical railroad embankment line.

f) At any interruption of the tunneling operation, the heading shall be completely bulkheaded.

g) The liner plates shall have tapped grout holes for no smaller than 1½- inch pipe, spaced at approximately 3 feet around the circumference of the tunnel liner and 4 feet longitudinally.

h) Grouting behind the liner plates shall be in accordance with the Construction Requirements-Grouting Section of this specification.

4.1.5 Horizontal Directional Drilling

a) **Installations by this method are considered a variance to CSXT Pipeline Occupancy Specifications,** but special consideration will be given where the depth of cover is substantial, 15 feet or greater, or the bore is in rock. Factors considered will be track usage, pipe size, contents of pipeline, soil conditions, boring equipment and procedures, etc. Reference the CSXT Interim Guidelines for Horizontal Directional Drilling (HDD) for additional information and instructions.

4.1.6 Jack Conduit

a) Installations by this method are generally not acceptable, but may be considered under special circumstances. This method consists of using hydraulic jacking equipment to push a solid steel rod under the railroad from a launching pit to a receiving pit. At the receiving pit, a cone shaped “expander” is attached to the end of the rod and the conduit (casing pipe) is attached to the expander. The rod, expander, and conduit are then pulled back from the launching pit until the full length of the conduit is in place.

b) This method may be used to place steel conduit (casing pipe), up to and including 6 inches in diameter, under the railroad.

c) The project specifications must require the contractor to submit, to CSXT for approval, a complete construction procedure of the proposed boring operation. Included with the submission shall be the manufacturer’s catalog information describing the type of equipment to be used.

4.1.7 Open Cut – Not a readily accepted practice

a) The Owner must request open cut approval when making application for occupancy. All procedures will be in compliance with AREMA Chapter 1 Section 5.1.5.1(b).

b) Installations beneath the track by open trench methods will be permitted only with the approval of the Chief Engineer, Design and Construction.

c) Installations by open cut will not be permitted under mainline tracks, tracks carrying heavy tonnage or tracks carrying passenger trains. Also, open cut shall not be used within the limits of a highway/railroad grade crossing or its approaches, 25 feet either side of traveled way, where possible.

d) Rigid pipe (RCP, VCP, and PCCP) must be placed in a Class B bedding or better.

e) At locations where open cut is permitted, the trench is to be backfilled with crushed stone with a top size of the aggregate to be a maximum of 2 inches and to have no more than 5% passing the number 200 sieve. The gradation of the material is to be such that a dense stable mass is produced.

f) The backfill material shall be placed in loose 6 inch lifts and compacted to at least 95% of its maximum density with a moisture content that is no more than 1% greater than or 2% less than the optimum moisture as determined in accordance with current ASTM Designation D - 1557 (Modified Proctor). When the backfill material is within 3 feet of the subgrade elevation (the interface of the ballast and the subsoil) a compaction of at least 98% will be required. Compaction test results confirming compliance must be provided to CSXT's Regional Engineering Office by the Owner.

g) All backfilled pipes laid either perpendicular or parallel to the tracks must be designed so that the backfill material will be positively drained. This may require the placement of lateral drains on pipes laid longitudinally to the track and the installation of stub perforated pipes at the edge of the slopes.

h) Unless otherwise agreed upon, all work involving rail, ties, and other track material will be performed by railroad employees at the sole expense of the Owner, subject to advance payments by the owner.

4.2 Grouting

a) For jacked and tunneled installations a uniform mixture of 1:6 (cement: sand) cement grout shall be placed under pressure through the grout holes to fill any voids, which exist between the pipe or liner plate and the undisturbed earth.

b) Grouting shall start at the lowest hole in each grout panel and proceed upwards simultaneously on both sides of the pipe.

c) A threaded plug shall be installed in each grout hole as the grouting is completed at that hole.

d) When grouting tunnel liner plates, grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates if necessary. Grouting shall proceed as directed by CSXT, but in no event shall more than 6 lineal feet of tunnel be progressed beyond the grouting.

4.3 Soil Stabilization

a) Pressure grouting of the soils or freezing of the soils before jacking, boring, or tunneling may be required at the direction of CSXT Chief Engineer, Design and Construction to stabilize the soils, control water, prevent loss of material, and prevent settlement or displacement of embankment. Grout shall be cement, chemical, or other special injection material selected to accomplish the necessary stabilization.

b) The materials to be used and the method of injection shall be prepared by a Licensed Professional Soils Engineer, or by an experienced and qualified company specializing in this work and submitted for approval to CSXT before the start of work. Proof of experience and competency shall accompany the submission.

4.4 Dewatering

a) When water is known or expected to be encountered all plans and specification must be submitted to the Chief Engineer, Design and Construction for approval before the process begins. Pumps of sufficient capacity to handle the flow shall be maintained at the site, provided the contractor has received approval from CSXT to operate them. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgment of CSXT, the operation can be safely halted. When dewatering, a process for monitoring for any settlement of track or structures must be in place.

4.5 Safety Requirements

a) All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains nor damage, destroy, or endanger the integrity of railroad facilities. All work on or near CSXT property shall be conducted in accordance with CSXT safety rules and regulations. Specifically all licensee's employees and agents, while on CSXT property, shall be required to wear an orange hard hart, safety glasses with side shields, 6" lace up boots with a distinct heel, shirts with sleeves, and long pants; additional personal protective equipment may be required for certain operations including abrasive cutting, use of torches, use of chainsaws, etc. The contractor and its employees shall comply with the CSXT safety rules at all times while occupying CSXT's property. Operations will be subject to CSXT inspection at any and all times.

b) All cranes, lifts, or other equipment that will be operated in the vicinity of the railroad's electrification and power transmission facilities shall be electrically grounded as directed by CSXT. Use of a crane or other lifting equipment is subject to requirements as stated in the CSXT Public Projects manual.

c) Whenever equipment or personnel are working closer than 25 feet from the centerline of an adjacent track, that track shall be considered as being obstructed. Insofar as possible, all operations shall be conducted no less than this distance. All operations shall be conducted only with the permission of, and as directed by, a duly qualified railroad employee present at the site of the work. All costs related to Railroad protection will be passed on to the applicant.

d) Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with and as directed by, CSXT.

4.6 Blasting

a) Blasting will not be permitted under or on CSXT's right-of-way.

4.7 Temporary Track Supports

a) When the jacking, boring or tunneling method of installation is used, and depending upon the size and location of the crossing, temporary track supports shall be installed at the direction of CSXT.

b) The Owner's contractor shall supply the track supports with installation and removal performed by CSXT employees.

c) The Owner shall reimburse CSXT for all costs associated with the installation and removal of the track supports.

4.8 Protection of Drainage Facilities

a) If, in the course of construction, it may be necessary to block a ditch, pipe, or other drainage facility, temporary pipes, ditches, or other drainage facilities shall be installed to maintain adequate drainage, as approved by CSXT. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.

b) Soil erosion methods shall be used to protect railroad ditches and other drainage facilities during construction on and adjacent to CSXT's right-of-way.

4.9 Support of Excavation Adjacent to Track

4.9.1 Launching and Receiving Pits

a) The location and dimensions of all pits or excavations shall be shown on the plans. The distance from centerline of adjacent track to face of pit or excavation shall be clearly labeled. Also, the elevation of the bottom of the pit or excavation must be shown on the profile.

b) The face of all pits shall be located a minimum of 25 feet from centerline of adjacent track, **measured at right angles to track,** unless otherwise approved by CSXT.

c) If the bottom of the pit excavation intersects the theoretical railroad embankment line, interlocking steel sheet piling, driven prior to excavation, must be used to protect the track stability. The use of trench boxes or similar devices is not acceptable in this area

d) Design plans and computations for the pits, sealed by a Licensed Professional Engineer, must be submitted by the Owner at time of application or by the contractor prior to start of construction. If the pit design is to be submitted by the contractor, the project specifications must require the contractor to obtain approval from CSXT's Chief Engineer, Design and Construction prior to beginning any work on or which may affect CSXT property.

e) The sheeting shall be designed to support all lateral forces caused by the earth, railroad and other surcharge loads. See Design Requirements- Design Loads for railroad loading.

f) After construction and backfilling, all sheet piling within 10 feet of centerline track must be cut off 3' – 0" below final grade and left in place.

g) All excavated areas are to be illuminated (flashing warning lights not permitted), fenced, and otherwise protected as directed by CSXT.

4.9.2 Parallel Trenching and Other Excavation

a) When excavation for a pipeline or other structure will be within the theoretical railroad embankment line of an adjacent track, interlocking steel sheet piling will be required to protect the track.

b) The design and construction requirements for this construction shall be in accordance with the requirements of the Construction Requirements – Support of Excavation Adjacent to Track section of this document.

4.9.3 Inspections and Testing

a) For pipelines carrying flammable or hazardous materials, ANSI Codes, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on CSXT property, except as follows:

b) One hundred percent of all field welds shall be inspected by radiographic examinations, and such field welds shall be inspected for 100 percent of the circumference.

c) The proof testing of the strength of carrier pipe shall be in accordance with ANSI requirements.

4.9.4 Reimbursement of CSXT Costs

a) All CSXT costs associated with the pipe installation (inspection, flagging, track work, protection of signal cables, etc.) shall be reimbursed to CSXT by the Owner of the facility. Estimates for Railroad costs will be provided to the Owner prior to the commencement of any work on Railroad right-of-way. **At CSX's option, CSX may require the funds to be paid in advance of any work being done.**

END OF PART 4

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PART 5 – PUBLICATION STANDARDS SOURCES

5.1 Publication Standards Sources

Table 5 – Publication Standards Sources

Organization	Contact Information
ANSI	American National Standards Institute 1899 L Street, NW, 11th Floor Washington, DC 20036 Tel: 202-293-8020
AREMA	The American Railway Engineering and Maintenance-of-Way Association 4501 Forbes Blvd., Suite 130 Lanham, MD 20706 Tel: 301-459-3200
ASTM	American Society for Testing and Materials PO Box C700 West Conshohocken, PA 19428-2959 Tel: 877-909-2786
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235 Tel: 1-800-926-7337
NACE	Then National Association of Corrosion Engineers Houston, TX USA 1-800-797-6223

a) NOTE: If other than AREMA, ASTM, or AWWA specifications are referred to for design, materials, or workmanship on the plans and specifications for the work, then copies of the applicable sections of such other specifications referred to shall accompany the plans and specification for the work.

END OF PART 5

SECTION 02141

TEMPORARY BYPASS PUMPING

PART 1 GENERAL

1.1 SUMMARY

A. This Section shall include furnishing of all labor, materials, power, equipment, and maintenance necessary to implement a temporary pumping system for the purpose of responsibly diverting existing flow around areas of Work for the duration of the project as indicated in the Contract Documents.

B. The Contractor shall not allow the sewage depths in the local system to increase to levels that create the risk of basement back-ups or wastewater spills to the environment.

C. The use of temporary bypass pumping is to be conducted on “As Needed” basis.

D. The design, installation, operation, and impacts of the temporary pumping system shall be the Contractor's responsibility.

E. Compliance to EGLE’s Part 41 permit requires a detailed description of the bypass pumping and/or flow control plan that will be used during the project shall be submitted for EGLE review and approval prior to implementation.

F. Appendix C provides historic meter flow data. Information provided in Appendix C is for reference and does not necessarily include all possible range of flows that could occur during rain events. The Contractor is responsible for providing adequate bypass pumping and/or flow control at all locations for any condition encountered during construction of the rehabilitation Work. The Contractor shall perform the work such that the flow in the existing sewers is not hindered at any time in a manner that could cause sewage levels in the local system to increase to levels that create the risk of basement back-ups, or wastewater spills to the environment.

G. Related Requirements:
1. Section 02704 – Internal Sewer Inspection
2. Section 02708 – Full Length Cured-in-Place Pipe (FCIPP)
3. Section 02709 – Sectional Length Cured-in-Place Pipe (SCIPP)
4. Section 02751 – Cleaning of Sewer Lines
5. Section 02765 – Chemical Grout Pressure Injection

1.2 MEASUREMENT AND PAYMENT

A. All costs including supervision, monitoring, labor, materials, equipment, piping, valving, plugging, utility coordination, sound management, barricading, odor control, and any applicable electrical service necessary to successfully complete the by-pass pumping operations for the duration necessary to complete Work that cannot be completed under normal operating conditions and

restoring the existing appurtenances used during operations to their existing condition shall be considered included in the cost of the project.

B. All costs to reconstruct suction and discharge structures impacted by Bypass Pumping operations are to be included in the cost of the project.

C. Reductions to final pay amounts can be made for non-conforming work and installations below minimum bypass pumping requirements as detailed herein.

1.3 REFERENCES

A. Abbreviations and Acronyms
   1. CIPP – Cured-in-Place Pipe.
   2. EGLE – Michigan Department of Environment, Great Lakes, and Energy.
   3. MDOT – Michigan Department of Transportation.

B. Where referenced, “MDOT Specifications” is a general term that shall include the current version of the MDOT Standard Specifications for Construction and all Supplemental Specifications, Special Provisions, and Errata existing at the time of the award of the Contract.

C. MDOT manuals that are referenced specifically by name shall be the current versions of said manuals existing at the time of the award of the Contract.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Bypass Pumping Provisions
   1. Any work requiring temporary bypass pumping will be determined by the Contractor.
   2. The design, installation, operation, and impacts of the temporary pumping system shall be the Contractor's responsibility.
   3. Temporary sewer plugs will be removed at the end of each working day to reestablish normal gravity flow conditions.
   4. The Contractor shall perform the temporary bypass pumping/flow control work such that the flow in the existing sewers is not hindered at any time in a manner that could cause sewage levels in the local system to increase to levels that create the risk of basement back-ups, or wastewater spills to the environment.

B. A detailed description of the bypass pumping and/or flow control plan that will be used during the project, with supporting calculations, shall be submitted via the permit schedule in MiEnviro for EGLE review and approval prior to implementation. Bypass pumping and/or flow control measures may not begin until EGLE has approved the plan, which may take up to **four (4) weeks**. An email notification shall be made to the Warren District Supervisor within one (1) week of the submission.

C. Electrical Power
   1. Provide adequate stand-alone power supply for the operation of the bypass pumping system, including but not limited to:
      a. Potential maximum flow pumping scenarios.
      b. Monitoring equipment.
   2. Procure proper permitting for any private utility drops.

D. Sound Management
   1. Limit noise levels to 55 dBA a distance of 25 feet from the bypass pumping operation or a maximum of 10 dBA above ambient noise levels, whichever is less.
   2. Utilize sound attenuation of power generation equipment in residential areas.
   3. Remove sound management from project site upon completion of bypass pumping operations.

E. Temporary Odor Control
   1. Prevent the release of objectionable odors related to the bypass pumping operations.
   2. Utilize active odor control measures to control the release of odors during bypass pumping operations.

F. Access Management
   1. Provide an enclosure for each suction and discharge structure being utilized for bypass pumping operations for protection of the public.
   2. Seal enclosures to help control odors.

G. Site Lighting
   1. Provide adequate site lighting for proper flow management and maintenance.
   2. Remove site lighting from project site upon completion of bypass pumping operations.

H. Bypass Pump Monitoring
   1. Provide a dedicated monitoring system on-site for each bypass pumping system whenever the bypass pumping system is in operation to monitor conditions and performance.
   2. Provide a dedicated operator to be on-site for the bypass pumping systems whenever the bypass pumping system is in operation to monitor conditions and performance, ensure proper operation, and facilitate removal of any sewer plugs and restoration of gravity flow as conditions dictate.
   3. Operators shall be properly trained, experienced, and mechanically qualified such that they can quickly and effectively address any potential emergency and non-emergency situations associated with the pumps and bypass pumping system that must remain in operation for an extended period.

I. Coordination
   1. All temporary bypass pumping operations shall commence only upon approval of the Owner. Consistent contact leading up to switch over to temporary bypass is expected.
   2. Work efficiently to limit work period and minimize bypass pumping/flow control duration.

J. Restore all property in the Project Work Area to a condition equal to or better than existing following completion of construction.

K. Bypass pumping operations are prohibited to begin until final acceptance of the required shop drawings and Project Work Plan per Sections 02708 and 02709 which include a bypass pumping plan.

1.5 SPARE PARTS

A. Provide spare parts to be available should the operation of the bypass pumping system fail or be interrupted, to be retained by the Contractor or rental company, including but not limited to:

1. One (1) backup Pump minimum
2. Spare hose clamps
3. Spare suction and discharge piping
4. Sewer Plugs of varying sizes
5. Valves (where required)
6. Power Generators (where required)
7. Fuel (supply up to 24 hours of operation)

1.6 SUBMITTALS

A. Name and qualifications of the Contractor who will be performing the bypass pumping operations.
   1. Submit with bid.
   2. Will be used to evaluate the qualifications of the bidder.

B. Prepare a Bypass Pumping/Flow Control Plan in advance of the pre-construction meeting which clearly defines the flow diversion plan to comply with the requirements of the Contract Documents. The Bypass Pumping/Flow Control Plan shall at minimum contain:
   1. Bypass pumping/flow control operational narrative.
   2. Staging area for pumps.
   3. Pipe plugging method and types of plugs.
   4. Size and location of manholes or access points for suction and discharge hose or piping.
   5. Contractor verified size of pipeline or conveyance system to be bypassed.
   6. Number, size, material, location and method of installation of suction piping.
   7. Number, size, material, location and method of installation of discharge piping.
   8. Bypass pump sizes, capacities, and number of each size to be provided onsite including all primary, secondary, and spare pumping units.
   9. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump, operating range shall be submitted).
   10. Downstream discharge plan.
   11. Method of protecting suction and discharge manholes or structures from the public, erosion, and damage.
   12. Thrust and restraint block sizes and locations. Provide the details necessary to demonstrate the integrity of all suction and discharge piping including piping and fittings associated with all primary and secondary pumping units.
   13. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.
   14. Method of sound management for each pump and any additional equipment that is included in the Bypass Pumping/Flow Control Plan.
   15. Any temporary pipe supports and anchoring requirements.
   16. Access plans to all bypass pumping/flow control locations indicated on the drawings.
   17. Calculations for selection of bypass pumping pipe size.
   18. Schedule for installation of and maintenance of bypass pumping lines.
   19. Plan indicating location of bypass pumping pipe locations.
   20. Contractors plan for providing continuous monitoring of the bypass pumping operation as well as the monitoring persons' qualifications.
   21. Emergency plan for adverse weather and flooding for various phases of the Work, including an emergency contact list of monitoring personnel.
   22. Method to maintain traffic around bypass pumping/flow control operations.

23. Method to control potential odors created by bypass pumping/flow control operations.

C. The bypass pumping/flow control plan that will be used during the project, with supporting calculations, shall be submitted via the permit schedule in MiEnviro for EGLE review and approval prior to implementation. Bypass pumping and/or flow control measures may not begin until EGLE has approved the plan, which may take up to **four (4) weeks**.

D. Calculations that support bypassing to cover the range of flows as listed in Appendix C. Note these are supplementary and are only for providing estimated conservative ranges of flow. Detailed calculations and plans is the Contractor's responsibility.

1.7 QUALITY ASSURANCE

A. Monitoring
1. Contractor responsible for continuously monitoring bypass pumping operations for 24 hours per day, 7 days per week.
   a. Monitoring personnel shall be properly trained, experienced, and mechanically qualified such that they can quickly and effectively address any potential emergency and non-emergency situations associated with the pumps and bypass pumping system that must remain in operation for an extended period.
   b. Monitoring personnel shall not work longer than a 12-hour shift.
   c. Monitoring personnel to maintain cell service 24 hours a day.
2. Contractor responsible for operation and maintenance of pumps and discharge piping, conduits, fittings and all other equipment needed to properly bypass pump.
   a. Fuel delivery services, mechanics, and spare parts must be within two hours of project site.
3. Provide list of personnel with contact telephone numbers, work classification, duties, and anticipated response times for emergency conditions.
   a. Contact list to be reviewed by Owner.
   b. Reasonable response time for correction of emergency conditions is required.
4. Provide an electronic level monitoring enclosure.
   a. Install enclosure above grade and readily visible.
   b. Provide a minimum of five (5) distinct level indications displayed by lights mounted on the face of the monitoring enclosure panel.
   c. It is the Contractor's responsibility to determine surcharge level indicators for the pumping operation.
      1) Submit level indicator levels to Owner for reference.
   d. Provide separate adjustable float level switches for each level indicator.
   e. The first light shall be lit at the normal dry weather flow level.
   f. The fourth and fifth indicating lights shall be in common with a flashing red alarm beacon and horn mounted on the enclosure.
   g. Set higher level indicators at elevations determined for each installation.
   h. Power this monitor by a stand-alone power supply unless otherwise authorized.
   i. Separate this monitor from the controls furnished to operate the bypass pumps
5. Provide record of surcharge level elevation checks at upstream manhole(s) logged at two (2) hour intervals during bypass pumping.

6. Contractor is responsible for all damage incurred by or associated with sewer backups due to surcharge levels caused by bypass pumping operations.

B. Redundancy Requirements
1. Provide redundant pumping capacities for dry weather flows.
2. Permanent backup pumping capacity is not required for wet weather peak flow capacities.
a. Prior to beginning bypass pumping operations, provisions shall be made for obtaining an adequate size stand-by pump capable of handling the wet weather peak flows.
b. Stand-by pump is required to be available within a reasonable distance so as to not surcharge the system beyond the level indicators provided.

1.8 QUALITY CONTROL

A. Contractor is responsible for surcharge levels in the sanitary system upstream of the by-pass pumping/flow control operations and therefore responsible for any damage incurred by or associated with sewer backups as a result of these operations.

B. It shall be the responsibility of the Contractor to correct or suspend operations, if necessary, when the Work is not in compliance with these specifications.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. All equipment and materials shall be of good quality or new and in good working order to the satisfaction of the Owner.

B. It is the responsibility of the Contractor to provide all equipment necessary to properly maintain flow throughout the project.

2.2 PUMPS AND PIPING

A. Determine pump selection and pipe sizing based on expected maximum of incoming flows unless otherwise indicated.
1. It is the Contractor's responsibility to adequately size the pump(s) and piping for bypass pumping operations.
2. At minimum, pumps shall be sized to handle the flowing full capacities of all incoming pipes in closed conduit systems unless site specific flow data is provided by the Owner.
3. Flow data, if provided, is the best information available and no guarantee is made or should be assumed as its completeness or accuracy.

B. Dry Weather Flow pumps shall be capable of handling solids sizes of up to 3-inches.

C. Pumps shall be designed to operate within the existing manhole structures, and have an operating range of several inches of flow up to one foot above the crown of the lowest effluent pipe at the manhole structure.

D. All pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flows.

E. Permanent backup pumping capacity is required for dry weather flow rates.

PART 3 EXECUTION

3.1 EXAMINATIONS

A. Review project site to verify discharge piping locations in conformance with the Bypass Pumping\Flow Control Plan.

B. Any discrepancies between the site plan and piping configuration developed as part of the Bypass Pumping\Flow Control Plan and actual site conditions shall be brought to the attention of the Owner prior to mobilizing bypass pumping equipment to site.

3.2 PREPARATION

A. No construction shall begin until the Project Work Plan (per Sections 02708 and 02709 which includes a bypass pumping plan) has been reviewed and approved by the Owner.

B. Setup necessary traffic control prior to installation of bypass pumping\flow control equipment and materials.

C. The Contractor is to furnish all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing flow around the Work Area for the duration of the project.

D. Ensure all equipment and materials necessary for the operation of the temporary bypass pumping are on-site prior to any demolition or removals necessary to assemble the system.

E. The Contractor shall notify the Owner and Engineer three (3) working days prior to the start of any temporary bypass pumping/flow control activities.

3.3 INSTALLATION

A. Pumps and Discharge Piping

22. Contractor is responsible for any damage to manholes.
    a. It may be necessary to remove the manhole cone and intermediate platforms to provide sufficient space for the pumps and bypass piping.
    a. If this is required, the Contractor shall be responsible for any damage or modification to existing manhole components.
23. Discharge piping to gravity sewer systems shall be designed in such a manner as to prevent discharge from contacting manhole walls or benching and full discharge shall go into the effluent pipe with as minimal turbulence as possible.
    b. Secure discharge piping to prevent movement during pumping operations.
    c. Extend discharge piping a minimum of five (5) feet into the effluent pipe of the discharge manhole

B. Leakage Testing
   1. Perform leakage and pressure testing of the bypass pumping discharge piping using potable water prior to actual operation.
   2. Conduct testing at one-and-a-half times the maximum pressure the system will experience for a period of two hours.
   3. No leakage is permitted during the test.
   4. Provide 24 hours' notice prior to testing

3.4 APPLICATION

A. Rehabilitation work involving CIPP lining and/or chemical joint grouting is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.
   1. In the event a rain event occurs during rehabilitation work, The Contractor shall have bypass pumping equipment on site to facilitate wet weather flows.

B. The Contractor is solely responsible for the safety of personnel, vehicles, equipment, material, and tools used by the Contractor to perform the bypass pumping work.

C. Clean debris that collects on equipment regularly and properly dispose of such debris material.

D. The Contractor shall not allow the sewage depths in the local system to increase to levels that create the risk of basement back-ups or wastewater spills to the environment.

E. Should maximum surcharge levels be exceeded – defined as wastewater levels rising more than 1 foot above the crown of the lowest connected pipe – the Contractor shall cease work and restore gravity flow through the removal of any temporary sewer plugs.
   1. Suspension of temporary bypass pumping and restoration of gravity flow due to interruption or failure in the bypass pumping system and/or operations (including power failure w/o required backup) shall be at no additional cost to the Owner.
   2. Contractor shall bear all responsibility for any required additional cleaning efforts and any loss of work product and/or materials.

F. The Contractor shall cease bypass pumping operations and return flows to the new and/or existing sewer when directed by the Owner.

G. Contractor is obligated to comply with the monitoring plan submitted and shall observe the level indicators provided for each bypass pumping operation.

H. Sewage Spills
   1. During bypassing, no wastewater shall be leaked, dumped, or spilled in or onto any area outside the existing wastewater system.
   2. In the event that raw sewage is spilled, discharged, leaked or otherwise deposited in the open environment due to the Contractor's work, the Contractor is responsible for any cleanup of solids and disinfection of the area affected and liability for any claims at the Contractor's expense.
   3. Contractor is responsible for notifying sewer system maintenance personnel and complying with all regulatory requirements in regards to the extent of the spill.

3.5 FINISHING

A. When plugging or blocking of the sewers is no longer needed for performance and acceptance of the Work, all plugs shall be removed in a manner that allows sewage flow to slowly and safely return to normal levels without causing surcharging or other significant downstream disturbances.

B. When bypass operations are complete, all bypass piping shall be flushed with potable water and drained into the wastewater system prior to disassembly.

C. All bypass pumping equipment and materials shall be removed from the sewer system upon completion of bypass pumping operations.

D. Restore bypass pump areas to pre-bypass condition including any cleanup measures necessary due to fuel, oil or sewage leaks. All cleanup measures taken shall be documented.

E. The Contractor shall be required to repair, at his own expense, any damage to public or private property caused by his operations.

F. Should damage of any kind occur to the existing sewers, the Contractor shall, at his own expense make repairs to the satisfaction of the Owner.

END OF SECTION

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SECTION 02708

FULL LENGTH CURED-IN-PLACE PIPE (FCIPP)

PART 1 GENERAL:

1.1 SUMMARY

A. This Section shall include all work, materials, labor, and equipment necessary to provide for rehabilitating gravity flow sewer pipelines by the installation of a resin-impregnated flexible tube that will cure into a hard impermeable full length cured-in-place pipe (FCIPP) that shall extend from end to end in a continuous, tight-fitting, watertight pipe-within-a-pipe.

B. Related Requirements
1. Section 02030 – Sequence of Construction and Special Project Requirements
2. Section 02141 – Temporary Bypass Pumping
3. Section 02704 – Internal Sewer Inspection
4. Section 02751 – Cleaning of Sewer Lines

1.2 MEASUREMENT AND PAYMENT

A. Sewer, Cured-In-Place Pipe Lining(__")……Lft
Sewer Lining shall be paid for at the Contract bid price per linear foot for actual linear footage of cured-in-place pipe installed in the field, complete in place, for the size of pipe installed. Measurement shall be from center of structure to center of structure. Payment for the cured-in-place pipe shall also include the cost of sealing the pipe in the manholes, reworking the manhole inverts and benches, and all required testing.

B. The following work items shall be included in the Contract bid price per linear foot for **Sewer, Cured-In-Place Pipe Lining(__"),** unless otherwise described
1. Identification of existing live taps
2. Styrene Odor Control Plan
3. Bypassing of flow
4. Air Testing (sampling and measuring of styrene odors)
5. Removal of line obstructions
6. Proper disposal of cure water
7. Reinstating lateral connections
8. Sampling and testing of cured-in-place pipe
9. Post installation T.V. inspection with PACP reporting
10. Clean-up
11. Site Restoration
12. All additional items described herein as incidental to the Work

C. Any additives, resin modifications, installation methods, or other changes in Work necessary to reduce styrene odors shall be indicated in the Styrene Odor Control Plan and shall be included in the Contract bid price per linear foot for **Sewer, Cured-In-Place Pipe Lining(__")**.

1.3 REFERENCES

A. Abbreviations and Acronyms

1. BABA – Build America Buy America
2. CIPP – Cured-in-Place Pipe
3. FCIPP – Full Lenth Cured-in-Place Pipe
4. ITCP – Inspector Training Certification Program
5. PACP – Pipeline Assessment and Certification Program (most current version)
6. RIFI – Resin-Impregnated Fabric Inversion Liner

B. Reference Standards
1. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
2. ASTM D 5813 – Standard Specification for Cured-in-Place Thermosetting Resin Sewer Piping Systems
3. ASTM F 1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
4. ASTM F 1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe
5. ASTM F 2019 – 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)
6. ASTM F 2994 – Standard Practice for Utilization of Mobile, Automated Cured-In-Place Pipe (CIPP) Impregnation Systems
7. All Work shall comply with the reference standards unless specifically stated otherwise in the Specification
8. References to standards which are made part hereof shall be latest edition thereof

1.4 ADMINISTRATIVE REQUIREMENTS

A. Access
1. Determine locations of appropriate access points (manholes) for cured-in-place pipe installation.
2. Obtain access rights from private property owners when access across private property is necessary to reach access manholes due to easement congestion which limits equipment travel within existing easements, unless provided by Owner.

B. Coordination
1. Provide adequate notification of Work to private property owners that are connected to the sewer being lined whose building laterals will be out of service during the cured-in-place pipe installation, curing, and restoration processes.
2. Notification shall;
   a. Be in writing via door hanger, door flier, or U.S. Mail given 24 hours but no more than 48 hours in advance of service loss (excluding weekends and holidays)
   b. Clearly state purpose of the Work.
   c. Advise all affected customers against water usage until the sewer line is placed back in service.
   d. Clearly state the potential consequences of using wastewater generating facilities during the time the building sewer service will be out of service.
   e. Include a 24-hour contact telephone number for questions regarding the Work.
3. Limit service outage for any property served by the sewer to no more than 24 hours.

C. Prepare a Styrene Odor Control Plan to minimize project specific styrene odors at the project site and surrounding areas.

1. Submit with Bid Proposal.
2. Styrene odor control plan will be used to evaluate the qualifications of the bidder.

D. Collect and dispose of cure water to an Owner approved location when lining sewers that discharge to open waterways.

E. Restore all property in the project work area to a condition equal to or better than existing following completion of construction.

F. Final acceptance of each line segment is contingent on completion and acceptance of sample testing and receipt and approval of post-installation T.V. inspection.

1.5 PROJECT WORK PLAN

A. Prepare a Project Work Plan (PWP) in advance of the pre-construction meeting which clearly defines the CIPP product delivery in conformance with the requirements of the Contract Documents. The PWP shall at minimum contain:
1. Detailed installation plan describing all work necessary and appropriate for a complete CIPP installation.
2. Installation method, sequencing and schedule.
3. Schedule of Submittals.
4. Bypass pumping plan.
5. Traffic control plan.
6. Odor control plan.
7. Engineering design calculations to for each length of cured-in-place pipe to be installed including the thickness of each proposed CIPP.
8. Detailed public notification plan.
9. Project contact list and defined responsibilities.
10. Proposed procedures for product sampling and testing.
11. Sample field documentation forms, reports, and logs.
12. Outline of specific repair or replacement procedures for potential defects that may occur in the installed CIPP.

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

1.6 SUBMITTALS

A. CIPP Liner Design
1. Provide preliminary design of CIPP liner with bid
2. Provide secondary design of CIPP liner if necessary after pre-lining inspection
3. Furnish certified design calculations stamped by a registered professional engineer prior to liner manufacture

B. Liner Tube data
1. Manufacturer
2. Description of product components
3. Technical data sheets
4. Certified information from manufacturer of the liner tube's nominal void volume

C. Liner Tube Coating

1. Material safety data sheets (MSDS)
2. Technical data sheets
3. Recommended repair (patching) procedure, if applicable
4. Design thickness

D. Raw Resin data
1. Manufacturers of all formulated resin components: resin, catalysts, fillers, additives, and monomers
2. Description and percentage utilization of each component for the resin formulation proposed.
3. Technical data sheets for all formulated resin components
4. MSDS for all formulated resin components

E. Site Samples
1. Provide flexural and tensile testing reports of CIPP samples from the last three (3) projects in which testing was completed
2. Provide copies of design thickness calculations for the cured-in-place pipe from the flexural and tensile testing reports

F. Manufacturers' shipping, storage and handling recommendations for all components of the CIPP system.

G. Proposed tube wet-out and cure method, including:
1. A complete description of the proposed wet-out procedure for the proposed technology
2. When epoxy resins are utilized, manufacturer's certification of compliance with ASTM F2994
3. CIPP manufacturer's recommended installation and cure method - for each diameter and thickness of the CIPP to be installed

H. Licensed Testing Company to perform third-party flexural properties testing on representative samples collected from the installed CIPP.

I. Personnel Certifications
1. Documentation of PACP certified personnel assigned to pre- and post-inspection televising of pipelines
2. Documentation of ITCP certified personnel assigned to project

J. Styrene Odor Control Plan
1. Method to continually monitor styrene resin odors in the project area during the liner installation, inversion, and curing process
2. Method to contain styrene resin odors from the liner container truck
3. Method to contain styrene odors during CIPP liner installation and curing
4. Method to contain styrene resin odors from inversion water discharging after CIPP curing completion
5. Name of the equipment for sampling and measuring styrene odors
6. Sample Resident Notification Letter, addressing the issue of styrene odors and providing educational information on how to avoid the odors and what to do if the odors are present in a home/business/school
7. Procedures for notifying schools, hospitals, and businesses impacted
8. Procedures for work progress should maximum permissible styrene odor levels be exceeded

1.7 QUALITY ASSURANCE

A. The Contractor shall carry out his operations in strict accordance with all Occupational Safety and Health Administration (OSHA) and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

B. Products used in the Work identified herein shall be produced by manufacturers regularly engaged in the manufacture of cured-in-place liners for municipal water systems and with a history of successful production acceptable to the Owner.

C. Verification of Pipeline Inside Diameter
1. Prior to manufacture of the CIPP, the Contractor is responsible for verifying the inside diameter of the pipeline to be rehabilitated to assure a tight-fitting cured-in-place pipe is installed.
2. Sections of liner with visual defects, continuous or intermittent inward folding, or overlapping of excess liner material will be rejected, refer to "Section 3.13 – Non-Conforming Work" for acceptance criteria.

D. Styrene Odor Control Monitoring
1. Read and record styrene levels every one (1) hour with a Drager Tube or approved equal.
2. Measure styrene levels a maximum of 10 feet away from the inversion manhole while liner is being inverted and cured.
3. Notify Owner and implement procedures for work progress should styrene level readings exceed 50 parts per million (ppm) or resident complaints of excessive styrene odors are filed.

E. Minimum Qualifications
1. The installing Contractor shall be licensed by the CIPP lining system Manufacturer and shall have successful experience in the installation of CIPP lining systems in municipal wastewater systems.
   a. Provide a copy of the license/agreement or letter from the CIPP Manufacturer that certifies the use and installation of the CIPP lining system by the Contractor.
   b. The Contractor shall be familiar with the specified requirements and methods needed for proper performance of the liner system in accordance with the Work specified herein.
2. Contractor's Field Supervisor Foreman: Minimum five (5) years of continuous experience as a foreman/superintendent for a CIPP installation crew
3. Minimum CIPP installations of the proposed method by the Contractor in the past five (5) years:

Pipe Diameter Range	**Required Performance (inch-miles)**
Up to 18-inch	1,000
18-inch to 36-inch*	200
36-inch and larger*	50

* if in Contract

4. All CCTV work shall be performed under the supervision of personnel trained and certified in the use of NASSCO's PACP for the inspection of sewer mains.

PART 2 PRODUCTS:

2.1 CIPP MATERIALS

A. The Build America, Buy America Act (BABA), a part of the Infrastructure Investment and Jobs Act (Public Law 117-58), requires that recipients of U.S. Environmental Protection Agency (EPA) Congressionally Directed Spending (CDS) Grant use products that are produced in the United States for infrastructure projects, including construction, alteration, maintenance, or repair.
   1. Refer to Section 00853 for all requirements and standards with which the Contractor must comply with related to the BABA.

B. Liner tube
   1. Shall consist of one or more layers of flexible needled felt or an equivalent absorbent non-woven or woven felt fabric, felt/fiberglass or fiberglass that when installed will tightly fit the internal circumference of the existing conduit.
   2. Meet the requirements of ASTM F1216, ASTM F1743, ASTM D5813, ASTM F2019 or ASTM F2994 whichever is compatible with the CIPP system proposed.
   3. Capable of absorbing and carrying resins
   4. Constructed to withstand installation pressures and curing temperatures
   5. Have sufficient strength to bridge missing pipe segments
   6. Have the ability to stretch to fit irregular pipe sections, negotiate minor bends, and dimple at any service or branch connection.
   7. Uniform in thickness and, when subjected to installation pressures, will meet or exceed the designed finish wall thickness in accordance with ASTM F1216, Section 8.6.
   8. Mark liner tube for distance at regular intervals along its length, not to exceed 5 feet, and include the CIPP Manufacturers name or identifying symbol (brand).

C. Thermosetting Resin System
   1. Corrosion resistant unsaturated, isophthalic polyester or vinyl ester thermoset resin and catalyst system or epoxy resin and hardener that is compatible to the installation process and when properly cured within the tube composite meets the requirements of ASTM F 1216, ASTM F 1743 or ASTM F 2019, the physical properties herein, and those, which are to be utilized in the design of the CIPP for this project.
   2. The resin shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.
   3. Formulate the resin system for the subject project;
      a. Viscosity shall be conducive to its being saturated into the void space of the tube's matrix,
      b. Thixotropy shall be adjusted to minimize its migration during the tube installation process.
   4. The pot life of the catalyzed resin system should be such that it provides a reasonable timeframe for the tube to be installed.
   5. If necessary, add a dye (pigment), approved by the CIPP manufacturer, to the catalyst or resin to allow visual verification that the liner tube has been thoroughly wet-out.
   6. Resins that are expired are not permissible; ensure the resin system to be used is within the resin manufacturer's recommended shelf life.

D. Corrosion Resistance
   1. Furnish a corrosion resistant, unsaturated, isophthalic polyester or vinyl ester thermoset resin and catalyst system, or epoxy and hardener compatible with the process that provides cured physical strengths specified herein.

2. The installed CIPP shall have a long term (50 years) corrosion resistance to typical chemicals found in domestic sewage.

E. Chemical Resistance
1. Provide in accordance with the requirements of ASTM F1216, Appendix X2.
a. Testing for chemical resistance shall be at the Owner's request.
b. Costs for chemical resistance testing to be borne by the Owner.
2. The pipe within-a-pipe, when cured, shall be chemically resistant to withstand internal exposure to sewage gases containing hydrogen sulfide, carbon monoxide and dioxide, methane gas, dilute sulfuric acid, and external exposure to soil bacteria and chemical attack which may be due to materials in the surrounding ground or sewage within.
3. The finished CIPP shall be fabricated from materials which, when cured, will be chemically resistant to withstand internal exposure to domestic sewage.

F. The color of the interior liner surface shall be light reflective and pre-approved by the Owner, to allow for adequate post installation inspection by closed circuit television.

G. Styrene Chemicals
1. Use minimal styrene chemicals for the CIPP resin to minimize styrene odors in residential homes and business office.
2. The maximum level of released styrene shall not exceed 50 ppm.

2.2 PHYSICAL STRENGTH

A. The CIPP system shall conform to the minimum initial structural standards, as listed below.

	Standard	Minimum Required
Flexural Strength	ASTM D 790	4,500 psi
Flexural Modulus of Elasticity	ASTM D 790	250,000 psi

Note: Samples from the project shall be taken and tested in accordance with Section 8 of ASTM F 1216 using either method. See Section 3.10, "Field Quality Control" of this Specification.

2.3 DESIGN

A. Provide measurement verification of the inside diameter of each pipeline to be rehabilitated signed by the installer of the CIPP with the design calculations.

B. Design CIPP wall thickness in accordance with Appendix X1, of ASTM F 1216 using the **fully deteriorated** pipe condition.

C. Design for a minimum fifty (50) year service life under continuous loading conditions.

D. Design such that the net inside diameter of the rehabilitated sewer is as large and smooth as possible.

E. Furnish design calculations **for each run of pipe to be lined** (i.e. manhole to manhole) based on site-specific parameters (diameter, depth, ovality, etc.) and soil modulus and groundwater table levels to be reviewed by the Engineer.
1. All calculations shall be signed and sealed by a Registered Professional Engineer.

2. Multiple runs of the same diameter pipe may be included under a single design calculation if the remaining site-specific parameters do not exceed the parameters assumed in the calculation.
    a. Include site-specific parameters of each run included in the single design calculation.

F. Minimum CIPP liner thickness, unless otherwise specified, shall be determined utilizing design procedures outlined in ASTM F1216, Appendix X1, mechanical properties provided by the CIPP Manufacturer, and the following project specific design assumptions:

1. Existing sewer is fully deteriorated
2. Existing sewer is considered to have 2% ovality in circumference
3. CIPP is subjected to a full soil load of 120 lbs/cft
4. CIPP is subjected to traffic loads as calculated by AASHTO HS-20-44 Highway Loading over a flexible pavement
5. Backfill material over pipe is classified as Class II with a modulus of soil reaction for pipe zone of 700 psi
6. CIPP is subject to groundwater elevation five (5) feet below ground surface.

G. Sanitary sewers crossing beneath railroads is to be considered for this project.
1. CIPP installations for railroad crossings shall be designed in accordance with ASTM F 1216, Appendix X1.
2. CIPP designed will not be accepted when the wall thickness of the CIPP liner is greater than 2 inches.
3. Railroad live loads shall be designed using Cooper E-80 Loading. Railroad load requirements are also provided in Section 3.2.3 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).
4. Refer to Section 2.4, 3.2, and 3.16 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).

H. Submit price proposal for the length and size of pipeline specified assuming the finished liner is continuous over the entire length of the liner insertion run between manholes.

I. Should pre-lining inspection reveal the sewers to be in substantially different conditions than those in the design considerations, the Contractor shall submit a “secondary design” to request such changes in CIPP wall thickness, supporting such request with revised design computations signed and sealed by a Registered Professional Engineer.
1. Submit secondary design only upon authorization from the Owner.
2. Determine costs to perform a secondary design and install a liner that differs from what was proposed during the bidding process in accordance with the contracting requirements of the Owner, prior to completing the Work.

PART 3 EXECUTION:

3.1 PRE-INSTALLATION

A. The following procedures shall be adhered to unless otherwise approved by the Owner's representative.

B. Rehabilitation work involving CIPP lining is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.
   1. In the event a rain event occurs during rehabilitation work, The Contractor shall have bypass pumping equipment on site to facilitate wet weather flows.

C. Pre-Installation Cleaning of Sewer Lines
   1. Remove all internal debris out of the sewer line that would prevent proper installation of the CIPP.
   2. Refer to Section 02751 for the minimum requirements for cleaning of sewer lines

D. Pre-Installation Inspection of Sewer Lines
   1. Inspect pipeline to determine the location of any conditions which may prevent proper installation of the fabric lining into the pipelines, and it shall be noted so that these conditions can be corrected.
   2. Refer to Section 02704 for the minimum requirements for inspection of pipelines

E. Locate Service Connections
   1. Record location of all service connections.
   2. Determine capped and unused services with Owner.
   3. Establish service connections to reinstate
      a. All service connections are to be reinstated unless otherwise directed by the Owner.
      b. Coordinate with the Owner any service connections that are not to be reconnected.
      c. Record plan for all service connections
   4. Refer to sample Service Connection Documentation Form that follows this Section.

F. Bypassing Sewage
   1. If the Contractor deems it is necessary to bypass pump the flow in the sewer being rehabilitated, the Engineer and Owner must approve of the bypass pumping.
   2. Provide for the bypass pumping of sewage around the section or sections of pipe being installed.
      a. Bypass shall be made by plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or alternate system.
      b. The pump and bypass lines shall be of adequate capacity and size to handle all the anticipated flow.
      c. If pumping into alternate system, review system capacity to determine if it has adequate capacity to handle the additional flow.
   3. The Contractor shall take adequate precautions to assure that no backup of sewage into basement drains occurs during installation.
      a. Monitoring of the surcharge levels during pumping operations is required 24 hours per day, 7 days per week.
      b. The Contractor shall be fully responsible for any damages resulting from his operation.
   4. The Contractor shall distribute door hangars to the affected residents 24- to 48-hours prior to rehabilitation Work.
   5. Refer to Section 02141 – Temporary Bypass Pumping for measurement details.
      a. Refer to Appendix C for supplementary flow range data.
      b. This data is to provide conservative maximum values and may not accurately represent flows within specific pipes.

6. All costs associated for the bypass pumping of sewage around the section or sections of CIPP being installed shall be included in the unit price bid for "**Sewer, Cured-In-Place Pipe Lining(__")"** unless separate pay items are included in the Proposal for the Work described.

G. Line Obstructions
1. Clear line obstructions such as solids, protruding service connections or collapsed pipe that will compromise the proper installation of the CIPP lining.
2. Remove service leads excessively protruding into the pipe more than 5% of the pipe's internal diameter.
   a. Use a remote saw cutter or similar method, subject to the approval of the Engineer.
   b. Refer to Section 02751 for the minimum requirements for cutting protruding service leads.
3. If inspection reveals an obstruction that cannot be removed by remote internal type equipment, then the Contractor shall notify the Owner.

H. Infiltration Control
1. Contractor shall evaluate amount of infiltration that is occurring at the time of the work, and determine the approach needed for control of any infiltration that may be present to ensure a successful CIPP liner installation. The Contractor must demonstrate their rationale that supports use (or non-use) of infiltration control measures.
2. Pay item is included in the Contract for joint grouting to provide compensation where this measure is necessary for a successful CIPP liner installation.
3. Installation of a pre-liner where necessary is to be incidental to the pay item for CIPP lining.

I. Owner's Review of Pre-Lining CCTV Videos
1. Submit pre-installation inspection videos and reports of sewers to be lined a minimum one (1) week prior to planned lining.
2. No sewers are to be lined until the Owner has authorized the Contractor to proceed with the CIPP installation.

J. Contractor's Review of Pre-Lining CCTV Videos
1. Review the pre-installation inspection videos and reports of sewers to be lined.
2. Determine if the condition of the host pipe is acceptable to receive the CIPP installation.
3. Submit a "secondary design" should the pre-installation inspection reveal the sewers to be in substantially different conditions than those in the design considerations
4. Install pre-liner, per manufacturer's recommendation, where the host pipe material is not compatible with the proposed CIPP product; include this work in "secondary design" submittal.

K. Prior to any lining, the Contractor shall certify that a minimum of two (2) robotic reinstatement cutters (for reconnecting services) are available for use on this project.

3.2 RESIN IMPREGNATION

A. Designate a location where the uncured resin in the original containers and the unimpregnated tube will be vacuum impregnated prior to installation.
1. Impregnation to be performed in a regulated, quality controlled facility in accordance with local ordinances.

2. Allow the Owner to inspect the materials and "wet out" procedure.
3. Utilize a resin and catalyst system compatible with requirement of this method.

B. Document the volume of resin placed in each tube and the volume of resin indicated by the tube's manufacturer for a complete filling of the void space.
1. Call to the attention of the Owner/Engineer any tube failing to accept the full amount of resin per the tube manufacturer's specifications prior to installation to allow for a visual inspection.
2. Tube's failing to accept at least 95% of the prescribed resin amount shall be reviewed by the manufacturer and certified to the Owner/Engineer of its acceptability for use prior to its installation.

C. Prepare a "Wet Out Report" for each liner
1. CIPP systems conforming to ASTM F2994 shall provide wet out reports to the Owner for each installation in digital format.
2. Record wet out quantities on the "Wet Out Report".
3. Submit to the Owner or Owner's representative with each liner delivery.
4. Refer to a sample "Wet Out Report" that follows this Section.

3.3 INSTALLATION OF CIPP (INVERSION METHOD)

A. Pressurized air liner inflation/steam is prohibited in sewers greater than 12 inches in diameter, unless otherwise indicated.

B. Provide manufacturer calculated minimum pressure required to hold the tube tight against the existing conduit and maximum allowable pressure so as to not damage the tube.

C. Install resin-impregnated tube in accordance with ASTM F 1216.
1. Maintain pressures between manufacturer minimum and maximum allowable pressures until the installation is complete.

D. Take suitable precautions to eliminate hazards to personnel in the proximity of the construction when pressurized air is being used.

E. No Pull-in method shall be utilized. The unrolling action of the tube during inversion is necessary to minimize gouging and for stretching and accommodating bends encountered. Also, for non-circular sections the tube inversion will minimize folds and uneven stretching which would result in thinning of the upper portion of the CIPP.

3.4 CURING (NON-U/V APPLICATIONS)

A. Required Curing Parameters (for both steam and heated water)
1. Provide the temperature required to affect a cure of the resin as recommended by the resin manufacturer.
2. Provide manufacturer estimated maximum and minimum pressures required to hold the flexible tube tight against the existing conduit during the curing process.

B. Cure the CIPP in accordance with ASTM F 1216 and ASTM F 1743.
1. Fit the heat source with suitable monitors to gauge the temperature of the incoming and outgoing water supply.

2. Place an additional gauge within the impregnated tube and also at the pipe invert at the remote manhole to determine the in place liner temperature during cure.
3. Comply with recommendations from resin manufacturer for water temperature in the line during the cure period.

C. Prepare a CIPP "Curing Report" for each CIPP installation.
1. Log actual temperature readings at various time increments as noted in the "Curing Report" during the curing process.
2. Submit to the Owner/Engineer upon request.
3. Refer to a sample "Curing Report" that follows this Section.

3.5 CURING (U/V APPLICATIONS)

A. Required Curing Parameters
1. Provide the rate of travel for the ultraviolet curing lights required to allow for cross-linking/polymerization and curing of the CIPP resin as recommended by the system manufacturer.
2. Provide manufacturer estimated maximum and minimum pressures required to hold the flexible tube tight against the existing conduit during the curing process.

B. Cure the CIPP in accordance with ASTM F 2019.

C. Prepare a CIPP "Curing Report" for each CIPP installation.
1. Maintain log of time, rate of travel of the ultraviolet assembly, and pressures maintained during the curing process.
2. Submit to the Owner/Engineer upon request.

3.6 COOL-DOWN

A. Cool the new CIPP in accordance with ASTM F 1216 and ASTM F 1743.

B. Take care in the release of the static head or air pressure so as not to develop a vacuum that could damage the newly installed CIPP.

3.7 SEALING CIPP AT MANHOLES

A. Seal the manhole walls, at all manhole inverts in accordance with CIPP system manufacturer's recommendations.

B. Terminate the CIPP at the manhole by trimming the liner end back within approximately two (2) inches of the outlet. Finish the liner connection with hydraulic cement.

C. Assure completed liner terminations are free of rough edges with smooth transition into the receiving structure.

D. Seal shall be of a resin mixture compatible with the installed liner system.

3.8 SERVICE CONNECTIONS

A. After the cured-in-place pipe has been installed, reconnect existing active house lead connections. This is to be done without excavation and from the interior of the newly installed liner by the use of a remote-controlled cutting device. All active connections shall be satisfactorily opened to the

approximate size and shape of the original opening and shall be smooth and flush wherever there is a chance of debris buildup. If a service connection has been deemed inactive by the Owner , it can be left unopened if approved by the Owner. All opened services shall be finished brushed. No additional payment will be made for excavations for the purpose of reopening service connections and the Contractor will be responsible for all costs associated with such excavation and restoration Work. Any damages occurring from services which are not re- opened shall be incurred solely by the Contractor.

1. Cut a relief hole through the liner at each opening to relieve any water that has accumulated in the leads during the lining process.
2. Complete reconnections without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a cutting device that re-establishes the service connection to 100% of its original capacity.
    a. Remove pipe fragments or liner fragments which may obstruct flow or snag debris.
    b. Correct overcut openings with a repair patch of a resin mixture compatible with the liner system and of sufficient size to completely cover the overcut.
    c. Brush the full circumference of all completed service connections to eliminate rough or jagged edges of the liner.
3. Record status and condition of each service connection.
4. Refer to sample Service Connection Documentation Form that follows this Section.

B. All leads to be reinstated shall be reconnected within 24 hours.
1. No lead shall remain out of service for more than 24 hours.
2. If a lead problem occurs where a lead will remain out of service, the Contractor will provide emergency service at the Contractor's cost.

C. Remove coupons of pipe material resulting from service tap cutting
1. Collect at the next manhole downstream of pipe rehabilitation operation prior to leaving site.
2. Coupons are prohibited from passing through the sewer collection system.

D. All costs associated with reinstating laterals shall be included in unit price bid for each **"Sewer, Cured-In-Place Pipe Lining, (__")"**.

3.9 FINISH

A. The finished cured-in-place pipe shall be continuous over the entire length of an inversion run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination.

B. If the CIPP does not fit tightly against the original pipe at its termination point(s), the space between the pipes should be sealed by filling with a resin mixture compatible with the CIPP.

C. Restore to existing condition all excavations required for proper inspection of CIPP or repair of leads. Site restoration for the pipeline rehabilitation Work is considered included in the cost of construction unless otherwise indicated under separate pay items listed in the Proposal.

D. Due to the concern for longitudinal shrinkage in CIPP installations, the Owner reserves the right to re-inspect the cured-in-place pipe following installation to determine if openings cut for service connections remains properly aligned. The event that service connection openings shift from

original location, the Contractor shall be responsible for all costs associated with corrective measures for re-alignment and repair of lead openings.

3.10 FIELD QUALITY CONTROL

A. Testing of the installed cured-in-pace pipe shall be required by the Contractor using an approved, licensed third-party testing company. The test specimens for short term flexural properties shall be prepared per ASTM F1216 Section 8, ASTM F1743 Section 8 or ASTM F2019 Section 7.

B. Gravity pipe leakage testing in accordance with ASTM F1216, Section 8.2.
   1. If pipe segment is greater than 36-inch in diameter or contains service laterals, gauge the water tightness of the CIPP under a positive head during the curing process.

C. Site Samples
   1. Provide short-term flexural testing of the installed CIPP for each liner installed unless otherwise indicated.
      a. Testing shall be in accordance with ASTM F1216, ASTM F1743, or ASTM F2019 depending on the installation method used.
   2. Submit testing reports to the Owner within 14 days of CIPP installation.
   3. Collect enough additional liner specimens for delamination testing should post-installation inspection determine it is necessary.

D. Styrene Odor Control Monitoring
   1. Submit record of styrene level measurements to the Owner's Representative at the end of each working day.
   2. If a styrene odor complaint is received, Contractor shall mobilize device to the site of the complaint and measure styrene levels every 15 minutes for a minimum of one (1) hour at no additional cost to the Owner.

3.11 POST-INSTALLATION

A. Post-Installation Inspection of Pipelines
   1. Thoroughly clean the newly installed cured-in-place pipe, removing all debris and build-up that may have accumulated during construction.
   2. The intent for post-installation inspection involves televising with PACP reporting.
   3. Refer to Section 02704 for the minimum requirements for inspection of pipelines
      a. Measurement and Payment article does not apply.
      b. Provide the Owner all required deliverables within 10 calendar days of the CIPP installation.
   4. All costs associated with post inspection of pipelines shall be included in the unit price bid for **"Sewer, Cured-In-Place Pipe Lining, (__")"** unless separate pay items are included in the Proposal for the specific length of pipe described.

B. Submittal of video footage and inspection reports shall be in accordance with "Final TV Investigation and Log" and "Deliverables" of the Cleaning and Television Specifications. The Contractor shall provide two (2) copies of an external hard drive, which shall include inspection logs/index, reports for both the pre- and post- television inspection of the sewer in consecutive order, and all third party test results. The hard drive, inspection logs, reports for both the pre- and post- television inspections, and testing results shall be securely bound in a three ring binder or other method approved by the Engineer. Any loose (not bound) project material will not be accepted.

C. All testing results will be reviewed by the Engineer for compliance with Contract specifications. As-built testing will be included, and shall be included in the unit price per foot for CIPP installed.

3.12 NON-CONFORMING WORK

A. Non-conforming work is any work outside of the acceptable tolerances for the item of work identified within these specifications that is considered to affect the performance and/or future maintenance of the new CIPP.

B. The finished CIPP shall be continuous over the entire length of the liner and be free from visual defects such as foreign inclusions, dry spots, pinholes, and delamination.
   1. Any visual defects shall be repaired at the Installation Contractor's expense in a manner mutually agreed upon by the Owner and the Installation Contractor.
   2. Delamination testing in accordance with ASTM F 1216 may be required by the Owner at the expense of the Contractor should post-installation inspection reveal visual defects. Contractor is responsible for having extra test specimens available for testing.

C. Sections of continuous inward folding or overlapping of excess liner material (commonly referred to as "fins") of greater than three (3) times the pipe diameter will be reviewed with the Contractor and Owner for non-conformity.
   1. Sections protruding greater than 10% of the inside diameter of the host pipe will be repaired by mechanical means.
   2. Continuous sections extending greater than 25% of the length of the pipe will be repaired by mechanical means.
   3. Continuous sections protruding greater than 10% of the inside diameter of the host pipe and extending greater than 25% of the length of the pipe will be rejected and the entire length of the CIPP installed shall be replaced.
   4. Repairs and replacements needed to remedy sections of continuous inward folding or overlapping of excess liner material shall be completed at no cost to the Owner.

D. If movement of the cured-in-place pipe has occurred such that the house lead is partially closed, the Contractor shall excavate and reconnect the house lead by use of an approved saddle at no cost to the Owner.

E. Removal and replacement of out of tolerance CIPP installations, reconnection of blocked service lines, and all equipment, labor, and materials for excavations, backfill and surface restoration to complete the Work shall be performed at no cost to the Owner.

3.13 WARRANTY

A. Warranty the installed product for a period of one (1) year.

B. If the Owner finds evidence of a reversal of curvature, shortening of the ends or constriction of house leads, the Contractor shall return and restore service and end seals promptly, as part of warranty work.

C. During the warranty period, repair any defects which will affect the integrity or strength of the cured-in-place pipe in a manner mutually agreed by the Owner and the Contractor.

D. The cost of cured-in-place pipe repairs during the warranty period shall be borne by the Contractor.

3.14 Attachments

A. Examples of the Service Connection Form, Wet-Out Report, Water Curing Log, and Odor Documentation Form

CIPP Quality Control/Quality Assurance Form

Example Service Connection Documentation Form

Contract:______________________________Contract No: ______Location: Street/RW __________ MH ___ to MH _____ Size _______ Length ________

Contractor: ____________________ ______Installer: __________________ Inspector ____________________

Report No: ________ Weather: __________ Temp: _____

Other Work: By-pass Pumping:______ Cleaning: ______ Point Repairs: ______CCTV: _______ Traffic Control: ______

INSPECTOR: Verify and document the condition of all service connections reinstated by the contractor.

Service Location	Type Defect	Repair Req'd	Comments	Defect Location	Type Defect	Repair Req'd	Comments
46.5	Leaking between CIPP & host pipe	Yes	Grout required				
78.9	Overcut Connection	Yes	Install Connection Hat				

Owners Representative: ______________________________ Signature: ________________________________Date: __________

Contractors Representative: ______________________ ______Signature: __________________ ______________Date: __________

Comments:________:____

Wet Out Report

Wet Out Request

Date _____ **Diameter, in** _____

Project No. _____ **Thickness,mm** _____

Basin No. _____ **Measured Length, ft** _____

Install No. _____ **Wet Out Length, ft** _____

MH No.'s _____ **Dry Length, ft** _____

Total Length, ft _____

Liner No. _____ **Liner Dia.** _____ **Liner Thickness** _____

Resin Type _____ **Lot No.** _____

Wet Out Lgth _____ ft X _____ Lbs/Ft = _____ Total lbs of Resin

Roller Gap Setting (T2+2mm) _____ mm

Totals

Total Resin Used _____ Lbs

Total Perkadox Used _____ Lbs

Total Trig KSM Used _____ Lbs

Total Styrene Used _____ Lbs

Total Acetone Used _____ Lbs

Liner Footage

0 _____	350 _____	700 _____	1050 _____
50 _____	400 _____	750 _____	1100 _____
100 _____	450 _____	800 _____	1150 _____
150 _____	500 _____	850 _____	1200 _____
200 _____	550 _____	900 _____	1250 _____
250 _____	600 _____	950 _____	1300 _____
300 _____	650 _____	1000 _____	1350 _____

Wet Out Time

Prep _____ Hrs

Mixing & Filling _____ Hrs

Conveyer _____ Hrs

Clean Up _____ Hrs

Total Hours to Wet Out _____ Hrs

Supervisor: _____ (Signature)

Crew: _____

Date: _____

Maintain complete and accurate records of every step of the curing process and record all thermocouple temperatures from the start of the process to complete cool down of the liner

WATER CURING LOG

NOTE: Continue to log pressure and temperature every 15 minutes through warm up, full water temperature and cool-down phase.

Date: _____ Job Name: _____
Sec. No.: _____

Job No.: _____ Diameter: _____
Length: _____ Thickness: _____
Boiler #: _____ Operator

From MH# _____ To MH# _____ _____

Direction of water flow: Upstream: _____
Downstream: _____

WEATHER	
Normal	
Hot	
Rain	
Cold	
Snow	

THERMOCOUPLES									
TIME/15 min interval	BOILER PRESSURE	TUBE PRESSURE	TUBE TEMPERATURE	THERMO #1	THERMO #2				
WARM UP									
EXOTHERM									
COOL DOWN									

Reviewed By:_____ **Date:** _____

CIPP Quality Control/Quality Assurance Form

Example Odor Documentation Form

Contract:______________________________ Contract No: ____________ Location: Street/RW ____________________

Contractor: ____________________ Installer: __________________ Inspector ____________________

Report No: ________ Weather: __________ Temp: ______

Other Work: By-pass Pumping:_______ Cleaning: _______ Point Repairs: _______ CCTV: ________ Traffic Control: _______

Inspector: Ensure that informational literature is distributed to affected properties and/or make arrangements to have measurements of the styrene concentrations, using the applicable Detector Tube testing device, taken by a testing laboratory. Document all readings taken.

MH-MH	Pipe	Pipe	Quality	Performance	Acceptable	Quality	Inspection		Comments
	Size (in)	Length (ft)	Control Specified	Standard	Quality	Assurance Performed	Yes	No	

Owners Representative: ____________________ Signature: ____________________ Date: __________

Contractors Representative: ____________________ Signature: ____________________ Date: __________

Comments: ____

Note: Insert all Quality Control References included in the specifications

END OF SECTION

SECTION 02709

SECTIONAL CURED-IN-PLACE PIPE (SCIPP)

PART 1 GENERAL:

1.1 SUMMARY

A. This Section shall include all work, materials, labor, and equipment necessary to provide for rehabilitating gravity flow sewer pipelines by the installation of a resin-impregnated flexible tube that will cure into a hard impermeable sectional cured-in-place pipe (SCIPP) that shall be placed as four (4) foot section patches, tight-fitting, watertight pipe-within-a-pipe.

B. Related Requirements
1. Section 02030 – Sequence of Construction and Special Project Requirements
2. Section 02141 – Temporary Bypass Pumping
3. Section 02704 - Internal Sewer Inspection
4. Section 02751 – Cleaning of Sewer Lines

1.2 MEASUREMENT AND PAYMENT

A. Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__")……Lft
Sewer Lining shall be paid for at the Contract bid price per linear foot for actual linear footage of cured-in-place pipe installed in the field, complete in place, for the size of pipe installed. Measurement shall be from center of structure to center of structure. Payment for the cured-in-place pipe shall also include the cost of sealing the pipe in the manholes, reworking the manhole inverts and benches, and all required testing.

B. The following work items shall be included in the Contract bid price per linear foot for **Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__"),** unless otherwise described
1. Identification of existing live taps
2. Styrene Odor Control Plan
3. Bypassing of flow
4. Air Testing (sampling and measuring of styrene odors)
5. Removal of line obstructions
6. Proper disposal of cure water
7. Reinstating lateral connections
8. Sampling and testing of cured-in-place pipe
9. Post installation T.V. inspection with PACP reporting
10. Clean-up
11. Site Restoration
12. All additional items described herein as incidental to the Work

C. Any additives, resin modifications, installation methods, or other changes in Work necessary to reduce styrene odors shall be indicated in the Styrene Odor Control Plan and shall be included in the Contract bid price per linear foot for **Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__")**.

1.3 REFERENCES

A. Abbreviations and Acronyms
1. CIPP – Cured-in-Place Pipe
2. SCIPP – Sectional Cured-in-Place Pipe
3. ITCP – Inspector Training Certification Program
4. PACP – Pipeline Assessment and Certification Program (most current version)
5. RIFI – Resin-Impregnated Fabric Inversion Liner

B. Reference Standards
1. ASTM D 790 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
2. ASTM D 5813 – Standard Specification for Cured-in-Place Thermosetting Resin Sewer Piping Systems
3. ASTM F 1216 – Standard Practice for Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube
4. ASTM F 1743 - Standard Practice for Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe
5. ASTM F 2019 – 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)
6. ASTM F 2994 – Standard Practice for Utilization of Mobile, Automated Cured-In-Place Pipe (CIPP) Impregnation Systems
7. All Work shall comply with the reference standards unless specifically stated otherwise in the Specification
8. References to standards which are made part hereof shall be latest edition thereof

1.4 ADMINISTRATIVE REQUIREMENTS

A. Access
1. Determine locations of appropriate access points (manholes) for cured-in-place pipe installation.
2. Obtain access rights from private property owners when access across private property is necessary to reach access manholes due to easement congestion which limits equipment travel within existing easements, unless provided by Owner.

B. Coordination
1. Provide adequate notification of Work to private property owners that are connected to the sewer being lined whose building laterals will be out of service during the cured-in-place pipe installation, curing, and restoration processes.
2. Notification shall;
   a. Be in writing via door hanger, door flier, or U.S. Mail given 24 hours but no more than 48 hours in advance of service loss (excluding weekends and holidays)
   b. Clearly state purpose of the Work.
   c. Advise all affected customers against water usage until the sewer line is placed back in service.
   d. Clearly state the potential consequences of using wastewater generating facilities during the time the building sewer service will be out of service.
   e. Include a 24-hour contact telephone number for questions regarding the Work.
3. Limit service outage for any property served by the sewer to no more than 24 hours.

C. Prepare a Styrene Odor Control Plan to minimize project specific styrene odors at the project site and surrounding areas.
   1. Submit with Bid Proposal.
   2. Styrene odor control plan will be used to evaluate the qualifications of the bidder.

D. Collect and dispose of cure water to an Owner approved location when lining sewers that discharge to open waterways.

E. Restore all property in the Project Work Area to a condition equal to or better than existing following completion of construction.

F. Final acceptance of each line segment is contingent on completion and acceptance of sample testing and receipt and approval of post-installation T.V. inspection.

1.5 PROJECT WORK PLAN

A. Prepare a Project Work Plan (PWP) in advance of the pre-construction meeting which clearly defines the CIPP product delivery in conformance with the requirements of the Contract Documents. The PWP shall at minimum contain:
   1. Detailed installation plan describing all Work necessary and appropriate for a complete CIPP installation.
   2. Installation method, sequencing and schedule.
   3. Schedule of Submittals.
   4. Bypass pumping plan.
   5. Traffic control plan.
   6. Odor control plan.
   7. Engineering design calculations to for each length of cured-in-place pipe to be installed including the thickness of each proposed CIPP.
   8. Detailed public notification plan.
   9. Project contact list and defined responsibilities.
   10. Proposed procedures for product sampling and testing.
   11. Sample field documentation forms, reports, and logs.
   12. Outline of specific repair or replacement procedures for potential defects that may occur in the installed CIPP.

B. Compensation for all Work required for the preparation of the PWP shall be included in the cost of the project.

1.6 SUBMITTALS

A. CIPP Liner Design
   1. Provide preliminary design of CIPP liner with bid
   2. Provide secondary design of CIPP liner if necessary after pre-lining inspection
   3. Furnish certified design calculations stamped by a registered professional engineer prior to liner manufacture

B. Liner Tube data
   1. Manufacturer
   2. Description of product components
   3. Technical data sheets
   4. Certified information from manufacturer of the liner tube's nominal void volume

C. Liner Tube Coating
   1. Material safety data sheets (MSDS)
   2. Technical data sheets
   3. Recommended repair (patching) procedure, if applicable
   4. Design thickness

D. Raw Resin data
   1. Manufacturers of all formulated resin components: resin, catalysts, fillers, additives, and monomers
   2. Description and percentage utilization of each component for the resin formulation proposed
   3. Technical data sheets for all formulated resin components
   4. MSDS for all formulated resin components

E. Site Samples
   1. Provide flexural and tensile testing reports of CIPP samples from the last three (3) projects in which testing was completed
   2. Provide copies of design thickness calculations for the cured-in-place pipe from the flexural and tensile testing reports

F. Manufacturers' shipping, storage and handling recommendations for all components of the CIPP system.

G. Proposed tube wet-out and cure method, including:
   1. A complete description of the proposed wet-out procedure for the proposed technology.
   2. When epoxy resins are utilized, manufacturer's certification of compliance with ASTM F2994
   3. CIPP manufacturer's recommended installation and cure method - for each diameter and thickness of the CIPP to be installed

H. Licensed Testing Company to perform third-party flexural properties testing on representative samples collected from the installed CIPP.

I. Personnel Certifications
   1. Documentation of PACP certified personnel assigned to pre- and post-inspection televising of pipelines
   2. Documentation of ITCP certified personnel assigned to project

J. Styrene Odor Control Plan
   1. Method to continually monitor styrene resin odors in the project area during the liner installation, inversion, and curing process
   2. Method to contain styrene resin odors from the liner container truck
   3. Method to contain styrene odors during CIPP liner installation and curing
   4. Method to contain styrene resin odors from inversion water discharging after CIPP curing completion
   5. Name of the equipment for sampling and measuring styrene odors
   6. Sample Resident Notification Letter, addressing the issue of styrene odors and providing educational information on how to avoid the odors and what to do if the odors are present in a home/business/school
   7. Procedures for notifying schools, hospitals, and businesses impacted

8. Procedures for work progress should maximum permissible styrene odor levels be exceeded

1.7 QUALITY ASSURANCE

A. The Contractor shall carry out his operations in strict accordance with all Occupational Safety and Health Administration (OSHA) and manufacturer's safety requirements. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.

B. Products used in the Work identified herein shall be produced by manufacturers regularly engaged in the manufacture of cured-in-place liners for municipal water systems and with a history of successful production acceptable to the Owner.

C. Verification of Pipeline Inside Diameter
1. Prior to manufacture of the CIPP, the Contractor is responsible for verifying the inside diameter of the pipeline to be rehabilitated to assure a tight-fitting cured-in-place pipe is installed.
2. Sections of liner with visual defects, continuous or intermittent inward folding, or overlapping of excess liner material will be rejected, refer to "Section 3.13 – Non-Conforming Work" for acceptance criteria.

D. Styrene Odor Control Monitoring
1. Read and record styrene levels every one (1) hour with a Drager Tube or approved equal.
2. Measure styrene levels a maximum of 10 feet away from the inversion manhole while liner is being inverted and cured.
3. Notify Owner and implement procedures for work progress should styrene level readings exceed 50 parts per million (ppm) or resident complaints of excessive styrene odors are filed.

E. Minimum Qualifications
1. The installing Contractor shall be licensed by the CIPP lining system Manufacturer and shall have successful experience in the installation of CIPP lining systems in municipal wastewater systems.
   a. Provide a copy of the license/agreement or letter from the CIPP Manufacturer that certifies the use and installation of the CIPP lining system by the Contractor.
   b. The Contractor shall be familiar with the specified requirements and methods needed for proper performance of the liner system in accordance with the Work specified herein.
2. Contractor's Field Supervisor Foreman: Minimum five (5) years of continuous experience as a foreman/superintendent for a CIPP installation crew
3. Minimum CIPP installations of the proposed method by the Contractor in the past five (5) years:

Pipe Diameter Range	**Required Performance (inch-miles)**
Up to 18-inch	1,000
18-inch to 36-inch*	200
36-inch and larger*	50

* if in Contract

4. All CCTV work shall be performed under the supervision of personnel trained and certified in the use of NASSCO's PACP for the inspection of sewer mains.

PART 2 PRODUCTS:

2.1 CIPP MATERIALS

A. The Build America, Buy America Act (BABA), a part of the Infrastructure Investment and Jobs Act (Public Law 117-58), requires that recipients of U.S. Environmental Protection Agency (EPA) Congressionally Directed Spending (CDS) Grant use products that are produced in the United States for infrastructure projects, including construction, alteration, maintenance, or repair.
   1. Refer to Section 00853 for all requirements and standards with which the Contractor must comply with related to the BABA.

B. Liner tube
   1. Shall consist of one or more layers of flexible needled felt or an equivalent absorbent non-woven or woven felt fabric, felt/fiberglass or fiberglass that when installed will tightly fit the internal circumference of the existing conduit.
   2. Meet the requirements of ASTM F1216, ASTM F1743, ASTM D5813, ASTM F2019 or ASTM F2994 whichever is compatible with the CIPP system proposed.
   3. Capable of absorbing and carrying resins
   4. Constructed to withstand installation pressures and curing temperatures
   5. Have sufficient strength to bridge missing pipe segments
   6. Have the ability to stretch to fit irregular pipe sections, negotiate minor bends, and dimple at any service or branch connection.
   7. Uniform in thickness and, when subjected to installation pressures, will meet or exceed the designed finish wall thickness in accordance with ASTM F1216, Section 8.6.
   8. Mark liner tube for distance at regular intervals along its length, not to exceed 5 feet, and include the CIPP Manufacturers name or identifying symbol (brand).

C. Thermosetting Resin System
   1. Corrosion resistant unsaturated, isophthalic polyester or vinyl ester thermoset resin and catalyst system or epoxy resin and hardener that is compatible to the installation process and when properly cured within the tube composite meets the requirements of ASTM F 1216, ASTM F 1743 or ASTM F 2019, the physical properties herein, and those, which are to be utilized in the design of the CIPP for this project.
   2. The resin shall produce CIPP which will comply with or exceed the structural and chemical resistance requirements of this specification.
   3. Formulate the resin system for the subject project;
      a. Viscosity shall be conducive to its being saturated into the void space of the tube's matrix,
      b. Thixotropy shall be adjusted to minimize its migration during the tube installation process.
   4. The pot life of the catalyzed resin system should be such that it provides a reasonable timeframe for the tube to be installed.
   5. If necessary, add a dye (pigment), approved by the CIPP manufacturer, to the catalyst or resin to allow visual verification that the liner tube has been thoroughly wet-out.
   6. Resins that are expired are not permissible; ensure the resin system to be used is within the resin manufacturer's recommended shelf life.

D. Corrosion Resistance
1. Furnish a corrosion resistant, unsaturated, isophthalic polyester or vinyl ester thermoset resin and catalyst system, or epoxy and hardener compatible with the process that provides cured physical strengths specified herein.
2. The installed CIPP shall have a long term (50 years) corrosion resistance to typical chemicals found in domestic sewage.

E. Chemical Resistance
1. Provide in accordance with the requirements of ASTM F1216, Appendix X2.
a. Testing for chemical resistance shall be at the Owner's request.
b. Costs for chemical resistance testing to be borne by the Owner.
2. The pipe within-a-pipe, when cured, shall be chemically resistant to withstand internal exposure to sewage gases containing hydrogen sulfide, carbon monoxide and dioxide, methane gas, dilute sulfuric acid, and external exposure to soil bacteria and chemical attack which may be due to materials in the surrounding ground or sewage within.
3. The finished CIPP shall be fabricated from materials which, when cured, will be chemically resistant to withstand internal exposure to domestic sewage.

F. The color of the interior liner surface shall be light reflective and pre-approved by the Owner, to allow for adequate post installation inspection by closed circuit television.

G. Styrene Chemicals
1. Use minimal styrene chemicals for the CIPP resin to minimize styrene odors in residential homes and business office.
2. The maximum level of released styrene shall not exceed 50 ppm.

2.2 PHYSICAL STRENGTH

A. The CIPP system shall conform to the minimum initial structural standards, as listed below.

	Standard	Minimum Required
Flexural Strength	ASTM D 790	4,500 psi
Flexural Modulus of Elasticity	ASTM D 790	250,000 psi

Note: Samples from the project shall be taken and tested in accordance with Section 8 of ASTM F 1216 using either method. See Section 3.10, "Field Quality Control" of this Specification.

2.3 DESIGN

A. Provide measurement verification of the inside diameter of each pipeline to be rehabilitated signed by the installer of the CIPP with the design calculations.

B. Design CIPP wall thickness in accordance with Appendix X1, of ASTM F 1216 using the **fully deteriorated** pipe condition.

C. Design for a minimum fifty (50) year service life under continuous loading conditions.

D. Design such that the net inside diameter of the rehabilitated sewer is as large and smooth as possible.

E. Furnish design calculations **for each patch of pipe to be lined** (i.e. sectional) based on site-specific parameters (diameter, depth, ovality, etc.) and soil modulus and groundwater table levels to be reviewed by the Engineer.
   1. All calculations shall be signed and sealed by a Registered Professional Engineer.
   2. Multiple runs of the same diameter pipe may be included under a single design calculation if the remaining site-specific parameters do not exceed the parameters assumed in the calculation.
      a. Include site-specific parameters of each run included in the single design calculation.

F. Minimum CIPP liner thickness, unless otherwise specified, shall be determined utilizing design procedures outlined in ASTM F1216, Appendix X1, mechanical properties provided by the CIPP Manufacturer, and the following project specific design assumptions:

   1. Existing sewer is fully deteriorated
   2. Existing sewer is considered to have 2% ovality in circumference
   3. CIPP is subjected to a full soil load of 120 lbs/cft
   4. CIPP is subjected to traffic loads as calculated by AASHTO HS-20-44 Highway Loading over a flexible pavement
   5. Backfill material over pipe is classified as Class II with a modulus of soil reaction for pipe zone of 700 psi
   6. CIPP is subject to groundwater elevation five (5) feet below ground surface.

G. Sanitary sewers crossing beneath railroads is to be considered for this project.
   1. CIPP installations for railroad crossings shall be designed in accordance with ASTM F 1216, Appendix X1.
   2. CIPP designed will not be accepted when the wall thickness of the CIPP liner is greater than 2 inches.
   3. Railroad live loads shall be designed using Cooper E-80 Loading. Railroad load requirements are also provided in Section 3.2.3 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).
   4. Refer to Section 2.4, 3.2, and 3.16 within the CSX Design and Construction Standard Specifications for Pipeline Occupancies provided in the Special Project Requirements (Specifications Section 02030).

H. Submit price proposal for the length and size of pipeline specified assuming the finished liner is placed as the proper four (4) foot sectional liner at the location for rehabilitation.

I. Should pre-lining inspection reveal the sewers to be in substantially different conditions than those in the design considerations, the Contractor shall submit a “secondary design” to request such changes in CIPP wall thickness, supporting such request with revised design computations signed and sealed by a Registered Professional Engineer.
   1. Submit secondary design only upon authorization from the Owner.
   2. Determine costs to perform a secondary design and install a liner that differs from what was proposed during the bidding process in accordance with the contracting requirements of the Owner, prior to completing the Work.

PART 3 EXECUTION:

3.1 PRE-INSTALLATION

A. The following procedures shall be adhered to unless otherwise approved by the Owner's representative.

B. Rehabilitation work involving CIPP lining is not to be performed during wet weather events. The Contractor shall schedule work accordingly to avoid any forecasted rain events.
1. In the event a rain event occurs during rehabilitation work, The Contractor shall have bypass pumping equipment on site to facilitate wet weather flows.

C. Pre-Installation Cleaning of Sewer Lines
1. Remove all internal debris out of the sewer line that would prevent proper installation of the CIPP.
2. Refer to Section 02751 for the minimum requirements for cleaning of sewer lines

D. Pre-Installation Inspection of Sewer Lines
1. Inspect pipeline to determine the location of any conditions which may prevent proper installation of the fabric lining into the pipelines, and it shall be noted so that these conditions can be corrected.
2. Refer to Section 02704 for the minimum requirements for inspection of pipelines

E. Locate Service Connections
1. Record location of all service connections.
2. Determine capped and unused services with Owner.
3. Establish service connections to reinstate
   a. All service connections are to be reinstated unless otherwise directed by the Owner.
   b. Coordinate with the Owner any service connections that are not to be reconnected.
   c. Record plan for all service connections
4. Refer to sample Service Connection Documentation Form that follows this Section.

F. Bypassing Sewage
1. If the Contractor deems it is necessary to bypass pump the flow in the sewer being rehabilitated, the Engineer and Owner must approve of the bypass pumping.
2. Provide for the bypass pumping of sewage around the section or sections of pipe being installed.
   a. Bypass shall be made by plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or alternate system.
   b. The pump and bypass lines shall be of adequate capacity and size to handle all the anticipated flow.
   c. If pumping into alternate system, review system capacity to determine if it has adequate capacity to handle the additional flow.
3. The Contractor shall take adequate precautions to assure that no backup of sewage into basement drains occurs during installation.
   a. Monitoring of the surcharge levels during pumping operations is required 24 hours per day, 7 days per week.
   b. The Contractor shall be fully responsible for any damages resulting from his operation.

4. The Contractor shall distribute door hangars to the affected residents 24- to 48-hours prior to rehabilitation Work.
5. Refer to Section 02141 – Temporary Bypass Pumping for measurement details.
   a. Refer to Appendix C for supplementary flow range data.
   b. This data is to provide conservative maximum values and may not accurately represent flows within specific pipes.
6. All costs associated for the bypass pumping of sewage around the section or sections of CIPP being installed shall be included in the unit price bid for "**Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__")"** unless separate pay items are included in the Proposal for the Work described.

G. Line Obstructions
1. Clear line obstructions such as solids, protruding service connections or collapsed pipe that will compromise the proper installation of the CIPP lining.
2. Remove service leads excessively protruding into the pipe more than 5% of the pipe's internal diameter.
   a. Use a remote saw cutter or similar method, subject to the approval of the Engineer.
   b. Refer to Section 02751 for the minimum requirements for cutting protruding service leads.
3. If inspection reveals an obstruction that cannot be removed by remote internal type equipment, then the Contractor shall notify the Owner.

H. Infiltration Control
1. Contractor shall evaluate amount of infiltration that is occurring at the time of the work, and determine the approach needed for control of any infiltration that may be present to ensure a successful CIPP liner installation. The Contractor must demonstrate their rationale that supports use (or non-use) of infiltration control measures.
2. Pay item is included in the Contract for joint grouting to provide compensation where this measure is necessary for a successful CIPP liner installation.
3. Installation of a pre-liner where necessary is to be incidental to the pay item for CIPP lining.

I. Owner's Review of Pre-Lining CCTV Videos
1. Submit pre-installation inspection videos and reports of sewers to be lined a minimum one (1) week prior to planned lining.
2. No sewers are to be lined until the Owner has authorized the Contractor to proceed with the CIPP installation.

J. Contractor's Review of Pre-Lining CCTV Videos
1. Review the pre-installation inspection videos and reports of sewers to be lined.
2. Determine if the condition of the host pipe is acceptable to receive the CIPP installation.
3. Submit a "secondary design" should the pre-installation inspection reveal the sewers to be in substantially different conditions than those in the design considerations
4. Install pre-liner, per manufacturer's recommendation, where the host pipe material is not compatible with the proposed CIPP product; include this work in "secondary design" submittal.

K. Prior to any lining, the Contractor shall certify that a minimum of two (2) robotic reinstatement cutters (for reconnecting services) are available for use on this project.

3.2 RESIN IMPREGNATION

A. Designate a location where the uncured resin in the original containers and the unimpregnated tube will be vacuum impregnated prior to installation.
   1. Impregnation to be performed in a regulated, quality controlled facility in accordance with local ordinances.
   2. Allow the Owner to inspect the materials and “wet out” procedure.
   3. Utilize a resin and catalyst system compatible with requirement of this method.

B. Document the volume of resin placed in each tube and the volume of resin indicated by the tube’s manufacturer for a complete filling of the void space.
   1. Call to the attention of the Owner/Engineer any tube failing to accept the full amount of resin per the tube manufacturer’s specifications prior to installation to allow for a visual inspection.
   2. Tube’s failing to accept at least 95% of the prescribed resin amount shall be reviewed by the manufacturer and certified to the Owner/Engineer of its acceptability for use prior to its installation.

C. Prepare a “Wet Out Report” for each liner
   1. CIPP systems conforming to ASTM F2994 shall provide wet out reports to the Owner for each installation in digital format.
   2. Record wet out quantities on the “Wet Out Report”.
   3. Submit to the Owner or Owner’s representative with each liner delivery.
   4. Refer to a sample “Wet Out Report” that follows this Section.

3.3 INSTALLATION OF CIPP (INVERSION METHOD)

A. Pressurized air liner inflation/steam is prohibited in sewers greater than 12 inches in diameter, unless otherwise indicated.

B. Provide manufacturer calculated minimum pressure required to hold the tube tight against the existing conduit and maximum allowable pressure so as to not damage the tube.

C. Install resin-impregnated tube in accordance with ASTM F 1216.
   1. Maintain pressures between manufacturer minimum and maximum allowable pressures until the installation is complete.

D. Take suitable precautions to eliminate hazards to personnel in the proximity of the construction when pressurized air is being used.

E. No Pull-in method shall be utilized. The unrolling action of the tube during inversion is necessary to minimize gouging and for stretching and accommodating bends encountered. Also, for non-circular sections the tube inversion will minimize folds and uneven stretching which would result in thinning of the upper portion of the CIPP.

3.4 CURING (NON-U/V APPLICATIONS)

A. Required Curing Parameters (for both steam and heated water)
   1. Provide the temperature required to affect a cure of the resin as recommended by the resin manufacturer.

2. Provide manufacturer estimated maximum and minimum pressures required to hold the flexible tube tight against the existing conduit during the curing process.

B. Cure the CIPP in accordance with ASTM F 1216 and ASTM F 1743.
1. Fit the heat source with suitable monitors to gauge the temperature of the incoming and outgoing water supply.
2. Place an additional gauge within the impregnated tube and also at the pipe invert at the remote manhole to determine the in place liner temperature during cure.
3. Comply with recommendations from resin manufacturer for water temperature in the line during the cure period.

C. Prepare a CIPP "Curing Report" for each CIPP installation.
1. Log actual temperature readings at various time increments as noted in the "Curing Report" during the curing process.
2. Submit to the Owner/Engineer upon request.
3. Refer to a sample "Curing Report" that follows this Section.

3.5 CURING (U/V APPLICATIONS)

A. Required Curing Parameters
1. Provide the rate of travel for the ultraviolet curing lights required to allow for cross-linking/polymerization and curing of the CIPP resin as recommended by the system manufacturer.
2. Provide manufacturer estimated maximum and minimum pressures required to hold the flexible tube tight against the existing conduit during the curing process.

B. Cure the CIPP in accordance with ASTM F 2019.

C. Prepare a CIPP "Curing Report" for each CIPP installation.
1. Maintain log of time, rate of travel of the ultraviolet assembly, and pressures maintained during the curing process.
2. Submit to the Owner/Engineer upon request.

3.6 COOL-DOWN

A. Cool the new CIPP in accordance with ASTM F 1216 and ASTM F 1743.

B. Take care in the release of the static head or air pressure so as not to develop a vacuum that could damage the newly installed CIPP.

3.7 SEALING CIPP AT MANHOLES

A. If a SCIPP is required at the end of a pipe segment or at the entrance or exit of a manhole, the following procedures are to be followed.

B. Seal the manhole walls, at all manhole inverts in accordance with CIPP system manufacturer's recommendations.

C. Terminate the CIPP at the manhole by trimming the liner end back within approximately two (2) inches of the outlet. Finish the liner connection with hydraulic cement.

D. Assure completed liner terminations are free of rough edges with smooth transition into the receiving structure.

E. Seal shall be of a resin mixture compatible with the installed liner system.

3.8 SERVICE CONNECTIONS

A. After the cured-in-place pipe has been installed, reconnect existing active house lead connections. This is to be done without excavation and from the interior of the newly installed liner by the use of a remote-controlled cutting device. All active connections shall be satisfactorily opened to the approximate size and shape of the original opening and shall be smooth and flush wherever there is a chance of debris buildup. If a service connection has been deemed inactive by the Owner, it can be left unopened if approved by the Owner. All opened services shall be finished brushed. No additional payment will be made for excavations for the purpose of reopening service connections and the Contractor will be responsible for all costs associated with such excavation and restoration Work. Any damages occurring from services which are not re- opened shall be incurred solely by the Contractor.
   1. Cut a relief hole through the liner at each opening to relieve any water that has accumulated in the leads during the lining process.
   2. Complete reconnections without excavation, and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a cutting device that re-establishes the service connection to 100% of its original capacity.
      a. Remove pipe fragments or liner fragments which may obstruct flow or snag debris.
      b. Correct overcut openings with a repair patch of a resin mixture compatible with the liner system and of sufficient size to completely cover the overcut.
      c. Brush the full circumference of all completed service connections to eliminate rough or jagged edges of the liner.
   3. Record status and condition of each service connection.
   4. Refer to sample Service Connection Documentation Form that follows this Section.

B. All leads to be reinstated shall be reconnected within 24 hours.
   1. No lead shall remain out of service for more than 24 hours.
   2. If a lead problem occurs where a lead will remain out of service, the Contractor will provide emergency service at the Contractor's cost.

C. Remove coupons of pipe material resulting from service tap cutting
   1. Collect at the next manhole downstream of pipe rehabilitation operation prior to leaving site.
   2. Coupons are prohibited from passing through the sewer collection system.

D. All costs associated with reinstating laterals shall be included in unit price bid for each **"Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__")"**.

3.9 FINISH

A. The finished cured-in-place pipe shall be placed as a sectional four (4) foot patch on the location designated for rehabilitation and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination.

B. If the CIPP does not fit tightly against the original pipe at its termination point(s), the space between the pipes should be sealed by filling with a resin mixture compatible with the CIPP.

C. Restore to existing condition all excavations required for proper inspection of CIPP or repair of leads. Site restoration for the pipeline rehabilitation Work is considered included in the cost of construction unless otherwise indicated under separate pay items listed in the Proposal.

D. Due to the concern for longitudinal shrinkage in CIPP installations, the Owner reserves the right to re-inspect the cured-in-place pipe following installation to determine if openings cut for service connections remains properly aligned. The event that service connection openings shift from original location, the Contractor shall be responsible for all costs associated with corrective measures for re-alignment and repair of lead openings.

3.10 FIELD QUALITY CONTROL

A. Testing of the installed cured-in-pace pipe shall be required by the Contractor using an approved, licensed third-party testing company. The test specimens for short term flexural properties shall be prepared per ASTM F1216 Section 8, ASTM F1743 Section 8 or ASTM F2019 Section 7.

B. Gravity pipe leakage testing in accordance with ASTM F1216, Section 8.2.
   1. If pipe segment is greater than 36-inch in diameter or contains service laterals, gauge the water tightness of the CIPP under a positive head during the curing process.

C. Site Samples
   1. Provide short-term flexural testing of the installed CIPP for each liner installed unless otherwise indicated.
      a. Testing shall be in accordance with ASTM F1216, ASTM F1743, or ASTM F2019 depending on the installation method used.
   2. Submit testing reports to the Owner within fourteen (14) days of CIPP installation.
   3. Collect enough additional liner specimens for delamination testing should post-installation inspection determine it is necessary.

D. Styrene Odor Control Monitoring
   1. Submit record of styrene level measurements to the Owner's Representative at the end of each working day.
   2. If a styrene odor complaint is received, Contractor shall mobilize device to the site of the complaint and measure styrene levels every 15 minutes for a minimum of one hour at no additional cost to the Owner.

3.11 POST-INSTALLATION

A. Post-Installation Inspection of Pipelines
   1. Thoroughly clean the newly installed cured-in-place pipe, removing all debris and build-up that may have accumulated during construction.
   2. The intent for post-installation inspection involves televising with PACP reporting.
   3. Refer to Section 02704 for the minimum requirements for inspection of pipelines
      a. Measurement and Payment article does not apply.
      b. Provide the Owner all required deliverables within 10 calendar days of the CIPP installation.

4. All costs associated with post inspection of pipelines shall be included in the unit price bid for **"Sewer, Cured-In-Place Pipe Lining, Sectional, 4-foot, (__")"** unless separate pay items are included in the Proposal for the specific length of pipe described.

B. Submittal of video footage and inspection reports shall be in accordance with "Final TV Investigation and Log" and "Deliverables" of the Cleaning and Television Specifications. The Contractor shall provide two (2) copies of an external hard drive, which shall include inspection logs/index, reports for both the pre- and post- television inspection of the sewer in consecutive order, and all third party test results. The hard drive, inspection logs, reports for both the pre- and post- television inspections, and testing results shall be securely bound in a three ring binder or other method approved by the Engineer. Any loose (not bound) project material will not be accepted.

C. All testing results will be reviewed by the Engineer for compliance with Contract specifications. As-built testing will be included, and shall be included in the unit price per each CIPP sectional installed.

3.12 NON-CONFORMING WORK

A. Non-conforming work is any work outside of the acceptable tolerances for the item of work identified within these specifications that is considered to affect the performance and/or future maintenance of the new CIPP.

B. The finished CIPP shall be four (4) foot sections be free from visual defects such as foreign inclusions, dry spots, pinholes, and delamination.
1. Any visual defects shall be repaired at the Installation Contractor's expense in a manner mutually agreed upon by the Owner and the Installation Contractor.
2. Delamination testing in accordance with ASTM F 1216 may be required by the Owner at the expense of the Contractor should post-installation inspection reveal visual defects. Contractor is responsible for having extra test specimens available for testing.

C. Sections of continuous inward folding or overlapping of excess liner material (commonly referred to as "fins") of greater than three (3) times the pipe diameter will be reviewed with the Contractor and Owner for non-conformity.
1. Sections protruding greater than 10% of the inside diameter of the host pipe will be repaired by mechanical means.
2. Continuous sections extending greater than 25% of the length of the pipe will be repaired by mechanical means.
3. Continuous sections protruding greater than 10% of the inside diameter of the host pipe and extending greater than 25% of the length of the pipe will be rejected and the entire length of the CIPP installed shall be replaced.
4. Repairs and replacements needed to remedy sections of continuous inward folding or overlapping of excess liner material shall be completed at no cost to the Owner.

D. If movement of the cured-in-place pipe has occurred such that the house lead is partially closed, the Contractor shall excavate and reconnect the house lead by use of an approved saddle at no cost to the Owner.

E. Removal and replacement of out of tolerance CIPP installations, reconnection of blocked service lines, and all equipment, labor, and materials for excavations, backfill and surface restoration to complete the Work shall be performed at no cost to the Owner.

3.13 WARRANTY

A. Warranty the installed product for a period of one (1) year.

B. If the Owner finds evidence of a reversal of curvature, shortening of the ends or constriction of house leads, the Contractor shall return and restore service and end seals promptly, as part of warranty work.

C. During the warranty period, repair any defects which will affect the integrity or strength of the cured-in-place pipe in a manner mutually agreed by the Owner and the Contractor.

D. The cost of cured-in-place pipe repairs during the warranty period shall be borne by the Contractor.

3.14 Attachments

A. Examples of the Service Connection Form, Wet-Out Report, Water Curing Log, and Odor Documentation Form

CIPP Quality Control/Quality Assurance Form

Example Service Connection Documentation Form

Contract:________________________________ Contract No: _______ Location: Street/RW ____________ MH ___ to MH _____ Size ________ Length _________

Contractor: ______________________ _______ Installer: ____________________ Inspector ______________________

Report No: ________ Weather: ___________ Temp: ______

Other Work: By-pass Pumping:_______ Cleaning: _______ Point Repairs: _______ CCTV: ________ Traffic Control: _______

INSPECTOR: Verify and document the condition of all service connections reinstated by the contractor.

Service Location	Type Defect	Repair Req'd	Comments	Defect Location	Type Defect	Repair Req'd	Comments
46.5	Leaking between CIPP & host pipe	Yes	Grout required				
78.9	Overcut Connection	Yes	Install Connection Hat				

Owners Representative: ______________________ Signature: ______________________ Date: __________

Contractors Representative: ______________ ____ Signature: ____________ __________ Date: __________

Comments:________:____

Wet Out Report

Wet Out Request

Date _____
Project No. _____
Basin No. _____
Install No. _____
MH No.'s _____

Diameter, in _____
Thickness,mm _____
Measured Length, ft _____
Wet Out Length, ft _____
Dry Length, ft _____
Total Length, ft _____

Liner No. _____ **Liner Dia.** _____ **Liner Thickness** _____

Resin Type _____ **Lot No.** _____

Wet Out Lgth _____ ft X _____ Lbs/Ft = _____ Total lbs of Resin

Roller Gap Setting (T2+2mm) _____ mm

Totals

Total Resin Used _____ Lbs
Total Perkadox Used _____ Lbs
Total Trig KSM Used _____ Lbs
Total Styrene Used _____ Lbs
Total Acetone Used _____ Lbs

Liner Footage

0 _____	350 _____	700 _____	1050 _____
50 _____	400 _____	750 _____	1100 _____
100 _____	450 _____	800 _____	1150 _____
150 _____	500 _____	850 _____	1200 _____
200 _____	550 _____	900 _____	1250 _____
250 _____	600 _____	950 _____	1300 _____
300 _____	650 _____	1000 _____	1350 _____

Wet Out Time

Prep _____ Hrs
Mixing & Filling _____ Hrs
Conveyer _____ Hrs
Clean Up _____ Hrs

Total Hours to Wet Out _____ Hrs

Supervisor: _____ (Signature)
Date: _____

Crew: _____

Maintain complete and accurate records of every step of the curing process and record all thermocouple temperatures from the start of the process to complete cool down of the liner

WATER CURING LOG

NOTE: Continue to log pressure and temperature every 15 minutes through warm up, full water temperature and cool-down phase.

Date: _____ **Job Name:** _____
Sec. No.: _____

Job No.: _____ **Diameter:** _____
Length: _____ **Thickness:** _____
Boiler #: _____ **Operator** _____

From MH# _____ **To MH#** _____ _____

Direction of water flow: **Upstream:** _____
Downstream: _____

WEATHER	
Normal	
Hot	
Rain	
Cold	
Snow	

THERMOCOUPLES									
TIME/15 min interval	BOILER PRESSURE	TUBE PRESSURE	TUBE TEMPERATURE	THERMO #1	THERMO #2				
WARM UP									
EXOTHERM									
COOL DOWN									

Reviewed By: _____ **Date:** _____

CIPP Quality Control/Quality Assurance Form

Example Odor Documentation Form

Contract:__________ Contract No: __________ Location: Street/RW __________
Contractor: __________ Installer: __________ Inspector __________
Report No: __________ Weather: __________ Temp: __________
Other Work: By-pass Pumping:_______ Cleaning: _______ Point Repairs: _______ CCTV: _______ Traffic Control: _______

Inspector: Ensure that informational literature is distributed to affected properties and/or make arrangements to have measurements of the styrene concentrations, using the applicable Detector Tube testing device, taken by a testing laboratory. Document all readings taken.

MH-MH	Pipe	Pipe	Quality	Performance	Acceptable	Quality	Inspection		Comments
	Size (in)	Length (ft)	Control Specified	Standard	Quality	Assurance Performed	Yes	No	

Owners Representative: __________ Signature: __________ Date: __________
Contractors Representative: __________ Signature: __________ Date: __________
Comments: __________

Note: Insert all Quality Control References included in the specifications

END OF SECTION

SECTION 02990

PERMITS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes Permit documents that have been applied for the Owner. The Contractor is responsible for obtaining, purchasing required fees or deposits, and adhering to the rules, provisions, and specifications designed as part of the Permit Conditions. They are provided as information for the Contractor because the requirements and regulations contained in these documents shall be adhered to by the Contractor as they pertain to the Work done under this Contract.

B. Should any contradictions or discrepancies between the requirements of the Permits Section and other Sections of these Specifications be found, this section language shall have precedence.

C. Related Requirements
1. Section 00700 - General Conditions
2. Section 00800 - General Supplementary Conditions
3. Section 01000 - General Specifications

1.2 PRICE AND PAYMENT PROCEDURES

A. If no separate bid-item under the Bid Form is provided by the Owner, all costs for the Work described in this section shall be factored into the other contract bid prices.

1.3 REFERENCES

A. Abbreviations and Acronyms Definitions
1. AHJ – Authority Having Jurisdiction.

B. Definitions
1. Allowance - defined as a not-to-be-exceeded dollar amount, either individually or in the aggregate, which is established between the Owner and the Contractor as part of the bid documents when the precise scope of a particular line item(s) has not been defined to a level which is adequate for the Contractor to provide a definitive line item pricing for that particular scope of Work.
2. Authority Having Jurisdiction (AHJ) - The local agency or authority responsible for enforcing codes and issuing permits.
3. Permit - formal authorization in the form of a document issued by an Authority Having Jurisdiction (AHJ), such as a local government, county, state, or agency, that grants a person or business the right to perform certain construction or transport activities within the agency's jurisdiction.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Permits: Obtain all the associated permits listed in this section. The Contractor is responsible for meeting all requirements to successfully obtain permits including any specified bonding requirements, insurance, preparing applications, and meeting all other permit requirements.

1.5 CLOSEOUT SUBMITTALS

A. Provide to the Owner and Engineer copy(s) of the secured Applicable Permit(s) with documentation of amount paid.

PART 2 PRODUCTS

2.1 Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Ensure all applications contain complete and accurate information, including project description, site plans, and specifications.

3.2 PREPARATION

A. Obtain all necessary permits before initiating construction activities. This may require traveling, visiting AHJ offices or accessing online electronic application website modules in order to apply, file, and purchase permits .

3.3 PERMIT ACQUISITION

A. Pay all applicable fees and charges required by authorities.

B. Post permits visibly at the project site as required by the issuing authority

C. Comply with all conditions and requirements stipulated in each permit.

3.4 CLOSEOUT ACTIVITIES

A. At the end of all construction activity included in the Contract, upon acceptance from the Owner, ensure all permits are closed out and approvals obtained upon completion of Work.

3.5 ATTACHMENTS

A. The following permits are required as part of the Project and have been applied for by the Owner. Any costs associated with the Contractor obtaining these permits from the respective agencies shall be the Contractor's responsibility.
   1. EGLE Part 41 Permit ____
      a. Rehabilitation Work require the City obtaining a Part 41 permit from the Department of Environment, Great Lakes, and Energy.

2. CSX Railroad Permit____
   a. Work on pipe segments 5220, 5474, and 5481 require the City to obtain a permit from CSX railroad. Work on these segments shall not proceed until such a time that the permit is obtained. Should the permit not be obtained within the duration of the Contract, these pipe segments shall be descoped.
   b. Review and permit fees shall be managed by the City.
   c. Refer to the Permitting Information Packet attached to this section for insurance requirements.

B. The following permits have been secured and are attached for reference:
   1. MDOT ROW Permit # 77052-117127-26-040226
      a. See attached permit.

END OF SECTION

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MDOT
Michigan Department of Transportation

INDIVIDUAL CONSTRUCTION PERMIT

For Operations within State Highway Right-of-Way

Issued To:
City of Marysville

1255 Delaware Ave.
Marysville MI 48040-1566

Contact:
Jennifer Morreale
248-535-3320(O)
jmorreale@hrcengr.com

Secondary Contact:
Julien Nyberg
313-530-4272(O)
jnyberg@hrcengr.com

Permit Number: **77052-117127-26-040226**
Permit Type: **Individual Application**
Permit Fee:
Effective Date: Apr 02, 2026 to Apr 02, 2027
Bond Numbers:
Liability Insurance Expiration Date:

THIS PERMIT IS VALID ONLY FOR THE FOLLOWING PROPOSED OPERATIONS:

PURPOSE:

Sanitary Sewer Trenchless Rehabilitation. Sewer CIPP Lining and Pipe Joint Grouting.

STATE ROUTE: M-29 **CITY OF:** Marysville **COUNTY:** St. Clair County

View Location on Map

LATITUDE:	LONGITUDE:
42.902589665626174	-82.48094672547406

CONTROL SECTION:	MILE POINT FROM:	MILE POINT TO:	LOCATION:			
			LEFT	MEDIAN	RIGHT	TRANSVERSE
77052	0.000	0.000	X		X	

REQUISITION NUMBER:	WORK ORDER NUMBER:	MDOT JOB NUMBER:	ORG JOB NUMBER:

77052-117127-26-040226 Issued To:City of Marysville

This permit is incomplete without "General Conditions and Supplemental Specifications"

I certify that I accept the following:

1. I am the legal owner of this property or facility, the owner's authorized representative, or have statutory authority to work within state highway Right-of-Way.
2. Commencement of work set forth in the permit application constitutes acceptance of the permit as issued.
3. Failure to object, ***within ten (10) days*** to the permit as issued constitutes acceptance of the permit as issued.
4. If this permit is accepted by either of the above methods, I will comply with the provisions of the permit.
5. I agree that Advance Notice for Permitted Activities for shall be submitted **5 days prior** to the commencement of the proposed work.
   I agree that Advance Notice for Permitted Utility Tree Trimming and Tree Removal Activities shall be submitted **15 days prior** to the commencement of the proposed work for an annual permit.

CAUTION

Work shall NOT begin until the Advance Notice has been approved.

Failure to submit the advance notice may result in a Stop Work Order.

City of Marysville	**John DeLang**	April 02, 2026
	MDOT	**Approved Date**
TSC Contact Info	**Huron TSC**	**(989) 737-5715**

THE STANDARD ATTACHMENTS, ATTACHMENTS AND SPECIAL CONDITIONS MARKED BELOW ARE A PART OF THIS PERMIT.

STANDARD ATTACHMENTS:

1 Special Conditions For Underground Construction (2205C)
2 Special Conditions For Structures Over State Highways (2499)
3 ENVIRONMENTAL REQUIREMENTS FORACTIVITIES WITHIN MDOT RIGHT-OF-WAY (2486)
4 General Conditions (General Conditions)

77052-117127-26-040226 Issued To:City of Marysville

ADDITIONAL ATTACHMENTS:

1 Location_Maps_Busha_Hwy_3.pdf
2 Location_Maps_Busha_Hwy_2.pdf
3 Location_Maps_Busha_Hwy_1.pdf
4 Location_Maps_Gratiot_Blvd.pdf
5 Location_Maps_Overview.pdf
6 .WZD-125-E - 8in.pdf
7 122-NFW-SHL-(R) (2).pdf
8 110-TR-NFW-2L (1).pdf
9 102-Gen Notes.pdf
10 101-Gen-Spacing-Charts.pdf
11 R-83-C Utility Trenches.pdf

AMENDMENT ATTACHMENTS:

SPECIAL CONDITIONS:

1 The Department of Transportation does not, by issuance of this permit, assume any liability claims or maintenance costs resulting from the City of Marysville facility placed by this permit. The Department reserves the right to require removal of all or any portion of this facility as needed for highway maintenance or construction purposes without replacement or reimbursement of any costs incurred by the permitted or other party. The permitted will defend, indemnify and hold harmless the Department for any claims whatsoever resulting from the construction or the removal of the authorized by this permit.

2 All disturbed areas within the right of way shall be top-soiled, seeded and mulched to match existing areas per current MDOT standards and specifications.

3 MDOT is doing a concrete patch project on Gratiot, purpose start date is in April going until the end of Summer/Fall. If there is going to be any impacts to traffic on Gratiot (I94BL) it will need to be when our is not going or very clear coordination and communication between John DeLang and the contractor doing the pipe lining work. John DeLand contact information is 810-347-9250, DeLangJ1@michigan.gov.

4 Submit an advanced notice in CPS 5-21 days prior to start of work.
Submit a Completion Notice in CPS within 10 days of work being completed.
Temporary signs must be removed at the end of each day. Submit form 0561 MDOT Lane Closure Notification/Request Form a minimum of 7- business days prior to the start of requested closures and email to Castle, Kasey (MDOT) CastleK2@michigan.gov and DeLang, John (MDOT) DeLangJ1@michigan.gov.

5 All work shall be done per the 2020 Standard Specifications for Construction. Contractors are required to have a copy of the permit and onsite. If proper traffic control is not set up as shown in the attached typical MDOT will stop work until an onsite safety meeting with us is conducted. If Advance Notice is not submitted MDOT will require you to shut down until one has been submitted and approved.

Michigan Department
Of Transportation
2205C (03/10)

SPECIAL CONDITIONS FOR UNDERGROUND CONSTRUCTION

The following special permit specifications shall apply when the permittee is excavating or performing any underground activity within trunkline right of way and discovers existing contaminated soil and/or an abandoned underground storage tank:

1. In the event the permittee encounters environmental contamination and/or an underground storage tank in the right of way, the Michigan Department of Transportation (MDOT) shall be immediately notified. All Michigan Department of Natural Resources and Environment (MDNRE) and Federal Environmental Protection Agency (EPA) environmental requirements shall be complied with by the permittee. Unless the Department agrees in writing the following steps are to be taken:

    a. The contaminated material that has been removed shall be temporarily stockpiled per MDNRE requirements. If stockpiled on the right of way, the site shall not interfere with MDOT operations or create a traffic safety problem. Also, the contaminated material shall be placed on plastic sheeting or tarp having a minimum thickness of 6 mils or in trucks, roll off boxes, or other containers, such that no liquid may escape from the containment. At the end of each work day, the contaminated material shall be covered securely with plastic sheeting of 6 mil thickness or greater.

    b. Upon completion of any testing deemed necessary by the Department or the MDNRE, the material shall be disposed of in an approved waste disposal site unless otherwise directed by the MDNRE.

    c. In no case shall the contaminated material be stockpiled for longer than 45 days prior to disposal.

2. The permittee shall cooperate with MDOT personnel and pertinent regulatory agencies in resolving the contamination problem as required by law.

    a. The manner in which the permittee manages and secures the site shall not interfere with the MDOT's interests.

    b. The permittee shall not excavate as part of any site management operation within the one-on-one slope from the edge of shoulder without the permission of MDOT.

3. MDOT shall not indemnify or compensate the permittee for any costs or damages of any kind that the permittee incurs as the result of contamination encountered within the right of way. It is understood that the possibility of encountering contamination and the damages which might be incurred by the permittee because of the contamination are business risks the permittee assumes in choosing to locate and maintain facilities within the Right-of-Way.

    The permittee is responsible for any costs that it incurs to secure the contaminated site in such a manner as to meet the requirements of the MDNRE and/or EPA and the requirements of MDOT.

4. The permittee, upon approval of MDOT, may continue to place its facility through the contaminated area providing remedial actions that meet the approval of MDOT and other enforcement agencies involved are followed.

    a. All additional costs the permittee incurs, as a result of continuing to place its facilities within the contaminated area, are the responsibility of the permittee.

    b. All contaminated material must be removed and properly disposed of as directed by MDOT and/or the MDNRE. All backfill material must be clean material, unless otherwise directed by the MDNRE. Excavation must be backfilled in a manner to prevent the creation of a pathway for migration of contamination off site.

5. The permittee is solely responsible to develop an alternate route for its facility in the event approval cannot be given to continue to place the facility within the contaminated area of the Right-of-Way. The permittee shall restore the original site as directed by MDOT.

Michigan Department
of Transportation
2499 (08/05)

SPECIAL CONDITIONS FOR STRUCTURES OVER STATE HIGHWAYS

1. The permit applicant shall defend, indemnify, and hold harmless the Michigan Department of Transportation (MDOT) for any claims whatsoever resulting from the construction, maintenance, or removal of the structure authorized by this permit, from any claims for injuries to or death of any and all persons, for the loss or damage of property, and from environmental damage degradation, response, and cleanup costs resulting from the construction or presence of the structure authorized by this permit.

2. MDOT shall not assume any liability claims or compensate the permit applicant for any maintenance cost resulting from the construction of the structure.

3. MDOT reserves the right to require removal of the structure, or any portion thereof, if needed for highway maintenance or construction purposes.

4. MDOT shall not reimburse the permit applicant for any costs incurred by the permit applicant, or any other party, because of a requirement to remove the structure.

5. A right-of-way air space lease agreement shall be required by MDOT prior to the placement of the structure over the state trunkline right-of-way.

6. All structures serving the public within state trunkline right-of-way shall comply with the Americans with Disability Act of 1992.

7. The structure shall be free from all advertising.

8. The clear height of the structure's under-clearance above the traveled roadway and road shoulders shall meet a minimum under-clearance distance of 18 feet.

9. A long term agreement for inspection and maintenance shall be entered into by the party owning the structure and MDOT.

10. An approved permit shall be required prior to the erection of any part of the structure.

ENVIRONMENTAL REQUIREMENTS FOR ACTIVITIES WITHIN MDOT RIGHT-OF-WAY

Issuance of a permit by MDOT does not relieve the permit applicant from meeting any and all requirements of law, or of other public bodies or agencies, including but not limited to the following:

1. Goemare-Anderson Wetland Protection Act, Part 303, P.A. 451 of 1994

   Any activity that involves excavation or fill, located within a regulated wetland, requires a Michigan Department of Environment, Great Lakes, and Energy (EGLE) permit. Regulated wetlands are those systems that are contiguous to a lake or stream (within 500 feet), connected to a regulated wetland, or greater than five (5) acres in size.

2. Inland Lakes and Streams Act, Part 301, P.A. 451 of 1994
   Any activity located within the ordinary high-water mark of a regulated body of water, i.e., lake, stream, drain, pond, etc., requires a permit. Permit related questions can be directed to EGLE Water Resource Division staff and permit applications can be submitted to EGLE through the MiEnviro Portal System.

3. Soil Erosion and Sedimentation Control Act, Part 91, P.A. 451 1994
   Any construction activity located within MDOT Right-of-Way that is authorized by a MDOT permit is the responsibility of the permit applicant and is not covered under MDOT's Authorized Public Agency (APA) authority. Any land disturbance of one (1) acre or greater, or that is located within 500 feet of a lake or stream, requires a soil erosion permit. MDOT does not enforce SESC regulations for permitted activities. Permit applicants are required to obtain SESC permits from the local enforcing agencies (CEAs & LEAs).
   Soil erosion and sedimentation controls are required on all projects, even if a soil erosion permit is not required. Individuals performing work shall prevent sediment from entering any body of water or leaving the Right-of-Way.

4. Clean Water Act: National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Requirements for Construction Activities
   Any earth disturbance of five (5) acres or greater requires an NPDES Storm Water Discharge Permit from EGLE Water Resources Division. Permit related questions can be directed to EGLE Water Resource Division staff and permit applications can be submitted to EGLE through the MiEnviro Portal System.

5. EGLE Water Resource Division also administers the following environmental laws which may require review prior to construction:
   - Sand Dune Protection Act, Part 353, P.A. 451 of 1994.
   - Shore-lands Protection and Management, Part 323, P.A. 451 of 1994.
   - Great Lakes Submerged Lands Act, Part 325, and P.A. 451 of 1994.

6. There are state and federal agencies administering the following environmental laws which may require review prior to construction:
   - Endangered Species Act, Part 365, and P.A. 451 of 1994.
   - Michigan's Natural Resources and Environmental Protection Act (NREPA), Part 413, and P.A. 451.
   - The Lacey Act, 18 U.S.C. 42, as amended.
   - The Plant Protection Act of 2000, 7 U.S.C. 7701 et seq.
   - The National Invasive Species Act of 1996.
   - Archaeological and Historic Preservation Act of 1974.

7. Natural Resources and Environmental Protection Act (NREPA), Part 201, P.A. 451 of 1994
   Any spill or release in MDOT Right-of-Way is required to be cleaned up in accordance with Part 201 of NREPA. All cleanup and remediation activities will be directed, reviewed, and approved by the EGLE incident management staff.

8. Michigan Occupational Safety and Health Administration (MIOSHA) Hazardous Waste Operations and Emergency Response Standard (40-Hour HAZWOPER).
   Personnel responding to a spill or release in MDOT Right-of way are required to hold the 40-hour MIOSHA HAZWOPER certification. Uncertified companies are not permitted to conduct spill response activities.

Visit the EGLE webpage Environment, Great Lakes, and Energy for information related to individual program divisions and offices. Questions regarding these permits may be addressed by contacting the nearest EGLE district field office staff.

GENERAL CONDITIONS

This permit is issued subject to the following General Conditions:

1. This permit grants to the permittee only those rights specifically stated and no other. Maintenance work within the trunkline right of way may require a separate permit unless authorized within the scope of the annual permit.

2. Issuance of this permit does not relieve permittee from meeting any and all requirements of law, or of other public bodies or agencies. The permittee shall be responsible for securing including but not limited to any other permissions including or required by law including but not limited to cities, villages, townships, corporations, or individuals for the activities hereby permitted.

3. The permittee agrees as a General Condition of this permit to:

   a. Have in the permittee's or the permittee's representative's possession on the job site at all times the approved permit, advanced notice and any necessary plans or sketches.

   b. Submit Advance Notice through the online Construction Permit System (CPS) at least five (5) working days prior to commencement of any operations covered by this permit. No work shall start until an approved Advance Notice is e-mailed to the permittee.

   c. Perform no work except emergency work, unless authorized by the Department (Michigan Department of Transportation [MDOT]), on Saturdays, Sundays, or from 3:00 p.m. on the day proceeding until the normal starting time the day after the following holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

   d. Perform no work except emergency work during periods of inclement weather when reduced visibility or slippery conditions impair trunkline traffic.

   e. Provide and maintain all necessary precautions to prevent injury or damage to persons and property from operations covered by this permit.

   f. Furnish, install and maintain all necessary traffic controls and protection during permittee's operations in accordance with the Michigan Manual of Uniform Traffic Control Devices and any supplemental specifications set forth herein.

   g. Once work is initiated that includes any lane restrictions, that work must be continued daily until completed. A lack of work activity for more than 3 days will require the removal of lane closures at no expense to the Department.

   h. Notify the Department of completion of work authorized by this permit through CPS, so that final inspection may be made and surety deposit released (where applicable). Surety deposit will not be released until the work authorized by the permit has been completed and inspected, and all inspection charges billable to the permittee are paid.

4. Nothing in this permit shall be construed to grant any rights whatsoever to any public utilities, except as to the consent herein specifically given, nor to impair any existing rights granted in accordance with the constitution or laws of this state.

5. Any operations in the trunkline right of way not covered by permit and the appropriate Department specifications are in violation of the jurisdictional authority of the Department, with respect to the control of the trunkline right of way, unless approved by the Department. Any change or alteration in the permit activities requires prior approval of the Department and may require a new permit.

6. Performance of the requirements of this permit is the responsibility of the permittee. The permittee shall complete all operations for which this permit is issued in accordance with the General Conditions and conditions of this permit, by the specified completion date. The permittee shall meet all requirements of the current Department Standard Specifications for Construction, and the Supplemental Specifications set forth on/or incorporated as a part of this permit.

7. The construction, operation and maintenance of the facility covered by this permit shall be performed without cost to the Department unless specified herein. The permittee shall be responsible for the cost of restoration of the state trunkline and right of way determined by the Department to be damaged as a result of the activities of the permittee.

8. Facilities allowed on state trunkline right of way shall be placed and maintained in a manner which will not impair the state trunkline or interfere with the reasonable safe and free flow of traffic. Failure of the permittee to maintain the facilities located within the State trunkline right of way so as not to interfere with the operation, maintenance or use of the state trunkline by the traveling public may result in revocation of the permit.

9. The permittee is solely and fully responsible for all activities undertaken pursuant to the permit. Any and all actions by the Department and those governmental bodies performing permit activities for the Department pursuant to a maintenance contract, including but not limited to any approved reviews and inspections of any nature, permit issuing, and final acceptance or rejection of the work or activity authorized by the permit shall not be construed as a warranty or assumption of liability on the part of the Department or those governmental bodies. It is expressly understood and agreed that any such actions are for the sole and exclusive purposes of the Department and the governmental bodies acting in a governmental capacity. Any such actions by the Department and governmental bodies will not relieve the permittee of its obligations hereunder, nor are such actions by the Department and the governmental bodies to be construed as a warranty as to the propriety of the permittee's performance.

   Note: The following General Condition does not apply to municipalities with executed resolutions on file with MDOT.

   The permittee shall indemnify, defend, and save harmless the State of Michigan, Michigan Transportation Commission, the Department and all officers, agents and employees thereof, and those governmental bodies performing permit activities for the Department and all officers, agents and employees thereof, pursuant to a maintenance contract, against any and all claims for damages arising from operations covered by this permit except claims resulting from the sole negligence or willful acts or omissions of said indemnities, its agent, or employees. In addition, permittee upon request shall furnish proof of insurance coverage for the term of this permit in an amount pre-specified.

10. The permittee or representative must ensure that all insurance policies and binders include an endorsement by which the insurer

agrees to notify the Department in writing at least 30 days before there is a cancellation or material change in coverage. The permittee or representative must stop operations if any insurance is cancelled or reduced and must not resume operations until new insurance is in force. The State of Michigan, Michigan Transportation Commission, Department of Transportation, and governmental bodies performing permit activities under a maintenance contract, and all officers, agents, and employees of all the above, for claims arising out of, under, or by reason of operations covered by the permits issued to the permittee.

11. This permit is not assignable and not transferable unless specifically agreed to by the Department.

12. The permittee, upon request of the Department, shall immediately remove, cease operations, and surrender this permit, or alter or relocate, at the permittee's own expense, the facility for which this permit is granted. Upon failure to do so, the Department may take any necessary action to protect the trunkline interest and the permittee shall reimburse the Department for its costs in doing same. The permittee expressly waives any right to claim damages or compensation in the event this permit is revoked.

13. The permittee shall, upon request by the Department, furnish a performance surety deposit in the form of a bond, cash, certified check, or (when authorized by the Department) an irrevocable letter of credit in such amount as deemed necessary by the Department to guarantee restoration of the trunkline highway or performance under the General Conditions and conditions of the permit.

14. The permittee hereby acknowledges and agrees that the Department has the right to demand completion by the permittee, or the performance surety, or to complete any uncompleted activity authorized by this permit which adversely affects the operation and/or maintenance of the state trunkline highway, or which is not completed by the expiration date of the permit, including:

    a. Completion of construction of driveway and/or approach (not authorized by annual permit).
    b. Removal of materials.
    c. Restoration of the trunkline facilities and right of way as necessary for the reasonably safe and efficient operations of the trunkline highway.

    The permittee further agrees to immediately reimburse the Department in full for all such costs incurred by the Department upon receipt of billing, and that upon failure to pay, the Department may affect payment with the performance surety deposit. Should the surety deposit be insufficient to cover expenses incurred by the Department, the permittee shall pay such deficiency upon billing by the Department. If the surety deposit exceeds the expense incurred by the Department, any excess will be returned or released to the depositor upon completion of the work to the satisfaction of the Department.

15. The Department reserves the right during the time any or all of the work is being performed to assign an inspector to protect the trunkline interest, and to charge the permittee all such costs incurred. In addition, the permittee may be billed any engineering and review fees incurred by the Department or its agent in connection with the work covered by this permit.

16. Emergency Operations: In time of disaster or emergency, or when utility lines or facilities are so damaged as to constitute a danger to life and/or property of the public, access to the same may be had by the most expeditious route. Work is to be completed in a manner which will provide the traveling public with maximum possible safety and minimize traffic distribution. Notice of such situations shall be given to the nearest police authority and the department as soon as can reasonably be done under the circumstances. During normal Department work hours, the facility owner shall advise the Department of any operations within right of way which affect traffic operations or the highway structure or facilities prior to performance of the work. After normal Department work hours, the permittee, at the beginning of the first working day after the emergency operation, shall advise the Department of any operations which affect traffic operations or the highway structures and facilities. If determined necessary by the Department, the permittee shall secure an individual permit for such work after notification.

17. Upon the Department's request, as built drawings of work performed will be furnished to the Department within 30 days after completion of the work.

18. The permittee shall give notice to public utilities in accordance with Act 174 of 2013, as amended, and comply with all applicable requirements of this act. The permittee shall also comply with requirements of Act 451, P.A. of 1994, as amended.

19. The permittee acknowledges that the Department is without liability for the presence of the permittee's facility which is located within the trunkline right of way. Acceptance by the Department of work performed, and/or notice of termination of performance obligations for the surety and/or the permittee do not relieve the permittee of full responsibility for the permittee's work or for the presence of the permittee's facility in the trunkline right of way.

20. Where the Department has accepted an Indemnification Commitment in lieu of bond and/or insurance policies, such commitment is incorporated into this permit by reference.

21. It is illegal to discharge substances other than storm water into the Department's storm sewer system unless permission has been obtained in writing for other discharges.

22. The permittee shall be responsible for obtaining information on permitted environmental site closures within MDOT right of way. MDOT has implemented a program that allows environmental contamination to remain within the right of way by use of a permit. Issued permit information can be obtained from the Region/TSC in which the permit is issued. If the permittee will encounter a site area identified as a site closure permit area, the permittee shall follow instructions and conditions set forth in Supplemental Specifications #3 and specifications found in form 2205-C, "Special Conditions for Underground Construction".

23. Other than for normal daily vehicle and equipment usage requirements, the permittee shall not use or store unattended equipment, or the following types of hazardous materials on, over, under, or immediately adjacent to Department or Local Agency owned buildings, bridges and structures, unless expressly approved by the Department in writing;

    Explosive, flammable gas, non-flammable gas, inhalation hazard, oxygen, flammable liquids, fuel oil, combustible, gasoline, flammable solids, spontaneously combustible, dangerous-when-wet, oxidizer organic peroxide, toxic, poisonous, inhalation hazard, infectious, radioactive, corrosive, or any other potentially hazardous material.

    Furthermore, the permittee shall not allow hazardous or unreasonably objectionable smoke, fumes, vapor, or odors to emit from any permitted operation. No junk, garbage, refuse or unused construction materials shall be stored or accumulated within the MDOT Right-of-Way.

24. It is the responsibility of the utility owner to provide the depth and location of their facilities within MDOT ROW upon the department's request.

SUPPLEMENTAL SPECIFICATIONS

1. Construction and Maintenance of Facilities – To construct and maintain utility crossings of limited access highways, access for the utility's service vehicles may be from county roads, service roads, and openings authorized in limited access right of way fences. The construction of utilities across limited access highways should be for the purpose of serving a general area rather than providing individual services, unless extenuating circumstances necessitate such crossings.

   Equipment, vehicles or personnel will not operate within a distance of 30 feet from the edge of the pavement of roadways or ramps on limited access highways. At locations where utilities have been constructed in medians having a width greater than 80 feet or have otherwise been allowed to remain or to be constructed in limited access right of way, ingress and egress shall be by such routes as specified by the Department, which may also specify additional safety provisions.

2. Restoration- Restoration of the trunkline highway and right of way will be such that it will provide a condition equal to or better than the original condition, in accordance with Michigan Department of Transportation Standard Specifications.

3. Excavation and Disposal of Excavated Material – The permittee shall provide and place the necessary sheeting, shoring and bracing required to prevent caving, loss or settlement of foundation material supporting the pavement, or any other highway installation such as sewers, culverts, etc. The permittee shall assume the full responsibility for this protection and shall not proceed in these areas before approval of the methods by the Department.

   Construction equipment and excavating material shall not be stocked in such locations that it creates a traffic hazard or interferes with the flow of traffic; and on limited access highways, shall be a minimum of 30 feet from the traveled way. Sod and topsoil shall be stacked separately from other excavated material. The permittee shall dispose of all surplus and unsuitable material outside of the limits of the highway, unless the permit provides for disposal at approved locations within right of way. In the latter case, the material shall be leveled and trimmed in an approved manner.

   When the permittee is excavating within trunkline right of way and discovers existing contaminated soil and/or an abandoned underground storage tank, special permit specifications entitled "Special Conditions for Underground Construction" (Form 2205-C) shall apply.

4. Utility Cuts, Trenches and Pavement Replacement – Utility crossing by pavement cutting and removal are generally prohibited. If extenuating circumstances make tunneling, boring and jacking impractical pavement cutting may be used with approval of the Department. All utility cuts, trenching and pavement replacement shall comply with the requirements of the Standard Specifications and the Standard Plan "Utility Cuts, Trenches and Pavement Replacement". Unless otherwise specified, cuts in concrete residential and commercial drives shall be as above; except that the patch width shall be a minimum of 3 feet and the remaining slab from patch to existing joint shall be a minimum of 3 feet. Backfill shall be made with sand-gravel as specified in the Standard Specifications, unless otherwise directed. After the backfill has been placed and compacted by controlled density method, the pavement shall be replaced with new pavement of the original type and quality, unless at the season of the year when it is not feasible to replace pavement in kind. In this case, a temporary surface of bituminous material shall be placed with Department approval and later replaced with pavement of the original type at the applicant's expense. Other pavement types may be allowed with prior approval of the Department.

5. Crossing Roadbed by Tunneling or Boring and Jacking – All crossing of roadbed operations involving tunneling, boring and jacking shall comply with the Department's special provisions for such work.

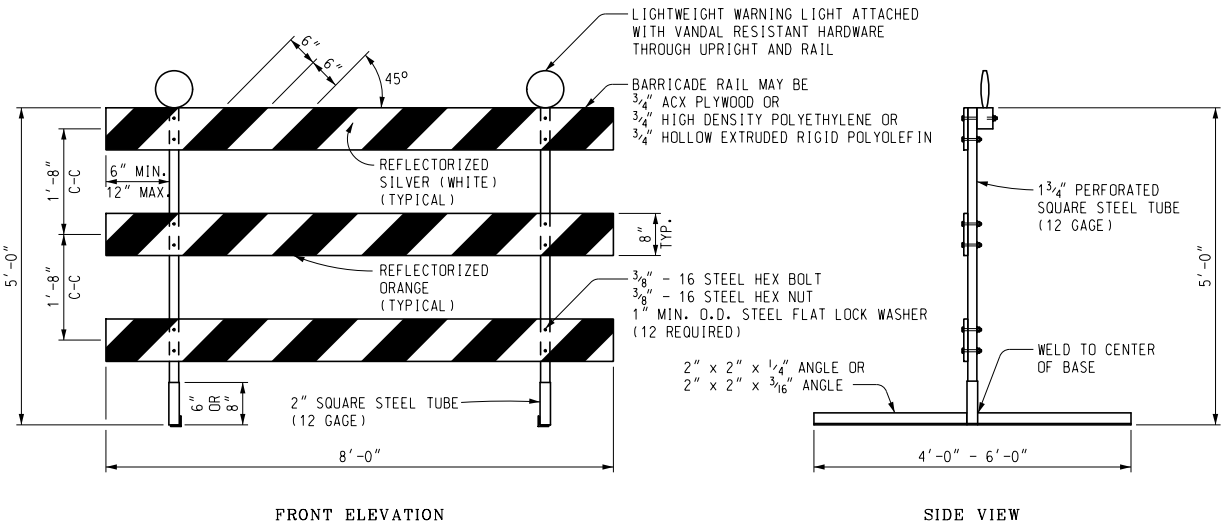
6. Backfilling and Compacting Backfill – Unless otherwise specified, all trenches, holes and pits shall be filled with sound earth or with sand-gravel if so provided, placed in successive layers not more than 9 inches in depth, loose measure, and each layer shall be thoroughly compacted by tamping. All backfill compaction will be subject to check by the controlled density method.

7. Depth of Cover Method- Unless otherwise authorized, pipes shall be placed to a depth that will provide not less than 6 feet of cover between the top of the roadway surface and the pipe, 3 feet cover below the ditch line. All bores across MDOT highways that are 12" or larger will require a geotechnical report that complies with the General Conditions and conditions of the permit.

8. Trees:

   a. The permittee is responsible for obtaining permission from abutting owners when trimming or removing trees on easement right of way.
   b. Tree removal or trimming may be undertaken only after submission of an "Advance Notice" through CPS, a field review by the Region Resource Specialist and an approved copy of the advanced notice is e-mailed to the permittee.
   c. Limbs, logs, stumps and litter shall be disposed of in a manner acceptable to the Department.
   d. Tree roots shall be bored a distance of one foot for each one inch of trunk diameter for underground utility installations

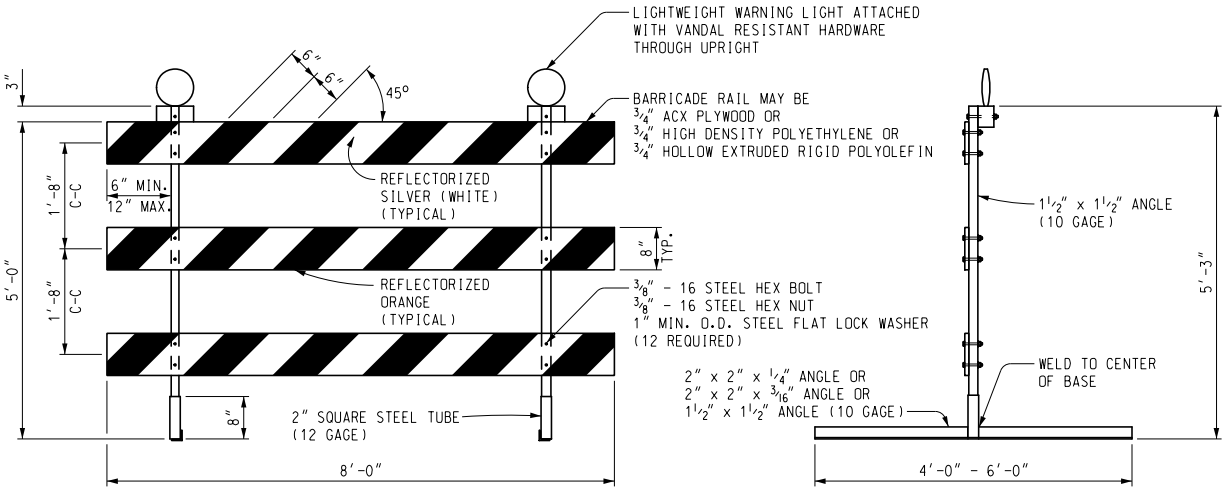
9. Aerial Wire Crossings – Vertical clearance of wires, conductors and cables over state trunkline shall not be less than required by Section 232 of the National Electrical Safety Code, except in no case shall the under-clearance below any wire, conductor, or cable, under any temperature or loading condition, be less than eighteen feet (18').



FRONT ELEVATION

SIDE VIEW

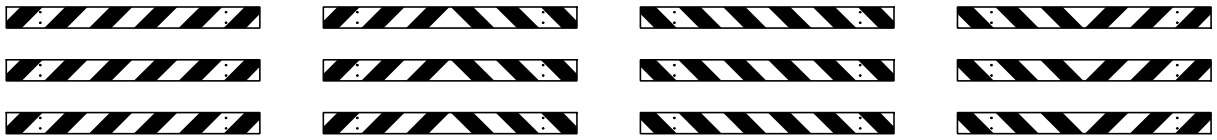
PERFORATED SQUARE STEEL TUBE OPTION



FRONT ELEVATION

SIDE VIEW

ANGLE IRON OPTION



LEFT DIRECTIONAL

BI-DIRECTIONAL

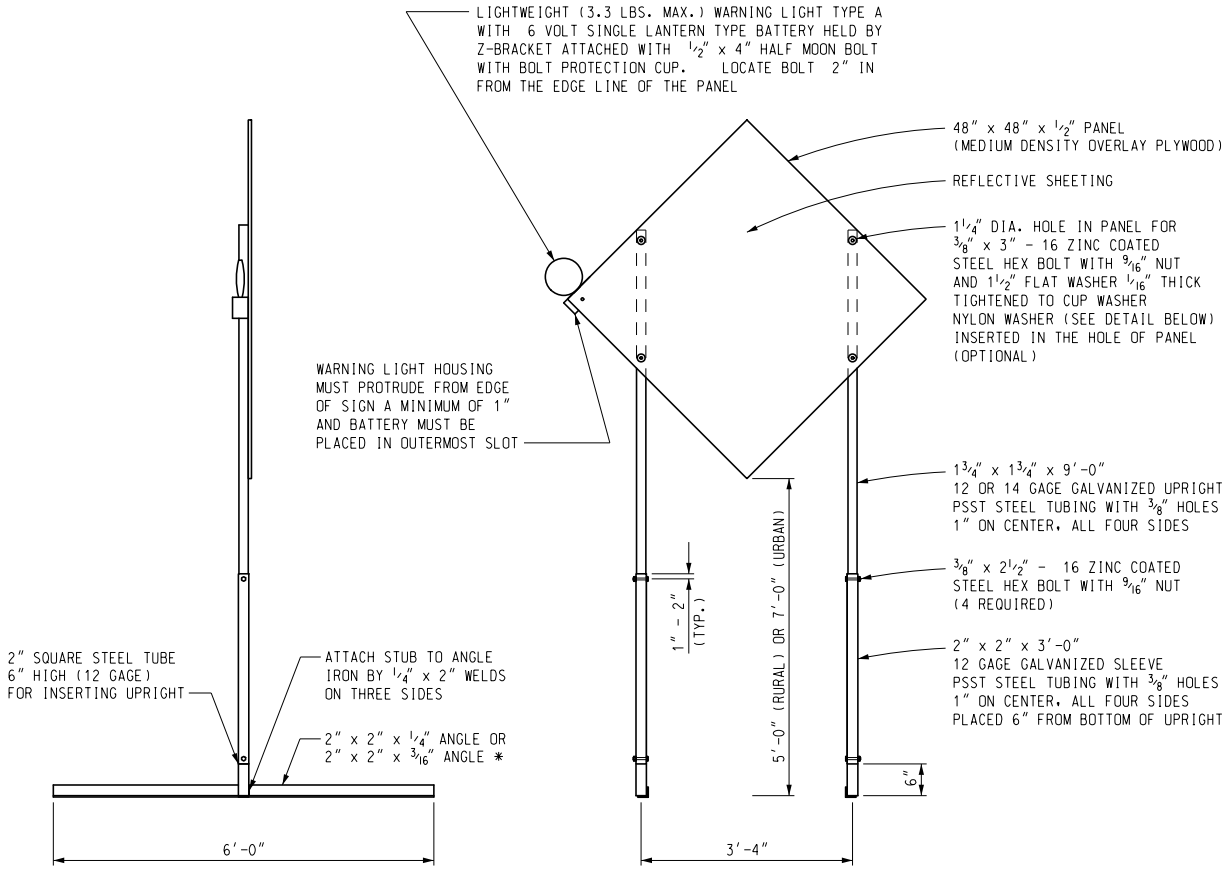
RIGHT DIRECTIONAL

CLOSURES

BARRICADE RAIL SHEETING OPTIONS
TYPE III BARRICADES

Other Type III Barricades meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm

MDOT Michigan Department of Transportation PREPARED BY OPERATIONS FIELD SERVICES DRAWN BY: ECH CHECKED BY: MWB	DEPARTMENT DIRECTOR Paul C. Ajegba APPROVED BY: _____ DIRECTOR, BUREAU OF FIELD SERVICES APPROVED BY: (SPECIAL DETAIL) DIRECTOR, BUREAU OF HIGHWAY DEVELOPMENT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF FIELD SERVICES SPECIAL DETAIL FOR Temporary Traffic Control Devices	
		F.H.W.A. APPROVAL	6/16/22 PLAN DATE	WZD-125-E	SHEET 1 OF 3



SIDE VIEW

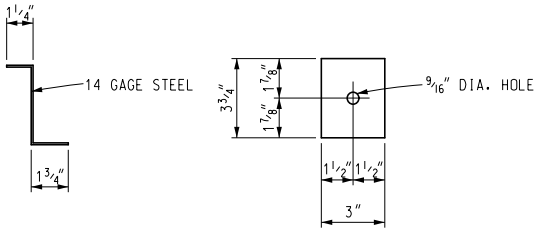
FRONT ELEVATION

TEMPORARY SIGN SUPPORT

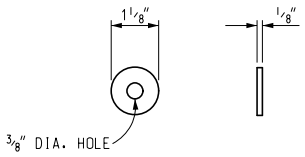
(WARNING LIGHT PLACED ON SIDE CLOSEST TO TRAFFIC)

* SIGN STAND IS BALLASTED WITH FOUR OR MORE 35 LB SANDBAGS. A MINIMUM OF ONE ON EACH END.

UPRIGHTS SHALL NOT EXTEND ABOVE THE SIGN PANEL.



Z-BRACKET DETAIL



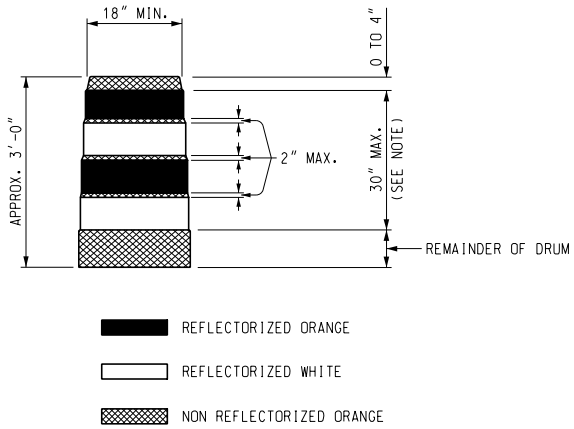
OPTIONAL NYLON WASHER

Other temporary sign supports meeting current NCHRP crash worthy criteria can be found on the FHWA Safety website at http://safety.fhwa.dot.gov/roadway_dept/road_hardware/wzd.htm

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF FIELD SERVICES SPECIAL DETAIL	SPECIAL DETAIL F.H.W.A. APPROVAL	6/16/22 PLAN DATE	WZD-125-E	SHEET 2 OF 3

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



NOTE:
DRUMS SHALL HAVE AT LEAST 4 HORIZONTAL REFLECTORIZED STRIPES (2 ORANGE AND 2 WHITE) OF 6" UNIFORM WIDTH, ALTERNATING IN COLOR WITH THE TOPMOST REFLECTORIZED STRIPE BEING ORANGE. NON REFLECTORIZED SPACES BETWEEN THE HORIZONTAL REFLECTORIZED ORANGE AND WHITE STRIPES SHALL BE ORANGE IN COLOR AND EQUAL IN WIDTH.

PLASTIC DRUM

NOTES:

2" PERFORATED SQUARE STEEL TUBES MAY BE USED TO FABRICATE THE HORIZONTAL BASE OF THE TYPE III BARICADE.

WARNING LIGHTS SHALL BE PLACED ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION AND ALL OTHER PROVISIONS IN THE CONTRACT ON TYPE III BARRICADES.

SEE ROAD STANDARD PLANS R-113-SERIES FOR TEMPORARY CROSSOVERS FOR DIVIDED ROADWAY, AND R-126-SERIES FOR TYPICAL LOCATION AND SPACING OF PLASTIC DRUMS FOR PLACEMENT OF TEMORARY CONCRETE BARRIER.

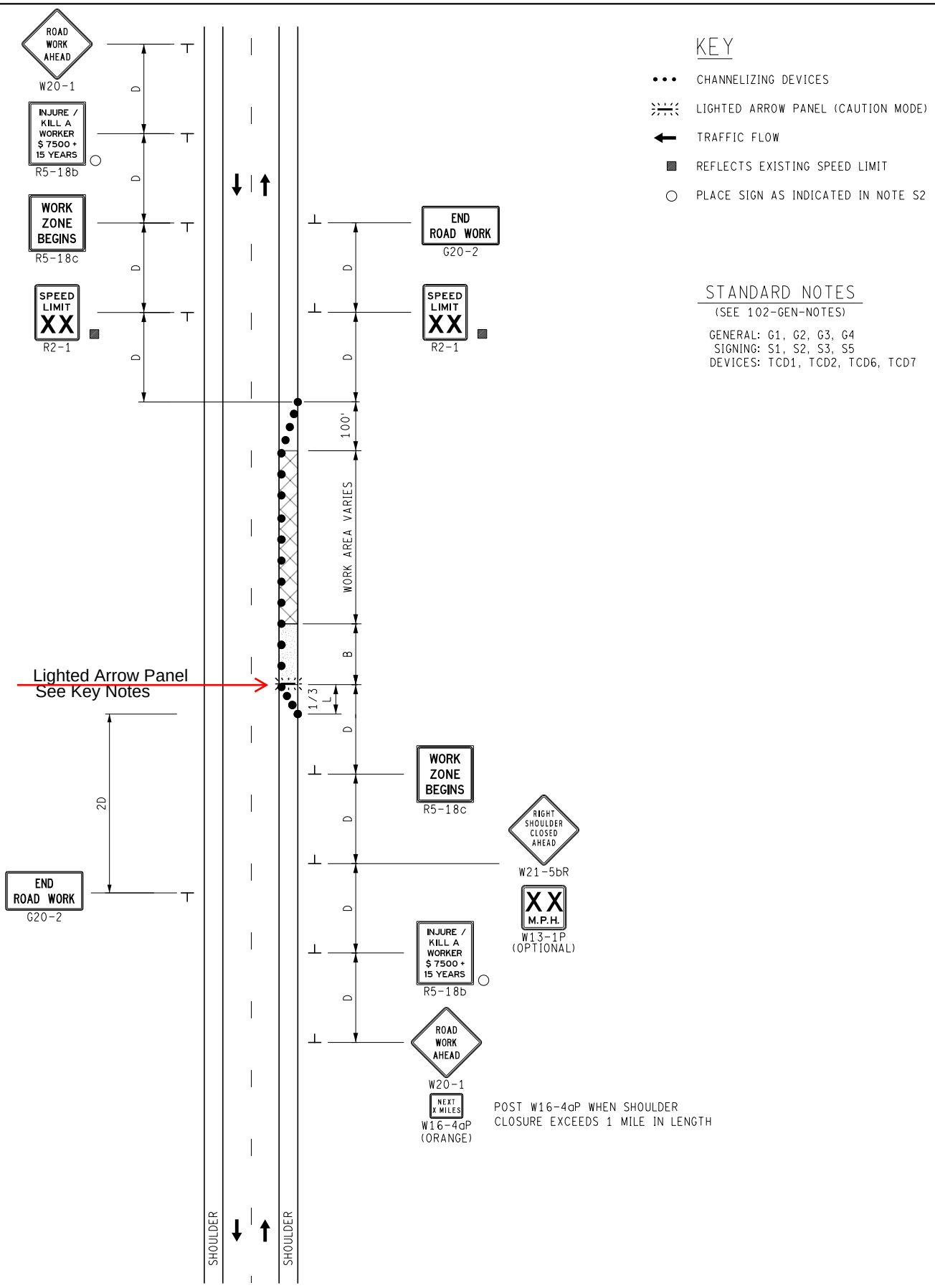
SIGNS, BARRICADES, AND PLASTIC DRUMS SHALL BE FACED WITH PRESSURE-SENSITIVE REFLECTIVE SHEETING ACCORDING TO THE CURRENT STANDARD SPECIFICATIONS FOR CONSTRUCTION.

SANDBAGS SHALL BE USED WHEN SUPPLEMENTAL WEIGHTS ARE REQUIRED TO ACHIEVE STABILITY OF THE BARRICADE. THE SANDBAGS SHALL BE PLACED SO THEY WILL NOT COVER OR OBSTRUCT ANY REFLECTIVE PORTION OF THE TRAFFIC CONTROL DEVICE.

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF FIELD SERVICES SPECIAL DETAIL	(SPECIAL DETAIL) F.H.W.A. APPROVAL	6/16/22 PLAN DATE	WZD-125-E	SHEET 3 OF 3

NOTE: THE ORIGINAL SIGNED COPY IS KEPT ON FILE AT THE MICHIGAN DEPARTMENT OF TRANSPORTATION.



KEY

- CHANNELIZING DEVICES
- LIGHTED ARROW PANEL (CAUTION MODE)
- TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT
- PLACE SIGN AS INDICATED IN NOTE S2

STANDARD NOTES

(SEE 102-GEN-NOTES)

GENERAL: G1, G2, G3, G4
SIGNING: S1, S2, S3, S5
DEVICES: TCD1, TCD2, TCD6, TCD7

POST W16-4aP WHEN SHOULDER CLOSURE EXCEEDS 1 MILE IN LENGTH

MDOT Michigan Department of Transportation	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	SHOULDER CLOSURE ON A 2-LANE, UNDIVIDED ROADWAY	DATE: MAY 2021
		NO: 122-NFW-SHL-(R)		SHEET: 1 OF 1
FILE: 122-NFW-SHL-(R).dgn				

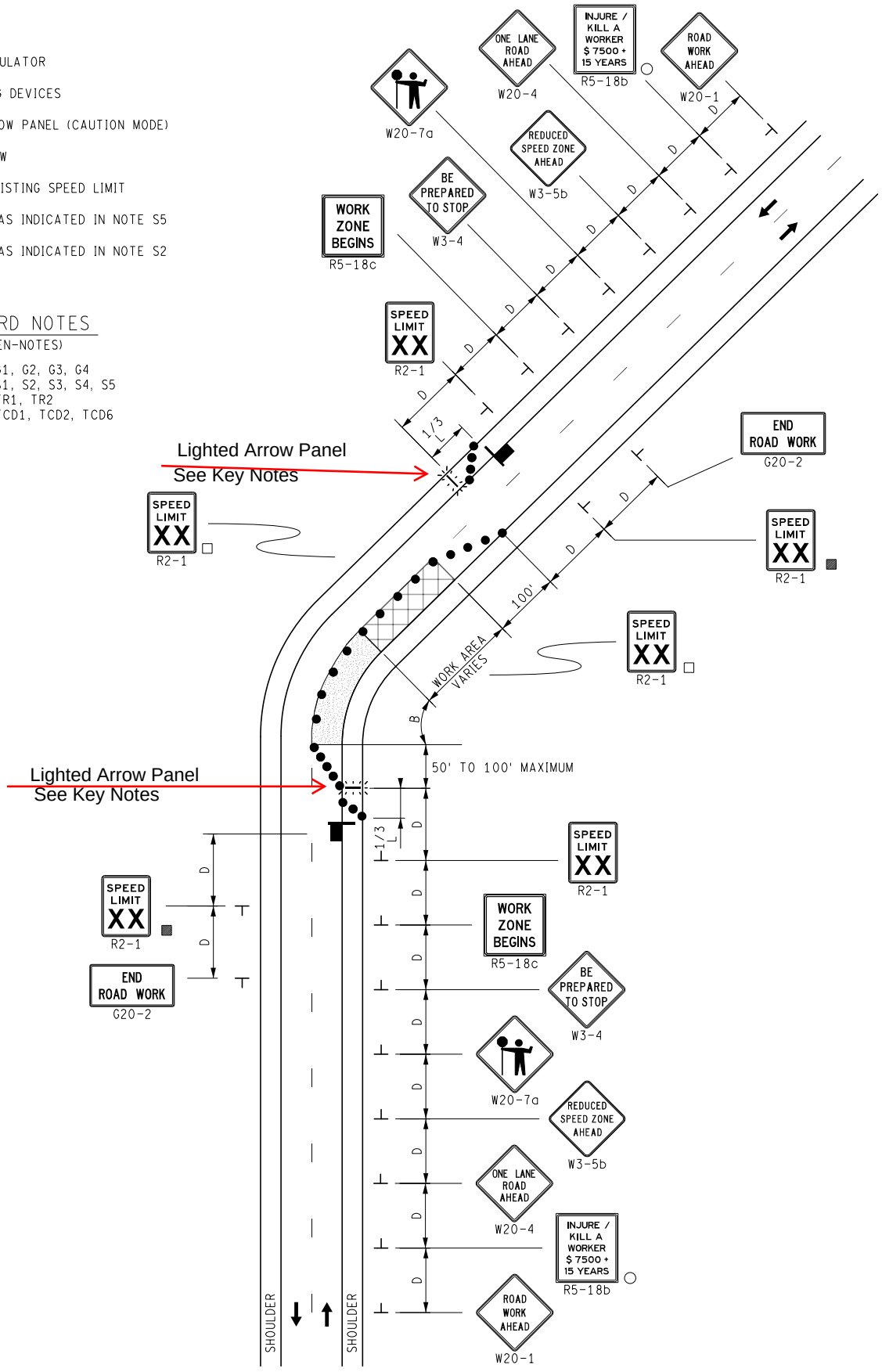
KEY

- TRAFFIC REGULATOR
- CHANNELIZING DEVICES
- LIGHTED ARROW PANEL (CAUTION MODE)
- TRAFFIC FLOW
- REFLECTS EXISTING SPEED LIMIT
- PLACE SIGN AS INDICATED IN NOTE S5
- PLACE SIGN AS INDICATED IN NOTE S2

STANDARD NOTES

(SEE GEN-NOTES)

GENERAL: G1, G2, G3, G4
SIGNING: S1, S2, S3, S4, S5
TRAF REG: TR1, TR2
DEVICES: TCD1, TCD2, TCD6



MDOT Michigan Department of Transportation	NOT TO SCALE	MAINTAINING TRAFFIC TYPICAL	LANE CLOSURE UTILIZING TRAFFIC REGULATORS ON A 2-LANE UNDIVIDED ROADWAY	DATE: MAY 2021
FILE: 110-TR-NFW-2L.dgn		NO: 110-TR-NFW-2L		SHEET: 1 OF 1

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

GENERAL NOTES

G1: SEE GEN-SPACING-CHARTS FOR COMMON VALUES INCLUDING:
D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
L = MINIMUM LENGTH OF TAPER
B = LENGTH OF LONGITUDINAL BUFFER
ROLL AHEAD DISTANCE

G2: DISTANCE BETWEEN SIGNS, "D", THE VALUES FOR WHICH ARE SHOWN IN TYPICAL GEN-KEY ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.

G3: ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING MUST MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350) TEST LEVEL 3, OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) TL-3 AS WELL AS THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS. ONLY DESIGNS AND MATERIALS APPROVED BY MDOT WILL BE ALLOWED.

G4: DO NOT STORE EQUIPMENT, MATERIALS OR PERFORM WORK IN ESTABLISHED BUFFER AREAS.

G5: ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERN. EXCEPTION WILL BE MADE FOR TRAFFIC PATTERNS FOR WORK LESS THAN THREE DAYS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

SIGN NOTES

S1: ALL NON-APPLICABLE SIGNING WITHIN THE CIA MUST BE MODIFIED TO FIT CONDITIONS, COVERED, OR REMOVED. FOR GUIDANCE SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, SECTIONS 6.01.09 AND 6.01.10.

S2: R5-18b SIGNS ARE ONLY REQUIRED ON FREEWAY PROJECTS WITH A DURATION OF 15 DAYS OR LONGER OR NON-FREEWAY PROJECTS WITH A DURATION OF 90 DAYS OR LONGER. TO APPLY THIS TYPICAL WITHOUT R5-18b SIGNS, REMOVE THE SIGNS AND CONSOLIDATE THE SEQUENCE AS APPROPRIATE.

S3: R5-18c IS ONLY REQUIRED IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. OMIT THIS SIGN IN SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE.

S4: ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE W20-5 SIGNS.

S5: PLACE ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE WORK ZONE SPEED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK ZONE, OR AFTER EACH ENTRANCE RAMP THAT COMES ONTO THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT. PLACE ADDITIONAL SPEED LIMIT SIGNS AT INTERVALS ALONG THE ROADWAY SUCH THAT NO SPEED LIMIT SIGNS ARE MORE THAN 2 MILES APART. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, PLACE ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED BEYOND THE LIMITS OF THE WORK AREA AS INDICATED. IF PERMANENT SIGNS DISPLAYING THE CORRECT SPEED LIMIT ARE POSTED, OMIT ALL W3-5b AND R2-1 SIGNS AND REDUCE SPACING ACCORDINGLY.

S6: FABRICATE SPECIAL SIGNS IN ACCORDANCE WITH CURRENT SIGNING DESIGN STANDARDS.

S7: PLACE ADDITIONAL R8-3 SIGNS AT A MAXIMUM 500' SPACING THROUGHOUT THE WORK ZONE.

S8: WHEN SPEED LIMIT SIGNS CANNOT BE PLACED SIDE BY SIDE AS SHOWN, PLACE THEM "D" DISTANCE APART.

S9: STOP SIGNS NOT REQUIRED IF SIGNALS ARE ON 4-WAY FLASHING RED. STOP AHEAD SIGNS ARE NOT REQUIRED IF THERE IS ADEQUATE VISIBILITY OF THE STOP SIGN OR IF SIGNALS ARE BEING USED TO CONTROL TRAFFIC.

S10: PLACE REDUCED SPEED ZONE AHEAD SIGN (W3-5b) HERE WHEN USING A SPEED REDUCTION IN THIS DIRECTION.

S11: THE NUMBER OF W1-6 SHIFT SIGNS TO PLACE FOR A SHIFT IS AS FOLLOWS:
SHIFTS 4FT OR LESS, PLACE ONE W1-6(R)(L)
SHIFTS 5FT TO 12FT, PLACE TWO W1-6(R)(L)
SHIFTS MORE THAN 12FT, PLACE THREE OR MORE W1-6(R)(L) SIGNS DEPENDING UPON LENGTH OF SHIFT AND AS PER THE ENGINEER.

S12: PLACE R2-1 SIGNS AS DETAILED IN NOTE S5 WHEN THERE IS A SPEED REDUCTION IN THIS DIRECTION

TRAFFIC REGULATOR NOTES

TR1: TRAFFIC REGULATORS MUST FOLLOW ALL THE REQUIREMENTS IN THE STANDARD SPECIFICATIONS, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, THE CURRENT VERSIONS OF THE TRAFFIC REGULATOR'S INSTRUCTION MANUAL AND THE VIDEO "HOW TO SAFELY REGULATE TRAFFIC IN MICHIGAN". THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS IS DETERMINED BY THE ROADWAY ADT, GEOMETRICS, AND AS DIRECTED BY THE ENGINEER.

TR2: PROVIDE APPROPRIATE BALLOON LIGHTING TO SUFFICIENTLY ILLUMINATE TRAFFIC REGULATOR'S STATIONS WHEN TRAFFIC REGULATING IS ALLOWED DURING THE HOURS OF DARKNESS.

TEMPORARY TRAFFIC CONTROL DEVICE NOTES

TCD1: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD NOT EXCEED 1.0 TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 50 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TAPERS ARE NOT TO EXCEED 25 FEET AT NIGHT.

TCD2: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TANGENT SHOULD NOT EXCEED TWICE THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 100 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICE TANGENTS ARE NOT TO EXCEED 50 FEET AT NIGHT.

TCD3: TYPE III BARRICADES MUST BE LIGHTED FOR OVERNIGHT CLOSURES.

TCD4: WHEN THE HAUL ROAD IS NOT IN USE, PLACE LIGHTED TYPE III BARRICADES WITH "ROAD CLOSED" EXTENDING COMPLETELY ACROSS THE HAUL ROAD.

TCD5: USE VERTICAL PANELS IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER (R-53, AND R-126) WHEN USED WITH A TEMPORARY SIGNAL SYSTEM.

TCD6: PLACE LIGHTED ARROW PANELS AS CLOSE TO THE BEGINNING OF TAPERS AS PRACTICAL, BUT NOT IN A MANNER THAT WILL OBSCURE OR CONFUSE APPROACHING MOTORISTS WHEN PHYSICAL LIMITATIONS RESTRICT PLACEMENT. IN CURBED SECTIONS, IF ARROW BOARD CANNOT BE PLACED BEHIND CURB, PLACE ARROW BOARD IN THE CLOSED LANE AS CLOSE TO THE BEGINNING OF TAPER AS POSSIBLE.

TCD7: ADDITIONAL TYPE III BARRICADES MAY BE REQUIRED TO COMPLETELY CLOSE OFF ROAD FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.

TCD8: WHERE THE SHIFTED SECTION IS SHORTER THAN 600 FEET, A DOUBLE REVERSE CURVE SIGN (W24-1) CAN BE USED INSTEAD OF THE FIRST REVERSE CURVE SIGN, AND THE SECOND REVERSE CURVE SIGN CAN BE OMITTED.

TCD9: RUMBLE STRIPS ARE TO BE PLACED AS SPECIFIED IN THE CONTRACT. IF NOT SPECIFIED IN THE CONTRACT, PLACE RUMBLE STRIPS AS SHOWN, AND IN ACCORDANCE WITH THE RUMBLE STRIP MANUFACTURER'S RECOMMENDATIONS. AN ARRAY OF RUMBLE STRIPS CONTAINS THREE RUMBLE STRIPS. PLACE THE RUMBLE STRIPS IN THE ARRAY AT A CONSISTENT DISTANCE, BETWEEN 10' AND 20' APART.

TCD10: SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, PORTABLE CHANGEABLE MESSAGE SIGN GUIDELINES FOR RECCOMENDED AND CORRECT PCMS MESSAGING. STAGGER PCMS THAT ARE ON OPPOSING SIDES OF THE ROAD 1000 FEET FROM EACH OTHER.

RAMP NOTES

RMP1: WHEN CONDITIONS ALLOW, E5-1 SIGNS MUST BE REMOVED OR COVERED AND CHANELIZING DEVICES MUST BE POSITIONED TO ENABLE RAMP TRAFFIC TO DIVERGE IN A FREE MANNER

RMP2: STOP AND YIELD CONDITIONS SHOULD BE AVOIDED WHENEVER PRACTICAL. WHEN CONDITIONS WARRANT, R1-1 SIGNS MAY BE USED IN PLACE OF R1-2 SIGNS. WHEN R-1 SIGNS ARE USED, W3-1 SIGNS MUST BE USED IN PLACE OF W3-2 SIGNS. CONSIDERATION SHOULD BE GIVEN TO CLOSING THE RAMP TO COMPLETE WORK TO ALLOW AN ADEQUATE MERGE DISTANCE. WORK SHOULD BE EXPEDITED TO AVOID THE STOP AND/OR YIELD CONDITIONS.

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

SIGNAL NOTES

SIG1: EXISTING SIGNAL MUST BE EITHER 4-WAY FLASHING RED, BAGGED, OR TURNED OFF.

SIG2: SIGNAL IS IN OPERATION.

SIG3: DELINEATE THE WORK ZONE AREA WITH 28 INCH CONES FOR DAYTIME WORK, OR 42 INCH CHANNELIZING DEVICES FOR NIGHTTIME WORK.

SIG4: THE CONTRACTOR MUST HAVE A DESIGNATED SPOTTER IF THE AERIAL BUCKET TRUCK IS LOCATED OVER ACTIVE TRAVEL LANES.

SIG5: THE LOWEST POINT OF THE BUCKET MAY NOT TRAVEL BELOW 14 FOOT VERTICAL CLEARANCE. THE CONTRACTOR MUST UTILIZE AN ALTERNATE SET UP, OR PLACE THE INTERSECTION IN A 4 WAY STOP IF THE 14 FOOT VERTICAL CLEARANCE IS COMPROMIZED. USE TRAFFIC REGULATORS TO CONTROL TRAFFIC THROUGH THE INTERSECTION WHEN TRAFFIC IS PLACED IN A 4 WAY STOP.

SIG6: DELINEATE THE TRUCK WITH CHANNELIZING DEVICES. THE POSITION OF THE TRUCK MAY BE MOVED TO FACILITATE WORK.

MAINTENANCE AND SURVEYING NOTES

MS1: WHENEVER STOPPING SIGHT DISTANCE EXISTS TO THE REAR, THE SHADOW VEHICLES SHOULD MAINTAIN THE RECOMENDED DISTANCE FROM THE WORK AREA AND PROCEEED AT THE SAME SPEED. THE SHADOW VEHICLE SHOULD SLOW DOWN AND TRAVEL AT A FARTHER DISTANCE TO PROVIDE ADEQUATE SIGHT DISTANCE IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES.

MS2: WORKERS OUTSIDE OF VEHICLES SHOULD WORK WITHIN 150' OF WORK VEHICLES WITH AN ACTIVATED BEACON, BETWEEN THE "BEGIN WORK CONVOY" SIGN AND THE "END WORK CONVOY" SIGN, OR BETWEEN THE "WORK ZONE BEGINS" AND "END ROAD WORK" SIGN.

MS3: WORK OR SHADOW VEHICLES WITH OR WITHOUT A TMA MAY BE USED TO SEPARATE THE WORK SPACE FROM TRAFFIC. IF USED, THE VEHICLES SHOULD BE PARKED ACCORDING TO THE ROLL AHEAD DISTANCE TABLES.

MS4: WORK AND SHADOW VEHICLES SHALL BE APPROPRIATELY EQUIPPED WITH AN ACTIVATED AMBER BEACON.

MS5: WHEN WORKERS ARE OUTSIDE THEIR VEHICLES IN AN EXISTING LANE WHILE A MOBILE OPERATION IS OCCURRING DURING THE NIGHTTIME HOURS, CHANNELIZING DEVICES TO DELINEATE OPEN OR CLOSED LANES AT 50 FT SPACING MUST BE USED. AN EXAMPLE OF AN OPERATION (BUT NOT LIMITED TO) IS THE LAYOUT OF CONCRETE PATCHES.

MS6: W21-6 AND W20-1 SIGNS MAY BE SUBSTITUTED AS DETERMINED BY THE TYPE OF WORK TAKING PLACE AS PER THE ENGINEER.

DISTANCE BETWEEN TRAFFIC SIGNS, "D"

"D" DISTANCES	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
D (FEET)	250	300	350	400	450	500	550	600	650	700	750

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"

"B" LENGTHS	SPEED,* MPH (PRIOR TO WORK AREA)											
	20	25	30	35	40	45	50	55	60	65	70	75
B (FEET)	33	50	83	132	181	230	279	329	411	476	542	625

* POSTED SPEED, OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

MINIMUM MERGING TAPER LENGTH, "L" (FEET)

OFFSET (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
1	11	15	21	27	45	50	55	60	65	70	75
2	21	30	41	54	90	100	110	120	130	140	150
3	32	45	62	80	135	150	165	180	195	210	225
4	42	60	82	107	180	200	220	240	260	280	300
5	53	75	103	134	225	250	275	300	325	350	375
6	63	90	123	160	270	300	330	360	390	420	450
7	73	105	143	187	315	350	385	420	455	490	525
8	84	120	164	214	360	400	440	480	520	560	600
9	94	135	184	240	405	450	495	540	585	630	675
10	105	150	205	267	450	500	550	600	650	700	750
11	115	165	225	294	495	550	605	660	715	770	825
12	125	180	245	320	540	600	660	720	780	840	900
13	136	195	266	347	585	650	715	780	845	910	975
14	146	210	286	374	630	700	770	840	910	980	1050
15	157	225	307	400	675	750	825	900	975	1050	1125

NOT TO SCALE

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

$"L" = \frac{W \times S^2}{60}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = W X S WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER
S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
W = WIDTH OF OFFSET

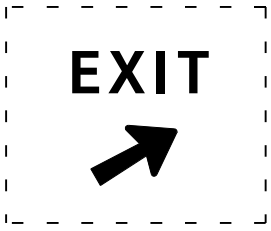
TYPES OF TAPERS	TAPER LENGTH
UPSTREAM TAPERS	
MERGING TAPER	L - MINIMUM
SHIFTING TAPER	1/2 L - MINIMUM
SHOULDER TAPER	1/3 L - MINIMUM
2 TO 1 LANE ROAD TAPER	100' - MAXIMUM
DOWNSTREAM TAPERS	
(USE IS RECOMMENDED)	100' (PER LANE)

MAXIMUM SPACING FOR CHANNELIZING DEVICES

WORK ZONE SPEED LIMIT	DRUM AND 42" DEVICE SPACING (FT)		NIGHTTIME 42" DEVICE SPACING (FT)	
	TAPER	TANGENT	TAPER	TANGENT
< 45 MPH	1 x SPEED LIMIT	2 x SPEED LIMIT	25 FEET	50 FEET
≥ 45 MPH	50 FEET	100 FEET	25 FEET	50 FEET

SIGN OUTLINE KEY

DASHED OUTLINES INDICATE A SIGN THAT EXISTS ON SITE, AND NEEDS TO BE COVERED.



SOLID OUTLINES INDICATE A SIGN THAT IS TO BE PLACED ON THE PROJECT

NOT TO SCALE

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES - TEST LEVEL 2

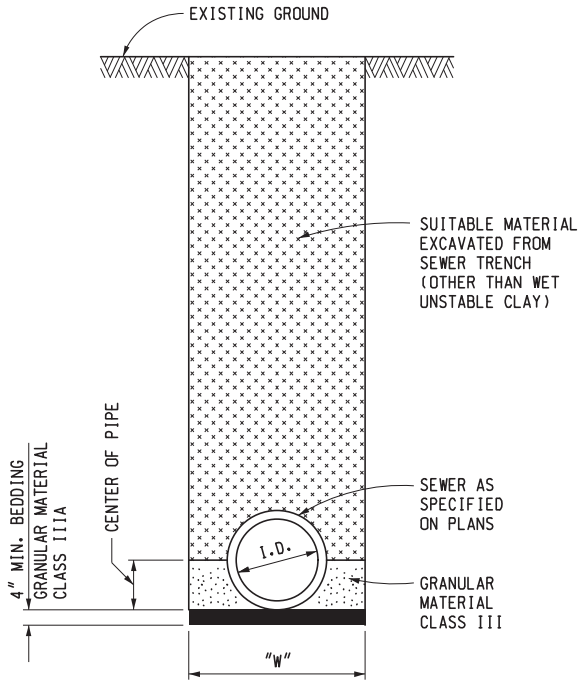
WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5.5 TONS (STATIONARY)	40 MPH OR LESS	25 FT

* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 4,410 POUND IMPACT VEHICLE WEIGHT.

GUIDELINES FOR ROLL-AHEAD DISTANCES FOR TMA VEHICLES - TEST LEVEL 3

WEIGHT OF TMA VEHICLE	PREVAILING SPEED (POSTED SPEED PRIOR TO WORK ZONE)	ROLL-AHEAD DISTANCE* (DISTANCE FROM FRONT OF TMA VEHICLE TO WORK AREA)
5 TONS (MOBILE)	45 MPH	100 FT
	50-55 MPH	150 FT
	60-75 MPH	175 FT
12 TONS (STATIONARY)	45 MPH	25 FT
	50-55 MPH	25 FT
	60-75 MPH	50 FT

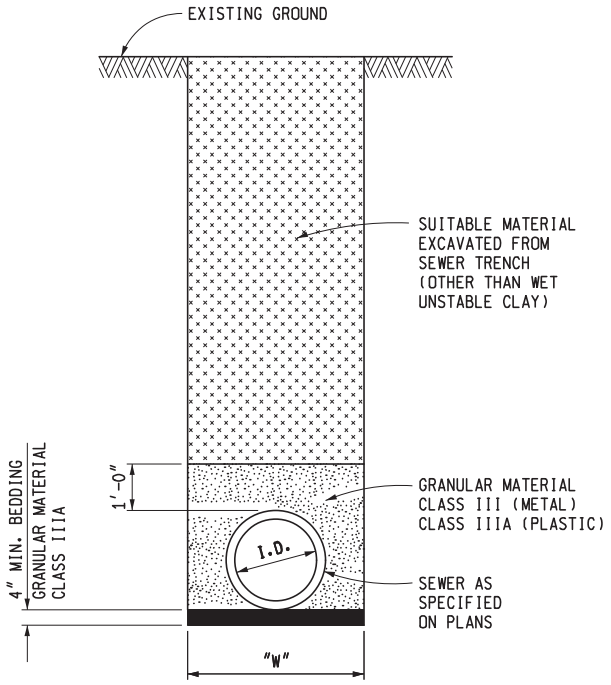
* ROLL-AHEAD DISTANCES ARE CALCULATED USING A 10,000 POUND IMPACT VEHICLE WEIGHT.



SEWER NOT UNDER ROADBED
CONCRETE

NOTE: FOR "W" SEE NOTES ON SHEET 5

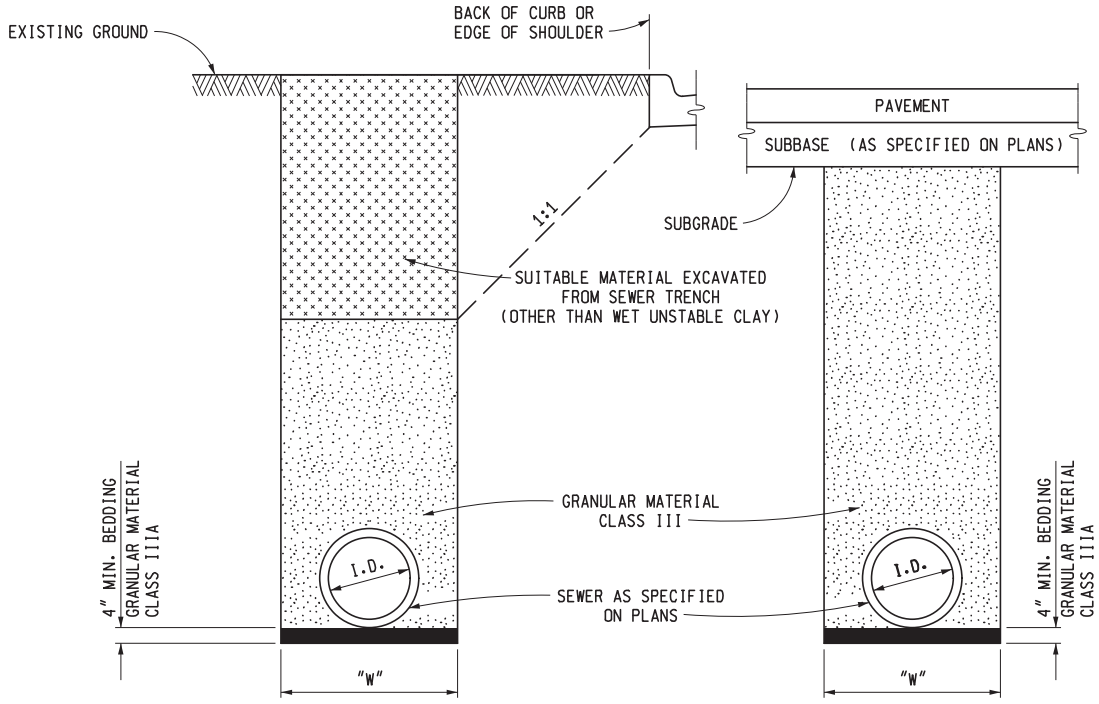
A1



SEWER NOT UNDER ROADBED
METAL & PLASTIC

NOTE: FOR "W" SEE NOTES ON SHEET 5

A2



SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED
CONCRETE & METAL PIPE

B1

MDOT Michigan Department of Transportation

PREPARED BY DESIGN DIVISION

DRAWN BY: B.L.T.

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR
Kirk T. Steudle

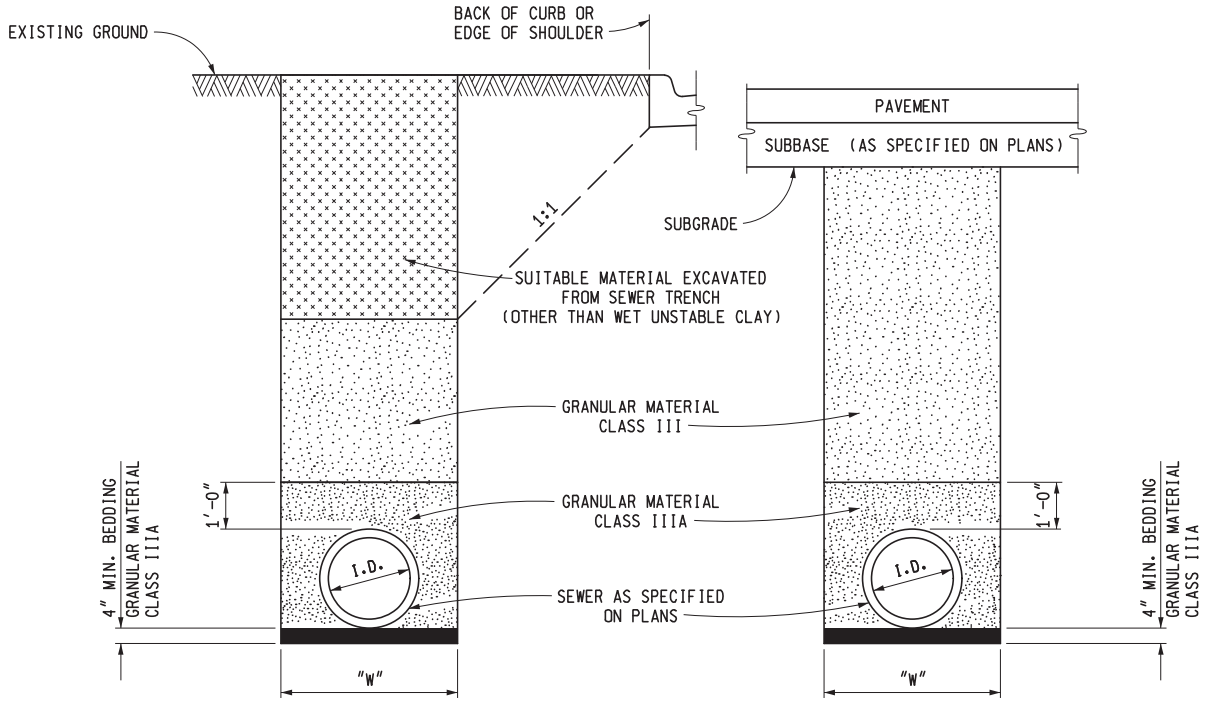
APPROVED BY: Kimberly Avery
Digitally signed by Kimberly Avery
DN: cn=Kimberly Avery, o=MDOT, ou=Bureau of Field Services, email=averyk@michigan.gov, c=US
Date: 2016.12.15 09:03:17 -05'00'
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: Bradley C. Wieferich
Digitally signed by Bradley C. Wieferich
DN: cn=Bradley C. Wieferich, o=Michigan Department of Transportation, ou=Design Division, email=wieferichb@michigan.gov, c=US
Date: 2016.12.10 09:45:44 -05'00'
DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

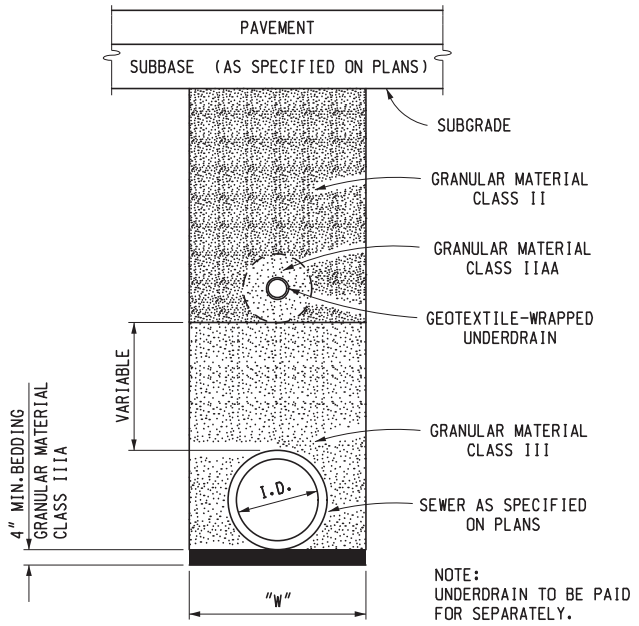
7-25-2017	2-8-2016	R-83-C	SHEET 1 OF 5
F.H.W.A. APPROVAL	PLAN DATE		



SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED

PLASTIC PIPE

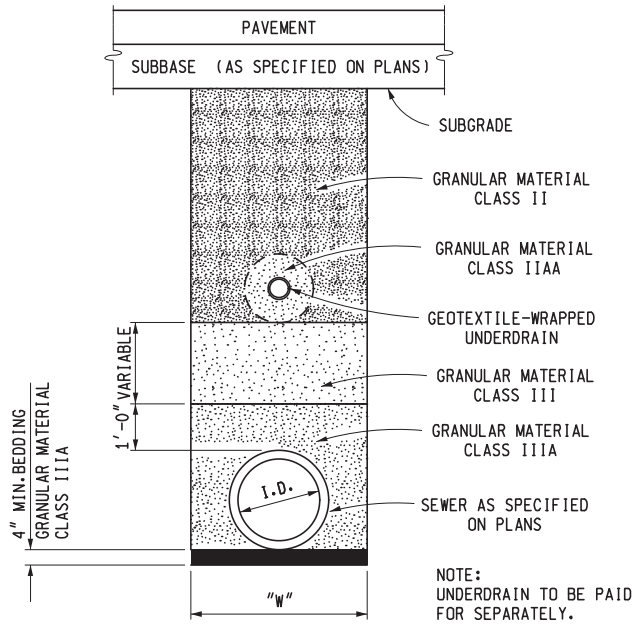
B2



SEWER WITH UNDERDRAIN UNDER ROADBED

CONCRETE & METAL PIPE

C1



SEWER WITH UNDERDRAIN UNDER ROADBED

PLASTIC PIPE

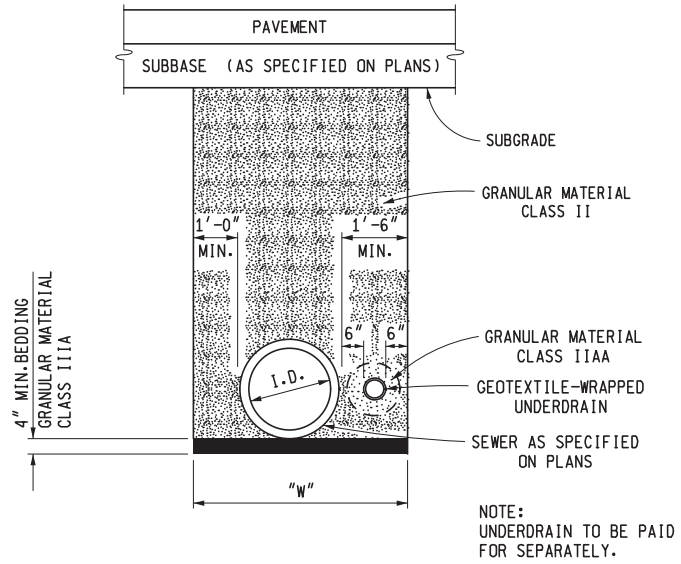
C2

MICHIGAN DEPARTMENT OF TRANSPORTATION

BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

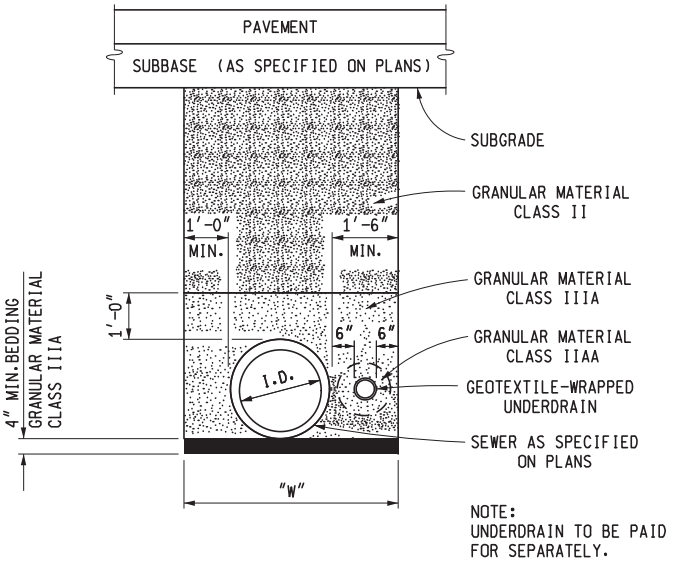
7-25-2017 F.H.W.A. APPROVAL	2-8-2016 PLAN DATE	R-83-C	SHEET 2 OF 5



SEWER WITH UNDERDRAIN UNDER ROADBED

CONCRETE & METAL PIPE
(FOR SHALLOW SEWERS)

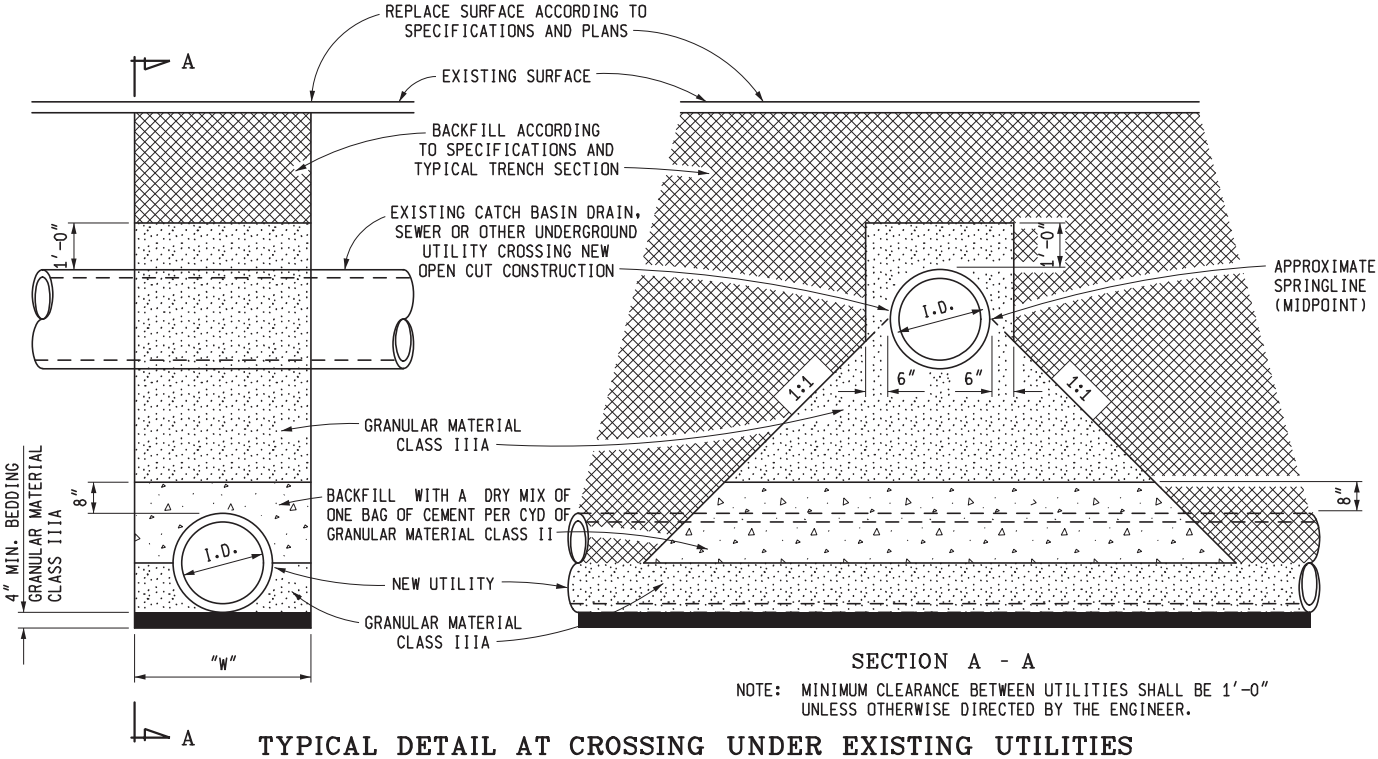
D1



SEWER WITH UNDERDRAIN UNDER ROADBED

PLASTIC PIPE
(FOR SHALLOW SEWERS)

D2



SECTION A - A

NOTE: MINIMUM CLEARANCE BETWEEN UTILITIES SHALL BE 1'-0" UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TYPICAL DETAIL AT CROSSING UNDER EXISTING UTILITIES

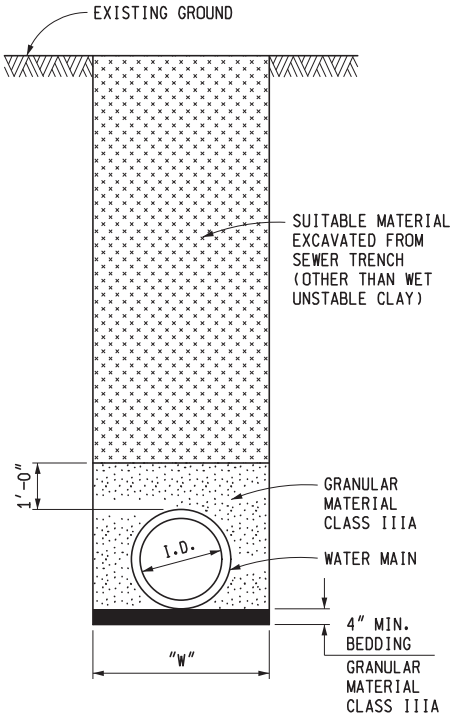
PAYMENT FOR THIS TRENCH DETAIL WILL BE INCLUDED WITH THE ADJACENT TRENCH DETAILS

E

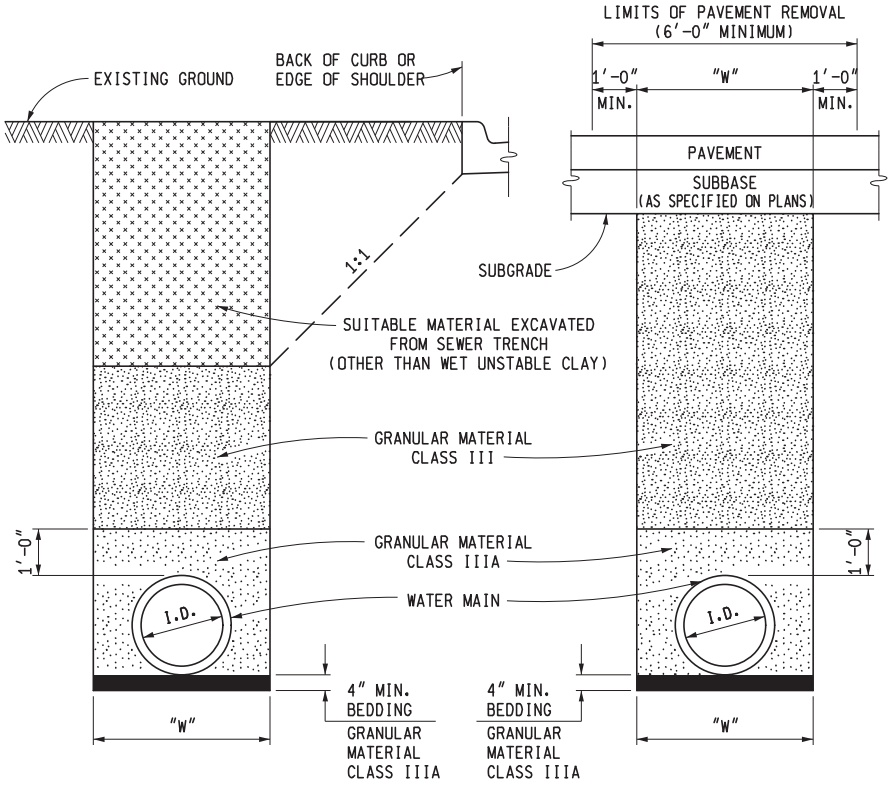
MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

7-25-2017 F.H.W.A. APPROVAL	2-8-2016 PLAN DATE	R-83-C	SHEET 3 OF 5

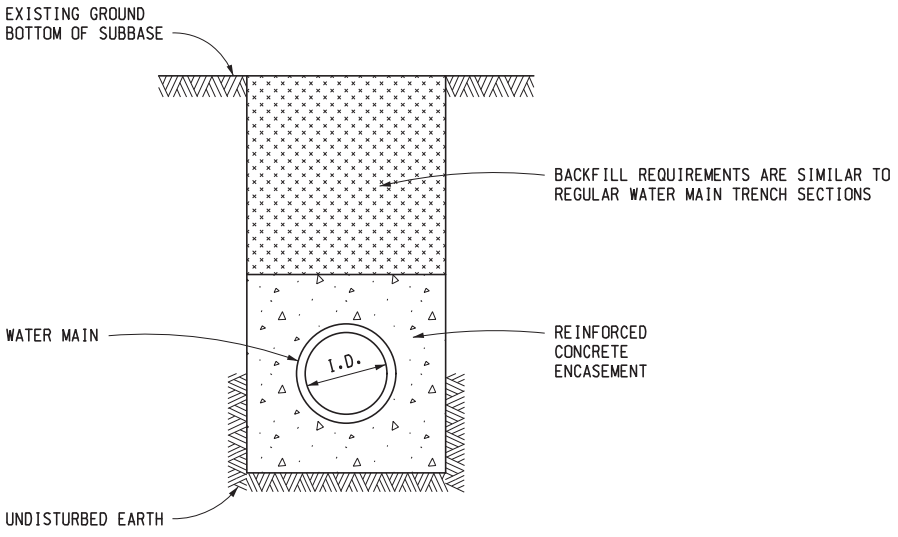


WATER MAINS NOT UNDER ROADBED F



NOTE: WHEN WATER MAIN IS PLACED IN PROPOSED ROADBED AREA, IT SHALL BE BACKFILLED WITH SELECTED EXCAVATION MATERIAL ABOVE FUTURE SUBGRADE TO EXISTING GROUND LINE.

WATER MAINS UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED G



REQUIRED ENCASEMENT SIZE FOR RESPECTIVE PIPE SIZES	
DIAMETER OF PIPE	ENCASEMENT SIZE AND TRENCH WIDTH
6" - 12"	3'-0"
16"	3'-6"
24"	4'-6"
30"	5'-0"
36"	5'-6"
42"	6'-0"
48"	7'-0"
54"	7'-6"
60"	8'-0"
66"	8'-6"
72"	9'-0"

NOTE:
REINFORCEMENT SHALL BE AS SPECIFIED ON PLANS.

WATER MAINS IN REINFORCED CONCRETE ENCASEMENT H

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

7-25-2017 F.H.W.A. APPROVAL	2-8-2016 PLAN DATE	R-83-C	SHEET 4 OF 5

NOTES:

BACKFILLING SHALL BE ACCORDING TO THE STANDARD SPECIFICATION.

SUFFICIENT TRENCH WIDTH SHALL BE PROVIDED TO ALLOW FREE WORKING SPACE AND TO PERMIT COMPACTING THE BACKFILL AROUND THE PIPE.

THE FOLLOWING ARE MINIMUM TRENCH WIDTHS:

I.D. PIPE SIZE (INCHES)	LESS THAN 18	21	24	30	36
"W" TRENCH WIDTH (FEET)	3.0	3.5	4.0	5.0	6.0

I.D. PIPE SIZE (INCHES)	42	48	54	60	66	72
"W" TRENCH WIDTH (FEET)	7.0	8.0	9.5	10.0	10.5	11.0

I.D. PIPE SIZE (INCHES)	78	84	90	96	102	108
"W" TRENCH WIDTH (FEET)	11.5	12.0	12.5	13.0	13.5	14.0

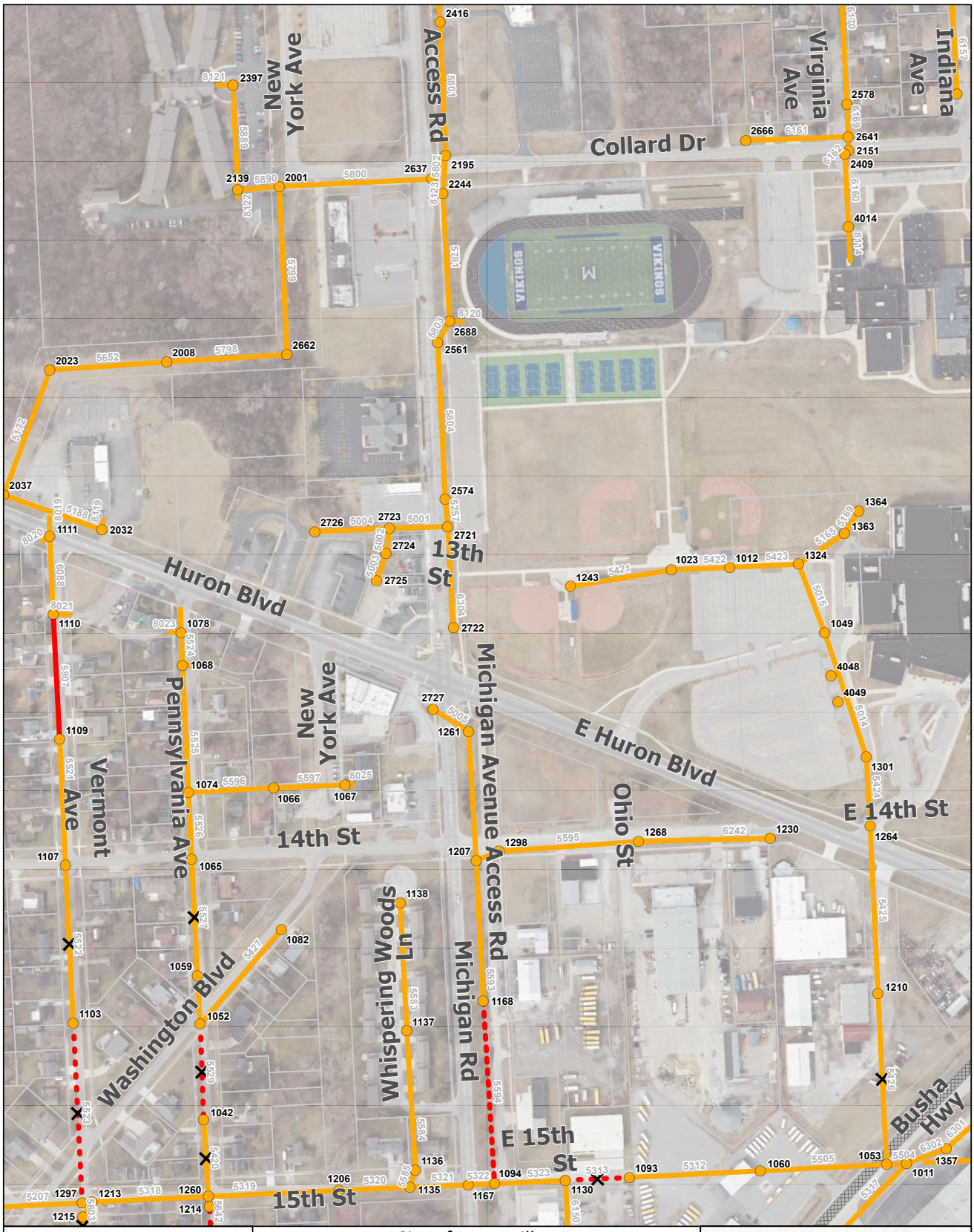
ESTIMATED PAVEMENT REMOVAL WIDTH IS TO BE TRENCH WIDTH "W" PLUS 1'-0" EACH SIDE OF THE TRENCH (6'-0" MINIMUM).

MICHIGAN DEPARTMENT OF TRANSPORTATION

BUREAU OF DEVELOPMENT STANDARD PLAN FOR

UTILITY TRENCHES

7-25-2017 F.H.W.A. APPROVAL	2-8-2016 PLAN DATE	R-83-C	SHEET 5 OF 5



	City of Marysville - Sanitary Sewer Improvements Sectional Maps	
Job No. 20250698	Date February 2026	Sheet No. 15

Legend

- Pipe Joint Grouting
- Sectional Lining + Pipe Joint Grouting
- Full Length Lining + Pipe Joint Grouting
- Sectional Lining
- Full Length Lining
- No Rehab
- Sanitary Manholes
- Major Roads
- Parcels
- Railroads

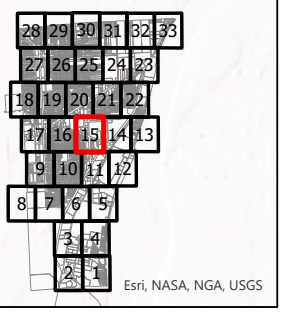
Note: All roads not denoted as Major are considered Minor Roads.

N W E S

0 50 100 200 Feet

Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx



MARYSVILLE

HRC

City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	33

N W E S

0 50 100 200 Feet

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Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

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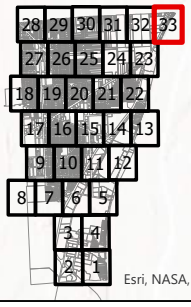

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City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	3

N W E S

0 50 100 200 Feet

Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

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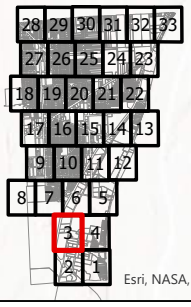

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City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	6

N W E S

0 50 100 200 Feet

Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

Legend

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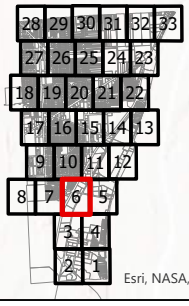

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City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	1

N W E S

0 50 100 200 Feet

Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

Legend

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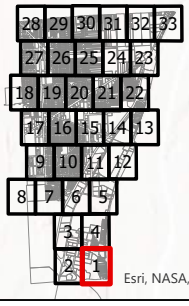

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City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	2

0 50 100 200 Feet

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Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

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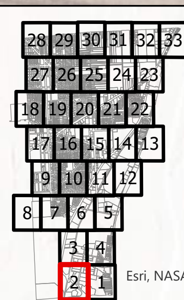
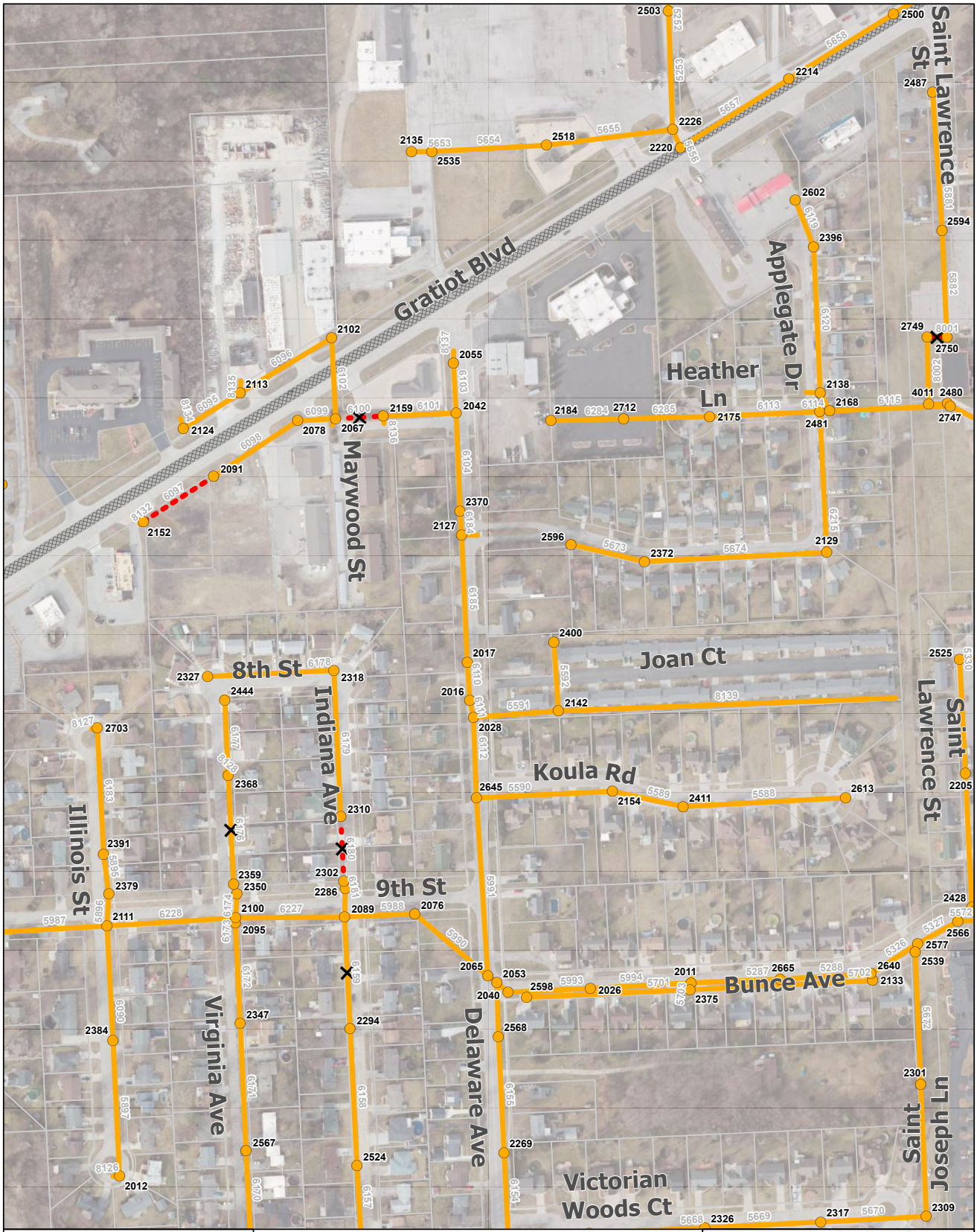
- Parcels
- Railroads

Note: All roads not denoted as Major are considered Minor Roads.



Esri, NASA, NGA, USGS, FEMA



City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	21

Legend

- Pipe Joint Grouting
- Sectional Lining + Pipe Joint Grouting
- Full Length Lining + Pipe Joint Grouting
- Sectional Lining
- Full Length Lining
- No Rehab
- Sanitary Manholes
- Major Roads
- Parcels
- Railroads

Note: All roads not denoted as Major are considered Minor Roads.

Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

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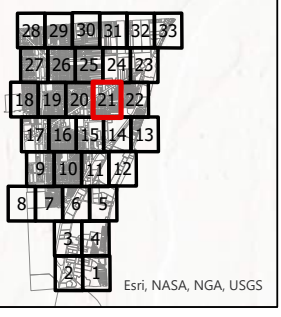


City of Marysville - Sanitary Sewer Improvements Sectional Maps

Job No.	Date	Sheet No.
20250698	February 2026	23

0 50 100 200 Feet

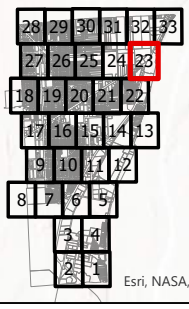
Note: Unless otherwise noted, prescribed sewer easements are 10-feet on either side of sewer

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

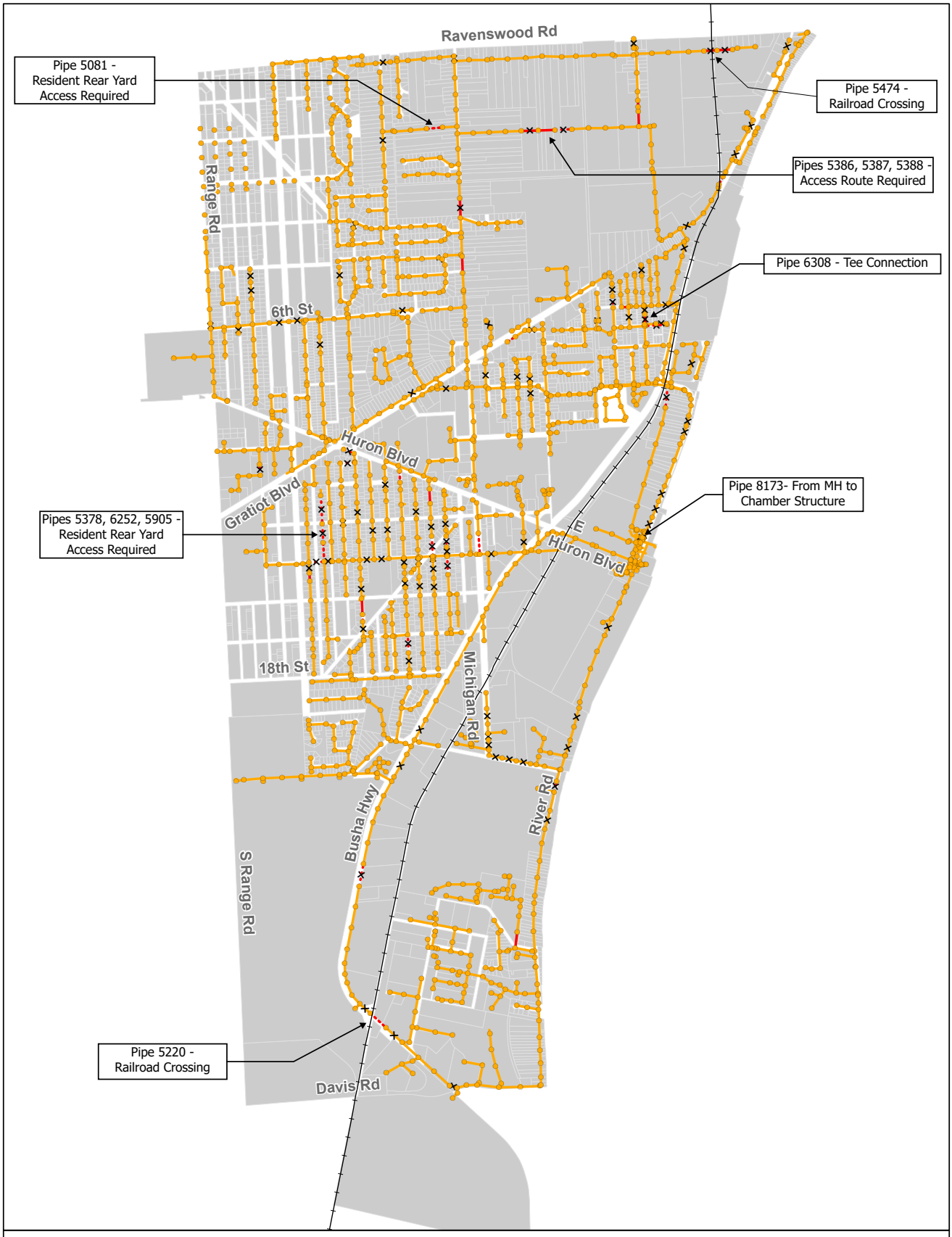
Legend

- Pipe Joint Grouting
- Sectional Lining + Pipe Joint Grouting
- Full Length Lining + Pipe Joint Grouting
- Sectional Lining
- Full Length Lining
- No Rehab
- Sanitary Manholes
- Major Roads
- Parcels
- Railroads

Note: All roads not denoted as Major are considered Minor Roads.



Esri, NASA, NGA, USGS



City of Marysville - Sanitary Sewer Improvements Overview Map

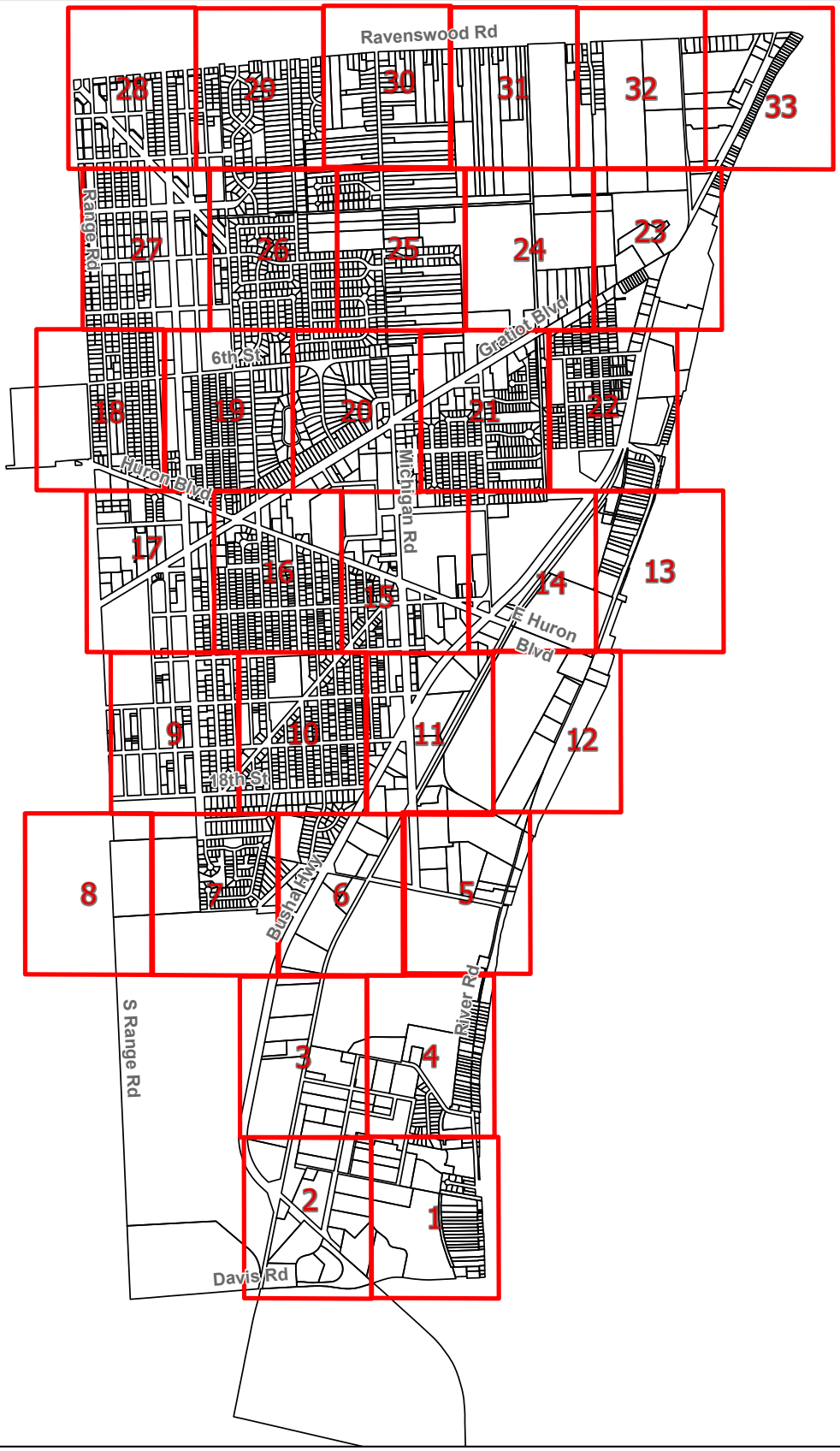
N
W E
S
0 500 1,000 2,000 Feet

Legend

- Pipe Joint Grouting
- Sectional Lining
- Sanitary Manholes
- Sectional Lining + Pipe Joint Grouting
- Full Length Lining
- Parcels
- Full Length Lining + Pipe Joint Grouting
- No Rehab
- Railroads

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

Job No.	Date	Figure No.
20250698	February 2026	



City of Marysville - Sanitary Sewer Improvements Sectional Maps

N
W E
S
0 500 1,000 2,000
Feet

Legend

Map Locations

Parcels

Path: Y:\202506\20250698\03_Studies\Working\GIS_Pro\20250908_Marysville_EPA_Grant.aprx

Job No.	Date	Figure No
20250698	February 2026	

Permitting

Information Packet

Version 4.0
February 2026

Permitting

Table of Contents

Introduction

Utility Permitting

CSX property encompassing 26 states, the District of Columbia and a portion of eastern Canada (see appendix for system map) and is responsible for the review and approval of all requests for facility encroachments and permits for rights of entry. Three key service roles include:

- **Customer Accounts: permit requests; permit/contract negotiations**
- **Engineering: review/approval of permit facility design plans**
- **Construction: scheduling of permitted facility installations**

Contact Us

For questions concerning the permitting process, please first reference CSX's new CoPilot chatbot featured on the Real Estate section of our website. This AI-powered chatbot "Chessie" is designed to provide quick answers to your questions.

For specific utility permitting questions that require additional support beyond what is provided in this Information Packet or the Chatbot, please refernce the Contacts by Territory link. Other questions involving CSX:

- **General Email inquiries: www.csx.com;**
  - **Select: About Us**
  - **Select: Contact Us**
  - **Select: Category of your choice in the TellCSX form field**

- **Headquarters:**
  CSX Transportation, Inc.
  500 Water Street
  Jacksonville, FL 32202

- **Utility Permitting:**
  CSX Transportation, Inc.
  500 Water Street
  Jacksonville, FL 32202
  Attn: Utility Permitting (J180)

To report a railroad emergency, please contact the CSX Public Safety Coordination Center at 1-800-232-0144 immediately.

Summary of Services

Encroachments

Typical encroachments reviewed by CSX on a case-by-case basis include:

- **Wirelines (electric, fiber, cable, etc.)**
- **Pipelines (water, sewer, gas, culverts, etc.)**
- **Towers (cellular/co-location)**
- **Right of Entry (Temporary)**
  - **Access (surveys, soil borings, inspections, oversized equipment, etc.)**
  - **Environmental (soil sampling, monitoring wells, remediation, etc.)**

Upon review and approval of the project proposal, CSX will prepare an agreement to document access to the railroad property for the approved project. See "Submitting a Request" for additional information on how to facilitate review and approval of the project.

Facilities that should be designed to be located off the CSX system due to negative impact on railroad operations include:

- **Manholes**
- **Catch Basins**
- **Headwalls**

For any encroachment request not referenced above, please contact CSX (see *Contact Us*) to discuss feasibility of the project.

Design and Construction

Design Requirements

Please carefully review CSX's Design and Construction Standard Specifications prior to designing an encroachment proposal. These specifications can be found on the CSX website by clicking the link below and referencing the 'Specifications for Design and Construction' section.

- Specifications for Design And Construction
- All efforts should be made to comply with CSX's standard specifications. You may request CSX to review a design that does not meet the specification criteria by submitting a variance proposal; however, additional review fees are required for variance requests (see page 7) and approval is not guaranteed.

The American Railway of Engineering and Maintenance of Way Association (AREMA) is also a resource that could prove helpful in designing your project. The AREMA website is www.arema.org.

All occupancies should be designed and constructed so that rail operations and facilities are not interfered with, interrupted, or endangered. In addition, proposed facilities should be located to minimize encumbrance to the corridor so that the railroad will have unrestricted use of its corridor for current and future operations.

To assist you with preparing drawings, CSX has developed samples and templates identifying the information required for our staff to complete a review. See "Drawing Guidelines" in the Appendix for details. The drawings contain tables requesting specific information. While this information may not be necessary for your particular operations or industry, it is required for CSX to properly consider the proposal.

Construction Activities

The safety and integrity of CSX rail operations is of paramount importance to CSX. Each project is reviewed by CSX independently to determine, in its sole discretion, the need for protection services and/or construction manager services and/or On-Track Worker Safety Training. If required for the project, the project owner will be invoiced for the services provided during the project.

- **Protection Services**: This service cannot be provided by any personnel other than an authorized CSX employee or agent. Daily costs can be estimated at:
  - $2,100.00 per day per protection provider
  - $2,100.00 per day if a signal locate is needed
    - Any signal locate performed by CSX is for CSX facilities only – the project owner is responsible for contacting State "Call Before You Dig" programs or the nationally designated number - 811
- **Construction Managers**: Current policy and daily cost estimates include:
  - Subgrade: construction managers required for any project activity on CSX
  - Aerial: construction managers required for project set-up and final inspection
  - $1,500.00 per day, per construction manager
    - Depending on the nature of the project, additional experts may be required

Entering any railroad right of way or other railroad property without the permission of the railroad is trespassing and illegal. Violators will be prosecuted, and they risk the possibility of serious, even fatal, injury.

Railroad Valuation Maps

Railroad valuation maps (commonly referred to as "val maps") are available for informational purposes to assist with your project references. These maps provide the width of the railroad corridor as well as other railroad nomenclature such as the milepost reference and GIS number. To obtain a copy of a valuation map, please complete the Valuation Map Reproduction Request Form, which can be obtained via the following:

RAILROAD VALUATION MAPS		
Web:	External Valuation Map Request	
Mail:	CSX Transportation, Inc. Val Map Request Coordinator, J180 500 Water Street Jacksonville, FL 32202	
Fees:		
First Map	$	200.00
Each Additional Map	$	50.00
U.S. Mail Shipping *(per map)*	$	4.00
Overnight Mail	$	20.00

Upon receipt of the Valuation Map Reproduction Request Form, the Val Map Request Coordinator will contact the customer to discuss payment options.

Agreements/Permits

All work activities within the CSX operating rail corridor and/or other CSX property must be reviewed and approved, including installations within public road rights-of-way. For installation of utilities or requests to access CSX property for surveying, an agreement/permit will be provided upon completion and acceptance of the proposal review.

To access CSX property to perform activities relative to an existing facility, please review the existing agreement verbiage to determine (a) if the activity is permissible and (b) which form to submit for the request (see: "Submitting a Request," page 6). If you do not have a copy of the agreement, CSX may be able to provide a copy to you for your records. Research fees are as follows:

AGREEMENT COPIES	
Web:	Agreement Copies
Fee:	$ 50.00 per agreement

Insurance

CSX requires that insurance coverage be provided prior to any entry and/or work activity within the railroad corridor. The agreement will define the requirement in greater detail but for summary purposes, the following identifies the components:

INSURANCE COVERAGE	
COMMERCIAL GENERAL LIABILITY	**(CGL)**
Coverage:	
Per Occurrence	$ 5,000,000
Insured:	Facility Owner
Additional Insured *(unless otherwise advised)*:	CSX Transportation, Inc.
Duration:	Encroachment Lifetime
RAILROAD PROTECTIVE LIABILITY	**(RPL)**
Coverage:	
Per Occurrence	$ 5,000,000
Aggregate	$ 10,000,000
Insured:	CSX Transportation, Inc.
Duration:	Encroachment Construction Activity

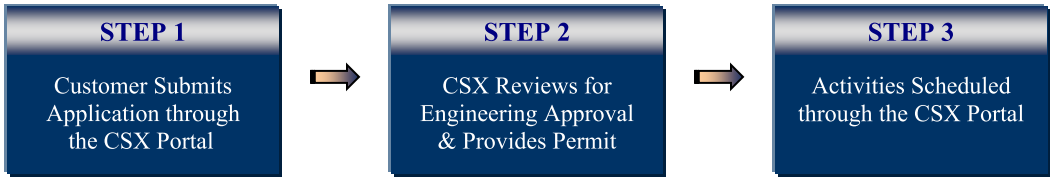
Depending on the nature of the project, CSX may offer the option of paying a risk fee to cover the cost of adding the work activity to CSX's Railroad Protective Liability (RPL) Policy for the period of actual construction. The fees, if approved, can generally be estimated as noted below but are subject to change depending on the specific project parameters:

RPL RISK FEE					
FACILITY CROSSING INSTALLATION – PER TRACK				ACCESS ONLY	
Aerial	Sub-Grade			Right of Entry	
	(Casing Diameter Size - Inches)				
$ 1,000	From 0 to less than 30	$	1,250	Surveys	$ 700
	30 to less than 45	$	1,700	Inspections/Access (no equipment)	$ 700
	45 to less than 75	$	3,200	Inspections/Access/ Soil Borings (w/ equipment)	$ 3,200
	75 to less than 100	$	6,200	Grading	$ 3,200
	100 to less than 120	$	12,000	Environmental (investigations)	$ 3,200
FACILITY PARALLEL INSTALLATION: CONTACT CSX					

Submitting a Request

Application

Consideration of your proposal follows three primary steps:



It is important that your request be as complete and accurate as possible to prevent delay or rejection. Upon receipt of the application and related documents, CSX will provide the project contact noted on the application form an email acknowledging receipt, invoice of fees, and the current estimated time for review of the proposal. Due to the variation in the number and complexity of proposals received by CSX during the course of the year, timeframes for review average around 30 days for CSX's review. If the nature of the project requires a variance approval, site assessment or resources outside of the CSX organization, timeframes for review would increase dependent on availability of the resources.

********Please write down the tracking number assigned to your application for future reference.**

Templates and sample forms **can be found on the CSX website at:**

www.csx.com

- **Click on Customers tab at the top of the page.**
- **Click on CSX Real Estate link**
- **Choose Permitting tab on left side of page**

Guidelines for form selection include:

- **Utility Application (**new installations, upgrade/modification to existing facilities)
  - Pipelines
  - Wirelines
  - Culverts

- **Right of Entry Applications** (temporary purpose only)
  - Surveys
  - Environmental Investigation
  - Ingress/Egress (short-term over non-operating operating)
  - Inspection (bridges, roads, etc.)
  - Monitoring wells
  - Soil boring or sampling
  - Oversized equipment move over operating track and/or property
  - Property remediation

- **Outside Party (OP) Request Form (scheduling construction work new/maintenance)**
  - New Facilities
    - The OP Request is used to schedule your construction.
      - New Construction - Prior to scheduling your construction, you must have an executed agreement and approved plans, which would have been obtained through Utility Application Process described above.
      - Maintenance – In order to perform any work on existing facilities on CSX Property, an existing agreement must already be in place. If there is not an existing agreement, a Utility Application must first be submitted to bring the facilities under an agreement.

      *Note: Insurance is required for all OP requests. See insurance section for more details.

  You must schedule your work activity through the CSX Property Portal. You will receive an email notification containing a special reference number and link to the CSX Property Outside Party Request Form.

- **Design and Construction Specifications**
  - Wirelines
    - If subgrade, and casing is greater than six (6) inches, use pipeline specifications for pipe details
  - Pipelines

Plans and Drawings

Plans/drawings are required for review and approval of encroachment and access requests. The plans should be in PDF format and be clear, concise, and accurately reflect design scope of the project and the impact to the CSX property. The nature of the project prescribes the information required for CSX to complete a review. Please note that review of your project will be delayed if the necessary information is not provided.

- **Utility Application** must be submitted with **design** plans that indicate the following:
  - See "Drawing Guidelines" in Appendix, Pages 10 and/or 11, for more details

- **Right of Entry Application** must be submitted with **location** maps that indicate the following:
  - Area of access on CSX property
  - Nearest public road
  - If environmental investigation also include maps that indicate:
    - Ground water flow
    - Distribution of contaminants and soil
    - Distribution of contaminants and ground water

Review Fees

All requests require a non-refundable review fee payable to CSX Transportation, Inc. Below is the schedule of fees. A "**standard**" proposal meets CSX's specifications, i.e., no design or construction method variation. A "**variance**" proposal does not meet CSX's specifications. Horizontal directional drilling is not a standard approved method of installation and considered a variance.

REVIEW FEE SCHEDULE: UTILITY ENCROACHMENTS		
Per Location		
	Standard	**Variance**
Aerial Crossings		
Wireline	$ 1,660	$ 4,170
Pipeline: Overhead pipe structures not accepted	Contact CSX	Contact CSX
Subgrade Crossings (based on casing diameter size)		
0 to less than 10 inches	$ 1,910	$ 4,420
10 inches to less than 24 inches	$ 2,560	$ 6,030
24 inches to less than 30 inches	$ 3,315	$ 6,830
30 inches to less than 42 inches	$ 4,620	$ 8,135
42 inches to less than 66 inches	$ 5,325	$ 8,840
66 inches to less than 96 inches*	$ 7,685	$ 11,500
Greater than 96 inches*	Contact CSX	Contact CSX
Longitudinal Occupancies (i.e. paralleling tracks)		
0 to less than 500 linear feet*	$ 3,315	$ 5,575
Greater than 500 linear feet*		
Stage 1:	$ 3,315	TBD
Stage 2:	An estimate, based on the project's complexity, will be provided at end of Stage 1, minimum $20,000.	

REVIEW FEE SCHEDULE: OTHER ACTIVITIES		
Towers	**Standard**	**Variance**
Tower*	$ 5,325	Contact CSX
Tower Co-location	$ 5,325	
Modification	$ 450	
Site Study Fee	$ 300 per location	
Rights of Entry	**Standard**	**Variance**
General Access	$ 2,000	Contact CSX
Environmental Investigation	$ 4,700	
Wide Load Crossing	$ Contact CSX	
Site Assessments	**Standard**	**Variance**
Site Assessment	$ 2,500	Contact CSX
Project Activities	**Standard**	**Variance**
Project Coordination/Scheduling	$ 150	N/A

CSX RESERVES THE RIGHT TO CHARGE ADDITIONAL FEES AND/OR ALLOW CSX'S CONTRACTORS, CONSULTANTS, AUDITORS, ETC. TO INVOICE DIRECTLY FOR (I) DIRECT COSTS FROM CSX'S CONTRACTORS, CONSULTANTS, AUDITORS, ETC. IN CONNECTION WITH UTILITY ENCROACHMENTS AND (II) ADDITIONAL FEES FOR ANY PERMIT SUBMITTAL THAT REQUIRES 3 OR MORE REVIEWS OF REVISIONS TO THE ENGINEERING DRAWINGS.

* Indicates transactions that may require a site assessment or additional fees for consultant services

Review

CSX reviews each request independently for safety, specification compliance, and both short-term and long-term impacts to railroad operations and property usage. The contact identified on the application will receive:

- **Receipt Notification**
  - Advises request received by CSX
- **Engineering Notification**
  - Advises request either:
    - Approved and permit forthcoming
    - Requires additional information for approval
    - Declined – CSX will endeavor to assist you with alternatives to any proposal that is declined
- **Permit Notification**
  - Provides permit/agreement for facility occupation
  - Instructions for scheduling work activity

Scheduling Activity

The Outside Party Request Form (OP Form) is utilized for scheduling all work activities on CSX property.

- **New Installations**
  - Form is provided with permit/agreement
- **Existing Facilities w/ approved Permit/Agreement**
  - Please schedule your request through CSX Property Portal via link: Scheduling Project Activity,
  - Provide scheduling fee
  - Provide evidence of insurances (see "Insurance" on page 5)

If you require a copy of the permit/agreement for an existing facility, see "Agreements/Permits" on page 4 for additional information on how to obtain a copy.

Appendix

News You Can Use

PERMITTING LINKS	
CSX Website:	**www.csx.com** **Permit Information Location: Type "Permits" in site search box (top right hand corner) and select "Permits: Real Estate" from list.**
Permitting Instructions:	**Information Packet**
Specifications:	**Pipeline: Pipeline Design Construction Standards** **Wireline: Wireline Design Construction Standards** **Interim Guidelines for Horizontal Directional Drilling** **Sample Fraction Mitigation Plan for Horizontal Directional Drilling**
Drawings:	**Drawing Guidelines (Utility Installations)** **Sample Drawings (Utility Installations)** **Blank Canvas Drawings (Utility Installations)** – see 'Blank Canvas Drawings'
Applications:	**Facility Encroachment: Facility Application** **Tower/Co-location: Tower Application** **Right of Entry: Right of Entry Application**
Scheduling Activity:	**Outside Party Request Form**

OTHER LINKS	
CSX Emergency Hotline:	**1-800-232-0144**
Railroad Valuation Map Request:	**External Valuation Map Request**
Existing Contract Information:	**Existing Contracts**
Request Copy of Agreements:	**Agreement Copies**
TellCSX:	**www.csx.com;** ▪ **Select: About Us** ▪ **Select: Contact Us** ▪ **Select: Category of your choice in the TellCSX form field**

Drawing Guidelines

Drawings

Each application submitted to CSX must include drawings/plans for the proposed project in PDF format and include both plan and profile views.

Plan and Profile

CSX has developed plan and profile drawings illustrating **required** data as outlined in CSX's Design & Construction Standard Specifications for both pipeline and wireline occupancies. The tables in the drawings identify the information that is required for CSX to complete a review of your proposal. Drawings for your use include:

- **Instructional:** identifies information **required for submittal**
  - *Plan View*
  - *Pipeline Profile View*
  - *Sub-grade Wireline Profile View*
  - *Aerial Wireline Profile View*
- **Canvas:** templates which can be saved and information inserted electronically
  - *Plan View*
  - *Pipeline Profile View*
  - *Sub-grade Wireline Profile View*
  - *Aerial Wireline Profile View*

Please review the instructional drawings prior to completing your proposal drawings (see: Drawing Package). The drawings contain tables requesting specific information. While this information may not be necessary for your particular operation or industry, it is **required** for CSX to properly consider the proposal. Requests submitted that do not include the required information will be declined. The instructional and canvas drawings can be found on the CSX Permitting Website, see section 'Blank Canvas Drawings at the bottom of the page.

When using the blank canvas templates, please note the following:

- **A current version of Adobe Reader (or use of Adobe Acrobat Version 8 to current) is required. To download a current version of Adobe Reader, please click here.**
- **Once the blank canvas template is open and selected, click on the "Highlight Fields" button in the top right section of the screen. All fields that can be completed electronically will appear in a light blue color. For easier navigation, you may also press the tab key on your keyboard to move the cursor from field to field.**
- **Ensure that all applicable fields in the table(s) are completed and in compliance with CSXT's current Design & Construction Standard Specifications for both Pipeline and Wireline occupancies.**
- **Once the tables are completed, click in the large image area to upload the plan or profile view of the drawing. If desired, click in the small image area to upload your company log.**

CSX System Map

Appendix B

Pipe Rehabilitation Summary Table

Addendum 1 – 4/3/2026

Appendix B - Pipe Rehabilitation Summary Table
City of Marysville
Sanitary Sewer Improvements

Detailed Rehab Items		Notes
R1. Cut Attached Encrustation, Grease, Etc.[1]	R5. Chemical Joint Grouting (Pipe Diameter 8" to 12")[2]	[1] Indicates X for rehab item for entire sewer and # for 1 or more instances of rehab item.
R2. Cut Protruding Tap/Lateral or Sewer[2]	R6. Chemical Joint Grouting (Pipe Diameter 15" to 48")[2]	[2] Indicates # of instances of rehab items only.
R3. Heavy Cleaning (Pipe Diameter 8" to 12")	R7. CIPP Sewer Lining/Patches (Pipe Diameter 8" to 12")[1]	[3] Refer to Appendix A for work location maps.
R4. Heavy Cleaning (Pipe Diameter 15" to 48")	R8. CIPP Sewer Lining/Patches (Pipe Diameter 15" to 48")[1]	[4] Refer to Appendix C for range of potential flows to be considered where bypassing is required.

Grey shading represents pipe segments denoted to require special access requirements.
Blue shading represents pipe segments potenitally within MDOT ROW.

							Detailed Rehab Items										
Pipe Asset ID	Work Location Map Sheet Number[3]	Downstream Meter Number[4]	Upstream Manhole Asset ID	Upstream Manhole Depth	Downstream Manhole Asset ID	Downstream Manhole Depth	R1	R2	R3	R4	R5	R6	R7	R8	Pipe Length (Feet)	Pipe Diameter (Inches)	Pipe Material
5660	1	M03	3006	29.7	3002	24.9						1		2	164	15	Reinforced Concrete/C76-Unknown
5877	2	M03	1315	13.5	3037	15.9	1					1			291	15	Vetrified Clay Pipe
5221	2	M03	3017	18.8	3014	22.7	2					1			454	15	Vetrified Clay Pipe
5220	2	M03	3037	16.1*	3017	16.1*	1							2	448	15	Vetrified Clay Pipe
5714	3	M02	1291	20.9	1253	19.0						1		1	469	18	Reinforced Concrete/C76-Unknown
6025	4	M03	3015	10.1	3012	10.1							X		338	10	Vetrified Clay Pipe
6047	5	M03	3141	17.5	3123	19.5						1			402	18	Reinforced Concrete/C76-Unknown
6045	5	M03	3100	9.1	3153	13.4	X			X		1			322	18	Reinforced Concrete/C76-Unknown
6060	5	M03	3083	14.7	3081	15.3	1				12				321	10	Vetrified Clay Pipe
6065	5	M03	3033	15.9	3020	16.6	2				3				208	10	Vetrified Clay Pipe
6067	5	M03	3029	17.0	3019	16.0	2					1			276	15	Vetrified Clay Pipe
6068	5	M03	3019	16.0	3016	15.4	5					1			301	15	Vetrified Clay Pipe
6069	5	M03	3016	15.4	3013	13.7	1					2			299	15	Vetrified Clay Pipe
6128	5	M03	3111	14.4	3110	17.0	X					1			400	15	Reinforced Concrete/C76-Unknown
6134	5	M03	3036	14.8	3033	15.9					2		1		142	10	Vetrified Clay Pipe
6130	5	M03	3109	15.8	3107	11.4	1					1		1	232	15	Reinforced Concrete/C76-Unknown
5452	6	M02	1228	23.1	1296	26.9				X		3			469	18	Reinforced Concrete/C76-Unknown
5939	6	M02	1008	20.6	1320	17.3	1					2			535	18	Reinforced Concrete/C76-Unknown
5209	9	M07	1039	16.0	1331	17.1						1		1	320	15	Vetrified Clay Pipe
5210	9	M07	1331	17.1	1089	16.0						1			171	15	Vetrified Clay Pipe
5686	9	M07	1338	15.4	1340	16.5			X				X		173	10	Reinforced Concrete/C76-Unknown
5907	9	M07	1039	15.9	1340	16.5					1				221	10	PVC Truss/Unknown
5601	10	M07	1147	15.0	1145	15.0		2			3				351	10	Vetrified Clay Pipe
5602	10	M07	1145	15.0	1112	16.4					2				377	10	Vetrified Clay Pipe
5607	10	M07	1221	15.6	1218	17.1		1			1		1		373	10	Vetrified Clay Pipe
5793	10	M07	1271	14.7	1270	15.6	1				1				113	10	Truss
5216	10	M07	1009	21.4	1321	22.1	1					1			309	18	Vetrified Clay Pipe
5628	10	M07	1309	15.7	1308	16.7		1					1		146	10	Vetrified Clay Pipe
5767	10	M07	1310	13.8	1309	15.7	1	1			1				318	10	Vetrified Clay Pipe

Appendix B - Pipe Rehabilitation Summary Table
City of Marysville
Sanitary Sewer Improvements

Detailed Rehab Items		Notes
R1. Cut Attached Encrustation, Grease, Etc.[1]	R5. Chemical Joint Grouting (Pipe Diameter 8" to 12")[2]	[1] Indicates X for rehab item for entire sewer and # for 1 or more instances of rehab item.
R2. Cut Protruding Tap/Lateral or Sewer[2]	R6. Chemical Joint Grouting (Pipe Diameter 15" to 48")[2]	[2] Indicates # of instances of rehab items only.
R3. Heavy Cleaning (Pipe Diameter 8" to 12")	R7. CIPP Sewer Lining/Patches (Pipe Diameter 8" to 12")[1]	[3] Refer to Appendix A for work location maps.
R4. Heavy Cleaning (Pipe Diameter 15" to 48")	R8. CIPP Sewer Lining/Patches (Pipe Diameter 15" to 48")[1]	[4] Refer to Appendix C for range of potential flows to be considered where bypassing is required.

Grey shading represents pipe segments denoted to require special access requirements.
Blue shading represents pipe segments potenitally within MDOT ROW.

							Detailed Rehab Items										
Pipe Asset ID	Work Location Map Sheet Number[3]	Downstream Meter Number[4]	Upstream Manhole Asset ID	Upstream Manhole Depth	Downstream Manhole Asset ID	Downstream Manhole Depth	R1	R2	R3	R4	R5	R6	R7	R8	Pipe Length (Feet)	Pipe Diameter (Inches)	Pipe Material
5606	10	M07	1223	11.5	1221	15.6		1			2				351	10	Vetrified Clay Pipe
5791	10	M07	1177	14.0	1175	13.9					2				389	10	Vetrified Clay Pipe
5612	10	M07	1192	20.3	1193	20.7	1				1				169	10	Vetrified Clay Pipe
5615	10	M07	1187	19.9	1335	21.7	1				3				183	10	Vetrified Clay Pipe
5603	10	M07	1112	16.4	1215	17.7	3				3				43	10	Truss
5215	10	M07	1020	20.9	1009	21.4						1			301	18	Vetrified Clay Pipe
5630	10	M07	1307	17.9	1306	18.2	1				1				391	10	Vetrified Clay Pipe
5629	10	M07	1308	16.7	1307	17.8							X		338	10	Vetrified Clay Pipe
5642	11	M07	1114	13.9	1214	15.4	X				6		1		377	10	PVC Truss/Unknown
6053	12	M03	3172	13.4	3102	15.0	2					4			372	18	Reinforced Concrete/C76-Unknown
5381	13	M01	2248	18.4	2694	15.4						3			130	21	Reinforced Concrete/C76-Unknown
5379	13	M01	2041	18.9	2027	19.1				X		6			352	21	Reinforced Concrete/C76-Unknown
6254	13	M01	2101	21.5	2082	20.4				X		1			257	21	Reinforced Concrete/C76-Unknown
5275	13	M01	2054	19.7	2041	18.9				X		13			343	21	Reinforced Concrete/C76-Unknown
5380	13	M01	2027	19.0	2248	18.3				X		8			347	21	Reinforced Concrete/C76-Unknown
8173	13	M01	2693	16.1	2693-S	No Depth						1		1	24	24	Truss
5313	15	M02	1130	19.4	1093	19.7	1					1		1	152	18	Vetrified Clay Pipe
5426	15	M02	1210	13.5	1053	15.7		1			2				405	10	Vetrified Clay Pipe
5594	15	M02	1168	16.1	1094	18.4							1		435	8	PVC Truss/Unknown
5420	15	M07	1042	16.8	1260	18.7	1				3				182	10	Vetrified Clay Pipe
5522	15	M07	1107	14.4	1103	16.7	1	1			1				376	10	Vetrified Clay Pipe
5527	15	M07	1065	15.0	1059	15.9		1	X		2				278	10	Vetrified Clay Pipe
5529	15	M07	1052	16.4	1042	16.7	1				1		1		227	10	Vetrified Clay Pipe
5523	15	M07	1103	16.7	1297	20.4	1		X		5		4		426	10	Vetrified Clay Pipe
5807	15	M07	1110	9.9	1109	11.5			X				X		297	10	Vetrified Clay Pipe
5180	16	M07	1196	12.1	1194	14.6	2				2				387	10	Vetrified Clay Pipe
5859	16	M07	1120	12.8	1118	16.0		1			1				297	10	Vetrified Clay Pipe
5746	16	M07	1182	16.1	1180	18.2	2	1			2				391	10	Vetrified Clay Pipe
5905	16	M07	1331	15.9	1341	14.6			X				1		389	8	Vetrified Clay Pipe

Appendix B - Pipe Rehabilitation Summary Table
City of Marysville
Sanitary Sewer Improvements

Detailed Rehab Items		Notes
R1. Cut Attached Encrustation, Grease, Etc.[1]	R5. Chemical Joint Grouting (Pipe Diameter 8" to 12")[2]	[1] Indicates X for rehab item for entire sewer and # for 1 or more instances of rehab item.
R2. Cut Protruding Tap/Lateral or Sewer[2]	R6. Chemical Joint Grouting (Pipe Diameter 15" to 48")[2]	[2] Indicates # of instances of rehab items only.
R3. Heavy Cleaning (Pipe Diameter 8" to 12")	R7. CIPP Sewer Lining/Patches (Pipe Diameter 8" to 12")[1]	[3] Refer to Appendix A for work location maps.
R4. Heavy Cleaning (Pipe Diameter 15" to 48")	R8. CIPP Sewer Lining/Patches (Pipe Diameter 15" to 48")[1]	[4] Refer to Appendix C for range of potential flows to be considered where bypassing is required.

Grey shading represents pipe segments denoted to require special access requirements.
Blue shading represents pipe segments potenitally within MDOT ROW.

							Detailed Rehab Items										
Pipe Asset ID	Work Location Map Sheet Number[3]	Downstream Meter Number[4]	Upstream Manhole Asset ID	Upstream Manhole Depth	Downstream Manhole Asset ID	Downstream Manhole Depth	R1	R2	R3	R4	R5	R6	R7	R8	Pipe Length (Feet)	Pipe Diameter (Inches)	Pipe Material
5853	16	M07	1251	10.0	1249	10.2				X		1			96	15	Vetrified Clay Pipe
5752	16	M07	1158	16.8	1157	17.4			X		2				409	10	Vetrified Clay Pipe
5749	16	M07	1174	9.7	1176	10.4		2			2				248	8	Vetrified Clay Pipe
5378	16	M07	1016	8.7	1005	11.6			X		1		2		599	8	Vetrified Clay Pipe
6252	16	M07	1005	11.6	1341	14.6					1		1		396	8	Vetrified Clay Pipe
5843	16	M07	1344	6.4	1224	4.4			X		2		1		228	8	PVC Truss/Unknown
5846	16	M07	1283	8.1	1222	6.0		1	X		1		1		305	8	Vetrified Clay Pipe
5754	16	M07	1155	4.8	1151	10.3							1		245	8	Vetrified Clay Pipe
5809	17	M01	2262	12.7	2258	12.6					2		1		229	8	Truss
5052	18	M01	2353	11.9	2339	12.1	1				1				342	8	Vetrified Clay Pipe
5067	18	M01	2446	13.9	2019	14.0					1				101	12	Truss
5343	18	M01	2440	11.2	2656	14.1					1				156	8	PVC Truss/Unknown
5105	19	M01	2678	17.7	2305	17.0						1			350	48	Reinforced Concrete/C76-Unknown
5457	19	M01	2106	8.6	2096	10.7					1				339	8	Vetrified Clay Pipe
5104	19	M01	2552	13.8	2678	17.5						1			405	15	Reinforced Concrete/C76-Unknown
5117	20	M01	2407	8.4	2149	12.0			X		2				387	8	Vetrified Clay Pipe
5236	20	M01	2607	18.9	2403	19.2					1				350	12	Truss
6094	20	M01	2649	9.8	2282	11.3					1				476	8	Truss
5228	20	M01	2316	25.1	2308	24.9	1					1			359	24	Reinforced Concrete/C76-Unknown
5861	20	M01	2600	3.7	2377	5.1					1		1		174	8	Truss
6159	21	M01	2294	10.3	2089	11.6						3			265	15	Truss
6176	21	M01	2368	9.4	2359	12.6	1					5			257	24	Reinforced Concrete/C76-Unknown
6100	21	M01	2067	11.6	2159	10.6	1				1		2		113	8	Vetrified Clay Pipe
6180	21	M01	2310	9.7	2302	8.6	5					6		2	153	15	Truss
6097	21	M01	2152	7.1	2091	10.3							1		198	8	PVC Truss/Unknown
8001	21	M05	2750	11.4	2749	11.6		1	X		2		X		47	12	PVC Truss/Unknown
5271	22	M01	2112	21.7	2101	21.5	1					1			212	21	Reinforced Concrete/C76-Unknown
5293	22	M01	2711	22.5	2704	20.0						1		1	461	24	PVC Truss/Unknown
5762	22	M01	2601	20.7	2395	21.8					1				377	10	Truss

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City of Marysville
Sanitary Sewer Improvements

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R1. Cut Attached Encrustation, Grease, Etc.[1]	R5. Chemical Joint Grouting (Pipe Diameter 8" to 12")[2]	[1] Indicates X for rehab item for entire sewer and # for 1 or more instances of rehab item.
R2. Cut Protruding Tap/Lateral or Sewer[2]	R6. Chemical Joint Grouting (Pipe Diameter 15" to 48")[2]	[2] Indicates # of instances of rehab items only.
R3. Heavy Cleaning (Pipe Diameter 8" to 12")	R7. CIPP Sewer Lining/Patches (Pipe Diameter 8" to 12")[1]	[3] Refer to Appendix A for work location maps.
R4. Heavy Cleaning (Pipe Diameter 15" to 48")	R8. CIPP Sewer Lining/Patches (Pipe Diameter 15" to 48")[1]	[4] Refer to Appendix C for range of potential flows to be considered where bypassing is required.

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							Detailed Rehab Items										
Pipe Asset ID	Work Location Map Sheet Number[3]	Downstream Meter Number[4]	Upstream Manhole Asset ID	Upstream Manhole Depth	Downstream Manhole Asset ID	Downstream Manhole Depth	R1	R2	R3	R4	R5	R6	R7	R8	Pipe Length (Feet)	Pipe Diameter (Inches)	Pipe Material
5159	22	M05	2546	8.6	2545	9.3		2			1		1		244	10	Reinforced Concrete/C76-Unknown
5286	22	M05	2394	11.7	2393	7.7			X		3		5		447	10	Vetrified Clay Pipe
5296	22	M05	2547	8.3	2546	8.6			X		5				255	10	Reinforced Concrete/C76-Unknown
5519	22	M05	2488	8.9	2595	9.9		2	X		7				220	10	Vetrified Clay Pipe
5880	22	M05	2221	8.8	2215	11.8					1				292	10	Reinforced Concrete/C76-Unknown
5885	22	M05	2467	11.0	2169	11.8						1			419	15	Reinforced Concrete/C76-Unknown
6121	22	M05	2542	4.5	2467	5.5	2	1					X		142	10	PVC Truss/Unknown
6308	22	M05	2751	7.8	Tee Connection	No Depth		3	X		1		X		216	10	Vetrified Clay Pipe
6217	22	M05	2490	7.8	2751	6.9					1				175	10	Vetrified Clay Pipe
5305	23	M01	2466	8.2	2531	7.4			X		1				277	12	Reinforced Concrete/C76-Unknown
5409	23	M01	2103	19.6	2084	19.5				X		5			368	18	Reinforced Concrete/C76-Unknown
5403	23	M01	2319	16.5	2114	19.3						8			299	18	Reinforced Concrete/C76-Unknown
5481	23	M01	2276	8.1*	2434	8.1*							1		180	12	Vetrified Clay Pipe
5936	23	M05	2456	7.8	2454	10.3	1	1	X		11				227	10	Vetrified Clay Pipe
5432	25	M06	2560	12.3	2687	12.2								X	351	21	Reinforced Concrete/C76-Unknown
5534	25	M06	2562	7.6	2661	8.7					1		X		400	12	Reinforced Concrete/C76-Unknown
5842	25	M06	2181	11.7	2289	11.3					1		1		78	8	Vetrified Clay Pipe
6064	26	M01	2059	10.8	2047	10.7	1				1				348	8	Truss
5133	26	M06	2233	12.0	2605	11.5					1		1		122	8	Truss
5051	27	M01	2362	7.9	2353	11.9	1				1				278	8	Vetrified Clay Pipe
5038	29	M04	2448	9.8	2442	7.8					1				306	12	Vetrified Clay Pipe
5085	29	M04	2063	10.5	2051	10.9	X				4				352	10	Reinforced Concrete/C76-Unknown
5437	30	M04	2334	7.3	2315	7.4		1			1				111	12	Reinforced Concrete/C76-Unknown
5081	30	M04	2663	10.9	2638	12.6							1		331	10	Reinforced Concrete/C76-Unknown
5387	31	M04	2463	14.7	2527	13.0								X	347	15	Reinforced Concrete/C76-Unknown
5386	31	M04	2569	12.7	2463	14.7				X		3		X	354	15	Reinforced Concrete/C76-Unknown
5388	31	M04	2527	13.0	2207	13.0				X		3		3	352	15	Reinforced Concrete/C76-Unknown
5470	32	M01	2094	6.4	2070	13.0			X				X		324	12	Vetrified Clay Pipe
5468	32	M01	2083	10.4	4012	5.5							X		131	12	Truss

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City of Marysville
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R4. Heavy Cleaning (Pipe Diameter 15" to 48")	R8. CIPP Sewer Lining/Patches (Pipe Diameter 15" to 48")[1]	[4] Refer to Appendix C for range of potential flows to be considered where bypassing is required.

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							Detailed Rehab Items										
Pipe Asset ID	Work Location Map Sheet Number[3]	Downstream Meter Number[4]	Upstream Manhole Asset ID	Upstream Manhole Depth	Downstream Manhole Asset ID	Downstream Manhole Depth	R1	R2	R3	R4	R5	R6	R7	R8	Pipe Length (Feet)	Pipe Diameter (Inches)	Pipe Material
5469	32	M01	4012	5.5	2094	6.4							X		90	12	Vetrified Clay Pipe
5463	32	M01	2378	8.3	2445	7.7					9				185	8	Vetrified Clay Pipe
5473	32	M01	2360	9.4	2348	10.8	X		X		13		X		321	10	Reinforced Concrete/C76-Unknown
5474	32	M01	2348	9.8*	2338	9.8*	X		X		2		X		273	10	Reinforced Concrete/C76-Unknown
5303	33	M01	2581	10.6	2617	10.8					3				242	12	Reinforced Concrete/C76-Unknown
5254	33	M01	2734	7.5	2739	6.3		1			2				260	8	Vetrified Clay Pipe

*Approximate depth of railroad track elevation to crown of pipe provided at railroad crossing.