

CITY OF DE PERE

PROJECT

24-17

COMMUNITY CENTER UTILITY RELAY

**BID DATE:
DECEMBER 12, 2024
@ 1:00 PM**

Bid documents, including plans and specifications, are available for download at www.QuestCDN.com. The QuestCDN website can also be accessed through the City website at www.deperewi.gov/projects or by pressing the *Projects* icon at the bottom of any City website page. Download cost is \$22 for each contract. Bidders will be charged an additional fee of \$42 to submit a bid electronically. Bidding documents may be viewed on the QuestCDN website or at the Municipal Service Center, 925 S. Sixth Street, De Pere, WI 54115.

Bid Tabs must be verified by staff prior to posting and will be available for viewing on the website within 7 days following the bid opening. Award information will be pending until approved by the Common Council.

SECTION 00 01 10

TABLE OF CONTENTS

INTRODUCTORY INFORMATION

<u>Section</u>	<u>Title</u>
00 00 01	PROJECT MANUAL COVER
00 01 10	TABLE OF CONTENTS

PROJECT BID DOCUMENTS

<u>Section</u>	<u>Title</u>
00 11 13	ADVERTISEMENT TO BID
00 21 13	INSTRUCTIONS TO BIDDERS
00 41 13	BID FORM
00 41 43	BID SCHEDULE
00 43 13	BID BOND
00 43 33	PROPOSED PRODUCTS FORM
00 43 36	TABULATION OF SUBCONTRACTORS

CONTRACTING REQUIREMENTS

<u>Section</u>	<u>Title</u>
00 51 00	NOTICE OF AWARD
00 52 13	CONTRACT
00 55 00	NOTICE TO PROCEED
00 61 13	PAYMENT BOND
00 61 16	PERFORMANCE BOND
00 62 76	APPLICATION FOR PAYMENT
00 65 16	CERTIFICATE OF SUBSTANTIAL COMPLETION

DIVISION 1 GENERAL REQUIREMENTS

<u>Section</u>	<u>Title</u>
01 10 00	SUMMARY OF WORK
01 22 01	MEASUREMENT AND PAYMENT SANITARY SEWER
01 22 02	MEASUREMENT AND PAYMENT STORM SEWER
01 22 04	MEASUREMENT AND PAYMENT STREET AND DRAINAGE CONSTRUCTION
01 22 05	MEASUREMENT AND PAYMENT SPECIAL CONSTRUCTION
01 22 10	MEASUREMENT AND PAYMENT ELECTRICAL
01 29 00	PAYMENT PROCEDURES
01 32 33	CONSTRUCTION PHOTOGRAPHS
01 33 00	SUBMITTALS
01 41 00	REGULATORY REQUIREMENTS
01 71 23	FIELD ENGINEERING

SUPPLEMENTAL SPECIAL PROVISIONS

<u>Section</u>	<u>Title</u>
26 56 19	STREET LIGHTING

APPENDIX

- A. CANADIAN NATIONAL UTILITY CROSSING/ENCROACHMENT APPLICATION PACKET
- B. 2022 CONCRETE BOX CULVERT INSPECTION REPORT BY RUEKERT & MIELKE, INC.

CITY OF DE PERE 2024 STANDARD SPECIFICATIONS

CONTRACTING REQUIREMENTS

<u>Section</u>	<u>Title</u>
00 70 00	GENERAL CONDITIONS (See City of De Pere 2024 Standard Specifications)
DIVISION 31 –	EARTHWORK (See City of De Pere 2024 Standard Specifications)
DIVISION 32 –	EXTERIOR IMPROVEMENTS (See City of De Pere 2024 Standard Specifications)
DIVISION 33 –	UTILITIES (See City of De Pere 2024 Standard Specifications)

SECTION 00 11 13

NOVEMBER 15, 2024 – NOVEMBER 22, 2024

CITY OF DE PERE

ADVERTISEMENT TO BID

PROJECT 24-17

COMMUNITY CENTER UTILITY RELAY

Online bids will be received and accepted for Project 24-17 Community Center Utility Relay via the online electronic bidding service through QuestCDN.com, until 1:00 PM, Thursday, December 12, 2024, at which time they will be publicly accepted, displayed and read aloud.

Project 24-17 for which proposals are being sought includes the following approximate quantities:

- 600 LF relay and new sanitary sewer (8-inch to 12-inch) and associated appurtenances.
- 75 LF relay and new storm sewer (60-inch X 30-inch) squash pipe.
- 800 LF new and relay storm sewer (6-inch to 72-inch) and associated appurtenances.
- 225 SY replace concrete sidewalk, driveway and ramp.
- 550 LF replace concrete curb and gutter.
- 180 TON asphaltic concrete pavement placement.
- Light pole removal, replacement, electrical wiring, and associated appurtenances.

Complete digital project bidding documents are available for viewing and/or downloading at www.QuestCDN.com or may be examined at the office of the Director of Public Works. Digital plan documents may be downloaded for \$22 by inputting Quest project #9018714 on Quest's Project Search page. Project documents must be downloaded from QuestCDN which will add your company to the Planholder List and allow access to vBid online bidding for the submittal of your bid. Bidders will be charged an additional fee of \$42 to submit a bid electronically. The QuestCDN website can also be accessed through the City website at www.deperewi.gov/projects or by pressing the *Projects* icon at the bottom of any City website page. Contact QuestCDN Customer Support at 952-233-1632 or info@questcdn.com for assistance in membership registration, downloading digital project information and vBid online bid submittal questions.

Each proposal shall be accompanied by a bid bond in an amount equal to five percent (5%) of the bid, payable to the City of De Pere, as a guarantee that if the bid is accepted, the bidder will execute a contract and furnish a contract bond as set forth in the General Conditions of the City of De Pere. In case the bidder fails to file such contract and bond, the amount of the bid bond shall be forfeited to the City of De Pere as liquidated damages.

Project 24-17
Community Center Utility Relay

City of De Pere

The letting of the contract is subject to the provisions of the following Wisconsin Statutes:

Section 62.15 regarding Public Works.

Section 66.0901(3) regarding Prequalification of Contractor.

Each bidder shall pre-qualify by submitting proof of responsibility on forms furnished by the Director of Public Works. Such forms shall be filed with the Director of Public Works no later than 4:00 PM, Monday, December 9, 2024. Prospective bidders who have previously submitted such forms subsequent to January 1, 2024 will not be required to separately submit such forms for this project.

The City of De Pere reserves the right to reject any or all bids, to waive any informalities in bidding and to accept any proposal which the Common Council deems most favorable to the interest of the City of De Pere.

Dated this 15th day of November, 2024.

Board of Public Works
City of De Pere
Eric Rakers, P.E.
City Engineer

Project 24-17

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

ARTICLE 1 – DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
None

ARTICLE 2 – COPIES OF BIDDING DOCUMENTS

- 2.1 Complete sets of the Bidding documents in the number and for the deposit sum, if any, stated in the Advertisement to Bid may be obtained as stated in the Advertisement for bids.
- 2.2 Complete sets of Bidding Documents shall be used in preparing Bids; Owner does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 2.3 Owner, in providing the Bidding Documents on the terms stated in the Advertisement for Bids, does so only for the purpose of obtaining Bids for the Work and does not confer a license or grant for any other use.

ARTICLE 3 – QUALIFICATIONS OF BIDDERS

- 3.1 In accordance with Section 66.0901(3), each bidder shall pre-qualify by submitting proof of responsibility on forms furnished by the Director of Public Works. Such forms shall be filed with the Director of Public Works as stated in the Advertisement for Bids. Prospective bidders who have previously submitted such forms after January 1st of this year will not be required to separately submit such form for this project.

ARTICLE 4 – EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA AND SITE

- 4.1 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in the General Conditions.
- 4.2 Underground Facilities
- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.

4.3 Subsurface and Physical Conditions

A. The technical data includes:

1. Those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and
2. Those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except underground Facilities).
3. No reports of explorations or tests of subsurface conditions at or contiguous to the Site, or drawings of physical conditions relating to existing surface or subsurface structures at the Site, are known to Owner.

B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the “technical data” contained in such reports and drawings, but such reports and drawings are not Contract Documents. Contractor may not rely upon or make any claim against Owner, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. Other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. Any Contractor interpretation of or conclusion drawn from any “technical data” or any such other data, interpretations, opinions, or information.

4.4 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations relative to excavation and utility locates.

4.5 Reference is made to Section 01 10 00: Summary of Work, for work that will be completed and for the identification of the general nature of other work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work contemplated by these Bidding Documents. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other portions thereof related to price) for such other work.

4.6 It is the responsibility of each Bidder before submitting a Bid to:

- A. Examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;**
- B. Visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;**

- C. Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
 - D. Obtain and carefully study (or accept consequences of not doing so) all examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;
 - E. Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
 - F. Become aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents;
 - G. Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;
 - H. Promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies, that bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
 - I. Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.7 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and, procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

ARTICLE 5 – SITE AND OTHER AREAS

- 5.1 The Site is identified in the Bidding Documents. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in

the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor.

ARTICLE 6 – INTERPRETATIONS AND ADDENDA

- 6.1 All questions about the meaning or intent of the Bidding Documents are to be submitted to Engineer in writing. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than ten days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 6.2 Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner and Engineer.

ARTICLE 7 – BID SECURITY

- 7.1 A Bid shall be accompanied by Bid security made payable to Owner in an amount of five percent (5%) of Bidder's maximum Bid price and in the form of a certified check or bank money order or Bid bond (on the form attached) issued by a surety meeting the requirements of the General Conditions. Submittal of a Bid Bond on a form other than the Bid Bond form included in the Bidding Documents may be cause for rejection of Bid. The fully executed bid bond must be uploaded into QuestCDN. If the bidder elects to furnish bid security other than a bid bond, the bid security must be submitted in a sealed envelope enclosed in a separate package plainly marked on the outside with the notation "BID SECURITY" along with the project number and name and addressed to the Board of Public Works of the City of De Pere, Municipal Service Center, 925 S. Sixth Street, De Pere, WI 54115 **prior to the deadline for submission of bids.**
- 7.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within fifteen (15) days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner per the General Conditions.
- 7.3 Bid security of other Bidders whom Owner believes do not have a reasonable chance of receiving the award will be returned within seven days after the Bid opening.

ARTICLE 8 – CONTRACT TIMES

- 8.1 The number of days within which, or the dates by which, Milestones are to be achieved and the

Work is to be substantially completed and ready for final payment are set forth in the Bid Form and Summary of Work.

ARTICLE 9 – LIQUIDATED DAMAGES

9.1 Provisions for liquidated damages are set forth in the General Conditions.

ARTICLE 10 – SUBSTITUTE AND “OR-EQUAL” ITEMS

10.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or “or-equal” items. Whenever it is specified or described in the Bidding Documents that a substitute or “or-equal” item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Bid Form and Summary of Work.

ARTICLE 11 – SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.1 The Bidder shall submit with the Bid to Owner a list of all such Subcontractors, Suppliers, individuals, or entities proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, Bidder’s Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and making the Contract award.

11.2 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposed to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which Owner makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner subject to revocation of such acceptance after the Effective Date of the Agreement.

11.3 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.

ARTICLE 12 – PREPARATION OF BID

12.1 The Bid form is included with the Bidding documents.

12.2 All blanks on the Bid Form shall be completed by printing in ink or by typewrite and the Bid signed in

ink. Erasures or alterations shall be initialed in ink by the person signing the Bid Form. A Bid price shall be indicated for each alternative, and unit price item listed therein, or the words “No Bid,” “No Change,” or “Not Applicable” entered.

- 12.3 A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporations shall be shown below the seal.
- 12.4 A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.
- 12.5 A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown below the signature.
- 12.6 A Bid by an individual shall show the Bidder’s name and official address.
- 12.7 A Bid by a joint venture shall be executed by each joint venture in the manner indicated on the Bid Form. The official address of the joint venture shall be shown below the signature.
- 12.8 All names shall be typed or printed in ink below the signatures.
- 12.9 The Bid shall contain an acknowledgement of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.
- 12.10 The address and telephone number for communications regarding the Bid shall be shown.
- 12.11 The Bid shall contain evidence of Bidder’s authority and qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract. Bidder’s state contractor license number, if any, shall also be shown on the Bid Form.

ARTICLE 13 – BASIS OF BID; COMPARISON OF BIDS

13.1 Unit Price

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid Schedule.
- B. The total of all estimated prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accord with the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in

favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

ARTICLE 14 – SUBMITTAL OF BID

14.1 A Bid shall be submitted no later than date and time prescribed and at place indicated in Advertisement for Bids and shall be submitted electronically using the QuestCDN online bidding vBid platform. No paper bids will be accepted.

14.2 See Bid Form for a list of documents typically required to be submitted with the Bid.

ARTICLE 15 – MODIFICATION AND WITHDRAWAL OF BID

15.1 A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.

15.2 If within 24 hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid, and the Bid security will be returned. Thereafter, if the Work is rebid, that Bidder will be disqualified from further bidding on the Work.

ARTICLE 16 – OPENING BIDS

16.1 Bids will be opened as indicated in the Advertisement to Bid. The bid opening can be viewed live via the GoToMeeting information shown below. An abstract of the amounts of the base bids and major alternatives, if any, will be made available to bidders after opening the bids.

<https://global.gotomeeting.com/join/729070589>

You can also dial in using your phone. (For supported devices, tap a one-touch number below to join instantly.)

United States: +1 (571) 317-3122

- One-touch: <tel:+15713173122,,729070589#>

Access Code: 729-070-589

New to GoToMeeting? Get the app now and be ready when your first meeting starts:

<https://global.gotomeeting.com/install/729070589>

ARTICLE 17 – BIDS REMAIN SUBJECT TO ACCEPTANCE

17.1 All bids will remain subject to acceptance for the period of time stated in the General Conditions,

but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18 – EVALUATION OF BIDS AND AWARD OF CONTRACT

- 18.1 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to not be responsible. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder. Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.
- 18.2 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 18.3 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 18.4 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Supplier, and other individuals or entities proposed for those portions of the Work for which the identify of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 18.5 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.
- 18.6 Bidder agrees to waive any claim it has or may have against the Owner and the respective employees arising out of or in connection with the administration, evaluation or recommendation of any Bid.
- 18.7 If the Contract is to be awarded, Owner will award the Contract to the lowest responsible responsive Bidder whose Bid is in the best interests of the Project.

ARTICLE 19 – CONTRACT SECURITY AND INSURANCE

- 19.1 The General Conditions set forth Owner's requirements as to performance and payment bonds and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it shall be accompanied by such bonds and a certificate of insurance.

ARTICLE 20 – SIGNING OF AGREEMENT

- 20.1 When Owner gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within ten (10) days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten (10) days thereafter, Owner shall deliver one fully signed counterpart to Successful Bidder with a complete set of Drawings with appropriate identification.

END OF SECTION

SECTION 00 41 13

CITY OF DE PERE

BID FORM

PROJECT 24-17

This bid, submitted by the undersigned Bidder to the City of De Pere, in accordance with the Advertisement to Bid, which will be received until 1:00 PM, Thursday, December 12, 2024 is to furnish and deliver all materials, and to perform and do all work on the project designated per Section 01 10 00 Summary of Work.

Bidder has examined and carefully prepared the bid from the plans and specifications and has checked the same in detail before submitting said proposal or bid; and that said bidder or bidder's agents, officer or employees have not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal or bid.

Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____

BASIS OF BID:

Bidder will complete the Work in accordance with the Contract documents for the following price(s):

As stated in the attached Unit Price Bid Schedule.

Unit Prices have been computed in accordance with the General Conditions.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

TOTAL BID PRICE: \$ _____

**Project 24-17
Community Center Utility Relay**

City of De Pere

ATTACHMENTS TO THIS BID

The following documents are submitted with and made a condition of this Bid:

- A. Required Bid Security
- B. Unit Price Bid Schedule (Section 00 41 43)
- C. Proposed Products Form (Section 00 43 33)
- D. Tabulation of Subcontractors (Section 00 43 36)

BID SUBMITTAL

This Bid is submitted by _____ of _____,

The Bidder, being duly sworn, does dispose that they are an authorized representative of

Bidder, if Bidder is:

An Individual

Name (typed or printed): _____

By: _____
(Individual's signature)

Doing business as: _____

A Partnership

Partnership Name: _____

By: _____
(Signature of general partner – attach evidence of authority to sign)

Name (typed or printed): _____

A Corporation

Corporation Name: _____

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature – attach evidence of authority to sign)

**Project 24-17
Community Center Utility Relay**

City of De Pere

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____

Date of Qualification to do business in Wisconsin is ___/___/___.

Joint Venture

Name of Joint Venture: _____

First Joint Venturer Name: _____ (SEAL)

By: _____

(Signature of first joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Second Joint Venturer Name: _____ (SEAL)

By: _____

(Signature of second joint venture partner – attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(Each joint venturer must sign. Manner of signing for each individual, partnership, and corporation that is a party to joint venture should be in manner indicated above.)

Bidder's Business Address _____

Phone No. _____ Fax No. _____

E-mail _____

SUBMITTED on _____, 20____.

State Contractor License No. _____ (if applicable)

SECTION 00 41 43

CITY OF DE PERE

PROJECT 24-17

BID SCHEDULE – UNIT PRICE

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SANITARY SEWER					
SS-01	Provide 12" PVC Sanitary Sewer (Granular Backfill)	LF	175	\$	\$
SS-02	Provide 12" PVC Sanitary Sewer (Natural Backfill)	LF	270	\$	\$
SS-03	Remove and Relay 10" PVC Sanitary Sewer (Granular Backfill)	LF	50	\$	\$
SS-04	Remove and Relay 10" PVC Sanitary Sewer (Natural Backfill)	LF	60	\$	\$
SS-05	Provide 10" PVC Sanitary Sewer (Granular Backfill)	LF	15	\$	\$
SS-06	Provide 10" PVC Sanitary Sewer (Natural Backfill)	LF	20	\$	\$
SS-07	Provide 8" PVC Sanitary Sewer (Granular Backfill)	LF	50	\$	\$
SS-08	Provide 4" PVC Sanitary Sewer Lateral	LF	30	\$	\$
SS-09	Provide 12"x4" Sanitary Wye	EA	1	\$	\$
SS-10	Provide 4' Diameter Outside Drop Sanitary Sewer Manhole	VF	11	\$	\$
SS-11	Provide 4' Diameter Sanitary Sewer Manhole	VF	17	\$	\$
SS-12	Remove and Replace 4' Diameter Sanitary Sewer Manhole	VF	6	\$	\$
SS-13	Connect to Existing Sanitary Sewer Pipe (4" to 12")	EA	5	\$	\$

Project 24-17
Community Center Utility Relay

City of De Pere

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SANITARY SEWER (Continued)					
SS-14	Connect to Existing Sanitary Sewer Manhole	EA	1	\$	\$
SS-15	Dig Down and Verify Sanitary Sewer Pipe	EA	1	\$	\$
SS-16	Abandon/Remove Sanitary Sewer and Appurtenances	LS	1	\$	\$
STORM SEWER					
ST-01	Provide 38"x60" Reinforced Concrete (Class HE-III) Elliptical Storm Sewer (Granular Backfill)	LF	75	\$	\$
ST-02	Provide 72" RCP (Class III) Storm Sewer (Natural Backfill)	LF	200	\$	\$
ST-03	Provide 60" RCP (Class III) Storm Sewer (Granular Backfill)	LF	80	\$	\$
ST-04	Provide 60" RCP (Class III) Storm Sewer (Natural Backfill)	LF	160	\$	\$
ST-05	Provide 36" RCP (Class III) Storm Sewer (Natural Backfill)	LF	40	\$	\$
ST-06	Remove and Replace 36" RCP (Class III) Storm Sewer (Natural Backfill)	LF	8	\$	\$
ST-07	Remove and Replace 30" RCP (Class III) Storm Sewer (Natural Backfill)	LF	8	\$	\$
ST-08	Provide 18" PP, PVC, or RCP (Class III) Storm Sewer (Natural Backfill)	LF	65	\$	\$
ST-09	Provide 12" PP, PVC, or RCP (Class III) Storm Sewer (Granular Backfill)	LF	30	\$	\$
ST-10	Provide 12" PP, PVC, or RCP (Class III) Storm Sewer (Natural Backfill)	LF	140	\$	\$
ST-11	Provide 10" PVC Storm Sewer (Granular Backfill)	LF	30	\$	\$
ST-12	Provide 10" PVC Storm Sewer (Natural Backfill)	LF	40	\$	\$

Project 24-17
Community Center Utility Relay

City of De Pere

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STORM SEWER (Continued)					
ST-13	Provide 6" PVC Storm Sewer (Granular Backfill)	LF	30	\$	\$
ST-14	Provide 6" PVC Storm Sewer (Natural Backfill)	LF	20	\$	\$
ST-15	Provide 72"x12" Storm Branch or Inserta Tee	EA	3	\$	\$
ST-16	Provide 60"x12" Storm Branch or Inserta Tee	EA	1	\$	\$
ST-17	Provide 60"x6" Storm Branch or Inserta Tee	EA	1	\$	\$
ST-18	Provide 10' Cast-in-Place Manhole	VF	8	\$	\$
ST-19	Provide 10' Diameter Storm Manhole or Equivalent Box	VF	16	\$	\$
ST-20	Provide 9' Diameter Storm Manhole or Equivalent Box	VF	14	\$	\$
ST-21	Provide 6' Diameter Storm Manhole	VF	6	\$	\$
ST-22	Provide 5' Diameter Storm Manhole	VF	7	\$	\$
ST-23	Provide Type A Inlet	EA	2	\$	\$
ST-24	Connect to Existing 60"x84" Box Culvert	EA	1	\$	\$
ST-25	Connect to Existing Pipe with Concrete Collar (30" to 36")	EA	2	\$	\$
ST-26	Connect to Existing Pipe (6" to 18")	EA	7	\$	\$
ST-27	Dig Down and Verify Storm Sewer Pipe	EA	9	\$	\$
ST-28	Abandon/Remove Existing Storm Sewer Appurtenances	LS	1	\$	\$

Project 24-17
Community Center Utility Relay

City of De Pere

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STREET AND DRAINAGE					
SD-01	Provide Clearing and Grubbing	LS	1	\$	\$
SD-02	Provide 1-1/4" Crushed Aggregate Base Course	TON	20	\$	\$
SD-03	Provide Asphaltic Concrete Pavement Type 4 LT 58-28 S, 1-3/4" Upper Layer	TON	80	\$	\$
SD-04	Provide Asphaltic Concrete Pavement Type 3 LT 58-28 S, 2-1/4" Lower Layer	TON	110	\$	\$
SD-05	Remove and Replace 9" Doweled Concrete Pavement	SY	15	\$	\$
SD-06	Remove and Replace 24" Integral Concrete Curb and Gutter	LF	10	\$	\$
SD-07	Remove and Replace 24" Concrete Curb and Gutter	LF	610	\$	\$
SD-08	Remove and Replace 6" Concrete Sidewalk, Ramp, or Driveway	SY	120	\$	\$
SD-09	Remove and Replace 4" Concrete Sidewalk	SY	110	\$	\$
SD-10	Provide #4 Reinforcement Bars for Curb and Sidewalk	LF	420	\$	\$
SD-11	Drilled Dowel Bars	EA	10	\$	\$
SD-12	Drilled Tie Bars (Existing Sidewalk, Driveway and Curb and Gutter)	EA	50	\$	\$
SD-13	Drilled Tie Bars (Existing Concrete Pavement)	EA	5	\$	\$
SD-14	Provide Detectable Warning Field (Natural Patina)	EA	3	\$	\$
SD-15	Provide Concrete Flume	SY	5	\$	\$
SD-16	Landscaping – Topsoil, Seed, Fertilizer and Mulch	SY	40	\$	\$

Project 24-17
Community Center Utility Relay

City of De Pere

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SPECIAL CONSTRUCTION					
SC-01	Pipe Foundation Stabilization	CY	100	\$	\$
SC-02	Inlet Protection Type B	EA	3	\$	\$
SC-03	Inlet Protection Type D	EA	2	\$	\$
SC-04	Remove, Salvage & Reinstall Sign	LS	1	\$	\$
SC-05	Remove, Salvage & Reinstall Fence	LS	1	\$	\$
SC-06	Traffic Control – Grant Street	LS	1	\$	\$
ELECTRICAL					
E-01	Conduit Rigid Nonmetallic Schedule 40, 2"	LF	300	\$	\$
E-02	Concrete Base, Type 5	EA	2	\$	\$
E-03	Electrical Wire Lighting 10 AWG	LF	350	\$	\$
E-04	Electrical Wire Lighting 6 AWG	LF	1,000	\$	\$
E-05	Rewire Existing Light Pole	LS	1	\$	\$
E-06	Remove, Salvage, and Reinstall Existing Light Pole	EA	2	\$	\$
TOTAL AMOUNT BID					\$

SECTION 00 43 13

CITY OF DE PERE

BID BOND

KNOW ALL MEN BY THESE PRESENTS: That _____,

as Principal, hereinafter called Principal, and _____,

as Surety, hereinafter called Surety, are held and firmly bound unto the City of De Pere, a municipal corporation of the State of Wisconsin, as Obligee, hereinafter called City, in the amount of _____ dollars (\$_____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presence.

WHEREAS, Principal has made a proposal to the City for furnishing all materials, labor, tools, equipment and incidentals necessary to complete the work of Project 24-17 in accordance with drawings and specifications prepared by the Director of Public Works of said City, which proposal is by reference made a part hereof, and is hereinafter referred to as the BID.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall be awarded the contract for said project and Principal shall enter into a contract in accordance with the BID, then this obligation shall be null and void; otherwise it shall remain in full force and effect, provided that:

1. The liability of Surety shall in no event exceed the penalty of this bond.
2. Any suits at law or proceedings, in equity brought or to be brought against Surety to recover any claim hereunder shall be executed within six (6) months from the date of this instrument.

Signed and sealed this _____ day of _____, 20_____.

In the presence of:

WITNESS

PRINCIPAL (SEAL)

WITNESS

SURETY (SEAL)

SECTION 00 43 33

PROPOSED PRODUCTS FORM

The following is a list of material, type or model numbers and manufacturers used in the preparation of this proposal and to be used on this project:

ITEM	MATERIAL	SUPPLIER
Manholes	CONCRETE	
Inlets	CONCRETE	
Sanitary Sewer (PVC)	PVC	
Storm Sewer (PVC) <i>List Proposed Sizes</i>	PVC	
Storm Sewer (RCP) <i>List Proposed Sizes</i>	REINFORCED CONCRETE	
Storm Sewer (PP) <i>List Proposed Sizes</i>	POLYPROPYLENE	

SECTION 00 51 00

NOTICE OF AWARD

(Contractor)
(Contractor Name)
(Address)
(Address)

Project Description: 24-17 Community Center Utility Relay

The City has considered the proposal submitted by you dated (BID DATE) for the above-described project in response to its Advertisement for Bids dated November 15, 2024 and November 22, 2024.

You are hereby notified that the Common Council of the City of De Pere has accepted your bid of (Contract Amount \$_____.00).

You are required to execute the Contract and furnish the required Performance Bond, Payment Bond and Certificates of Insurance within ten (10) calendar days from the date of this notice to you.

If you fail to execute said Agreement and to furnish said bonds within ten (10) days from the date of this notice, said City will be entitled to consider all your rights arising out of the City's acceptance of your bid as abandoned and as a forfeiture of your Bid Bond. The City will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the City.

Dated this _____ day of _____ 2024.

DEPARTMENT OF PUBLIC WORKS

BY: Eric P. Rakers, P.E.
City Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by:

_____, this the _____ day of _____, 20____

By: _____

Title: _____

SECTION 00 52 13

CONTRACT

This Contract, made and entered into this day _____ (date to be affixed by City), by and between (Contractor Name), hereinafter called Contractor, and the City of De Pere, a municipal corporation of the State of Wisconsin, hereinafter called City.

WITNESSETH: That, in consideration of the covenants and agreements herein contained, to be performed by the parties hereto, and of the payments hereinafter agreed to be made, it is mutually agreed as follows:

ARTICLE I - SCOPE OF WORK

The Contractor shall furnish all materials and all equipment and labor necessary, and perform all work shown on the drawings and described in the specifications for the project entitled 24-17 Community Center Utility Relay, all in accordance with the requirements and provisions of the following documents, which are hereby made a part of this Contract:

- (a) Advertisement for Bids, dated November 15, 2024 and November 22, 2024.
- (b) Drawings designated for 24-17 Community Center Utility Relay dated November 15, 2024.
- (c) City of De Pere 2024 Construction Specifications.
- (d) Special Provisions dated November 15, 2024.
- (e) Proposal submitted by (Contractor Name) dated Bid Date.
- (f) Addenda No. dated

ARTICLE II - TIME OF COMPLETION

- (a) The work to be performed under the Contract shall be commenced within (number spelled out) (__) calendar days after receipt of written notice to proceed. The work shall be completed within (Number spelled out) (__) calendar days) or (specific calendar dates) after receipt of Notice to Proceed.
- (b) Time is of the essence with respect to the date of completion herein above stated. Failure to complete the work within the number of calendar days stated in this Article, or interim dates included in the work sequence in Section 01 10 00, Summary of Work, including any extensions granted thereto, shall entitle the City to deduct from the monies due the Contractor an amount equal to Update based on 00 70 00 - General Conditions (Page 26)(\$) per day for each calendar day of delay in the completion of the work. Such amount shall be considered and treated not as a penalty but as liquidated damages, which the City will sustain, by failure of the Contractor to complete the work within the time stated.

ARTICLE III - PAYMENT

- (a) The Contract Sum. The City shall pay to the Contractor for the performance of the Contract the amounts determined for the total number of each of the following units of work completed at the unit price stated thereafter. The number of units contained in this schedule is approximate only, and the final payment shall be made for the actual number of units that are incorporated in or made necessary by the work covered by the Contract.
- (b) Progress Payments. The City shall make payments on account of the Contract as follows:
1. On not later than the fourth Friday of every month the Contractor shall present to the City an invoice covering an estimate of the amount and proportionate value of the work done as verified by the City under each item of work that has been completed from the start of the job up to and including the fourth Friday of the preceding month, and the value of the work so completed determined in accordance with the schedule of unit prices for such items, together with such supporting evidence as may be required. This invoice shall also include an allowance for the cost of such materials and equipment required in the permanent work as have been delivered to the site but not as yet incorporated in the work.
 2. On not later than the third week of the following month, the City shall, after deducting previous payments made, pay to the Contractor 95% of the amount of the approved invoice, retaining 5% of the estimate of work done until 50% of the work has been completed. At 50% completion of the work, the previous retainage shall not yet be paid, but further partial payments shall be made in full to the contractor without additional retainage being taken unless the engineer certifies that the work is not proceeding satisfactorily. If the work is not proceeding satisfactorily, additional amounts may be retained. After substantial completion, an amount retained may be paid to the contractor, keeping retained only such amount as is needed for the remaining work.
 3. The Contractor shall notify the City in writing when all work under this Contract has been completed. Upon receipt of such notice the City shall, within a reasonable time, make the final inspection and issue a final certificate stating that the work provided for in this Contract has been completed and is accepted under the terms and conditions thereof, and that the entire balance due the Contractor as noted in said final certificate is due and payable. Before issuance of the final certificate the Contractor shall submit evidence satisfactory to the City that payrolls, material bills, and other indebtedness connected with the work under this Contract have been paid. The City shall make final payment as soon after issuance of the final certificate as practicable.

ARTICLE IV – CONTRACT DOCUMENTS

(a) Contents

1. The Contract documents consist of the following:
 - a. This Contract (pages 00 52 13-1 to 0052-13-3, inclusive).
 - b. Payment bond (pages 00 61 13-1 to 00 61 13-2, inclusive).
 - c. Performance bond (page 00 61 16-1).
 - d. General Conditions (pages 00 70 00-1 to 00 70 00-27, inclusive).

SECTION 00 55 00

NOTICE TO PROCEED

Date: _____

(CONTRACTOR NAME)
(ADDRESS)
(ADDRESS)

Project Description: 24-17 Community Center Utility Relay

You are hereby notified to commence work in accordance with the CONTRACT dated _____, within ten (10) days of this Notice. All work under this contract shall be completed within _____ (NUMBER IN WORDS) (__ #) consecutive days from the start of construction or _____ (DATE) whichever comes first.

Department of Public Works

By: Eric P. Rakers, P.E.
Title: City Engineer

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by

_____, this _____ day of _____, 20 ____.
Company Name

Signature

BY: _____
Printed Name

TITLE: _____

SECTION 00 61 13

CITY OF DE PERE

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That (CONTRACTOR NAME), as Principal, hereinafter called Contractor, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto the City of De Pere, a municipal corporation of the State of Wisconsin, as Obligee, hereinafter called the City, for the use and benefit of claimants as herein below defined in the amount _____ (CONTRACT AMT. SPELLED OUT) (\$) _____ for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ (date to be affixed by City) entered into a contract with City for Project 24-17, in accordance with drawings and specifications prepared by the Director of Public Works of said City, which contract is by reference made a part hereof, and is hereinafter referred to as the CONTRACT.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly make payments to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the CONTRACT, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with Contractor or with a subcontractor of Contractor for labor, material, or both, used or reasonably required for use in the performance of the contract, labor and material being construed to include that part of water, gas, power, lights, heat, oil, gasoline, telephone service, or rental of equipment directly applicable to the contract.
2. The above named Contractor and Surety hereby jointly and severally agree with the City that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant may sue on this bond for the use of such claimant in the name of the City, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon, provided, however, that the City shall not be liable for the payment of any costs or expenses of any such suit.
3. No suit or action shall be commenced hereunder by any claimant:
 - a. Unless claimant shall have given written notice to any two of the following: The Contractor, the City, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail, postage prepaid, in an envelope addressed to the Contractor, City, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State of Wisconsin, save that such service need not be made by a public officer.
 - b. After the expiration of one (1) year following the date on which Contractor ceased work on said CONTRACT.

Project 24-17
Community Center Utility Relay

City of De Pere

- c. Other than in a state court of competent jurisdiction in and for the County or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

- 4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens, which may be filed or recorded against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

SIGNED AND SEALED THIS _____ DAY OF _____, 20__.

In Presence of:

_____	_____	_____
(WITNESS)	(CONTRACTOR)	(SEAL)
_____	_____	_____
(WITNESS)	(SURETY)	(SEAL)

SECTION 00 61 16

CITY OF DE PERE

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That **(CONTRACTOR'S NAME)**, as Principal, hereinafter called Contractor, and _____, as Surety, hereinafter called Surety, are held and firmly bound unto the City of De Pere, a municipal corporation of the State of Wisconsin, as Obligee, hereinafter called City, in the amount of **(AMOUNT WRITTEN OUT)** (\$ _____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assign, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____ (date to be affixed by City), entered into a contract with the City for Project 24-17, in accordance with drawings and specifications prepared by the Director of Public Works of said City, which contract is by reference made a part hereof, and is hereinafter referred to as the CONTRACT.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Contractor shall promptly and faithfully perform said CONTRACT, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Whenever Contractor shall be, and declared by the City to be in default under the CONTRACT, the City having performed City's obligations there under, the Surety may promptly remedy the default, or shall promptly

1. Complete the CONTRACT in accordance with its terms and conditions or
2. Obtain a bid or bids for submission to City for completing the CONTRACT in accordance with its terms and conditions, and upon determination by the City and Surety of the lowest responsible bidder, arrange for a contract between such bidder and City make available as work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price" as used in this paragraph shall mean the total amount payable by City to Contractor under the CONTRACT and any amendments thereto, less the amount properly paid by City to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the CONTRACT falls due. No right of action shall accrue on this bond to or for the use of any person or corporation other than the owner named herein or the heirs, executors, administrators or successors of City.

SIGNED AND SEALED THIS _____ DAY OF _____, 20_____.

In the Presence of:

(WITNESS)	(CONTRACTOR)	(SEAL)
(WITNESS)	(SURETY)	(SEAL)

SECTION 00 62 76

APPLICATION FOR PAYMENT

Contractor's Application for Payment No.

Application Period:	Application Date:
Owner: City of De Pere	Contractor:
	Contractor's Project No.:

APPLICATION FOR PAYMENT

Change Order Summary

Approved Change Orders			1. ORIGINAL CONTRACT PRICE:.....	
Number	Additions	Deductions	2. Net change by Change Orders and Written Amendments (+ or -):.....	\$0.00
			3. CURRENT CONTRACT PRICE (Line 1 plus Line 2):.....	\$0.00
			4. Total completed and stored to date Column H on Progress Estimate:.....	\$0.00
			5. Retainage (per Agreement):	
			a. Work Completed - Column H (95% up to 50% of Contract or 2.5% of 100% of Contract)	\$0.00
Total	\$0.00	\$0.00	6. AMOUNT ELIGIBLE TO DATE (Line 4 minus 5).....	\$0.00
NET CHANGE BY CHANGE ORDERS: \$0.00			7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application).....	\$0.00
			8. AMOUNT DUE THIS APPLICATION (Line 6 minus Line 7).....	\$0.00

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that:(1) all previous progress payments received from Owner on account of Work done under Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by the Application for Payment is in accordance with the Contract Documents and is not defective.

By: _____ Date: _____

Payment of: \$ _____
(Line 8 or other - attach explanation of other amount)

is recommended by: _____ (Contractor) _____ (Date)

Payment of: \$ _____
(Line 8 or other - attach explanation of other amount)

is recommended by: _____ (Owner) _____ (Date)

SECTION 00 65 16

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project:	
Owner:	Owner's Contract No.:
Contractor:	

This [tentative] [definitive] Certificate of Substantial Completion applies to:

All Work under the Contract Documents: The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Contractor and Engineer, and found to be substantially complete. The Date of Substantial completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

Amended Responsibilities Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Executed by Engineer

Date

Accepted by Contractor

Date

SECTION 01 10 00

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. References
 - 2. Work Covered by the Contract Documents
 - 3. Work Sequence/Schedule
 - 4. Use of Premises
 - 5. Warranty
 - 6. Work by Others
 - 7. Project Utility Sources
 - 8. Miscellaneous Provisions

1.2 REFERENCES

- A. General Specifications. The work under this contract shall be in accordance with the City of De Pere, 2024 Construction Specifications and these Special Provisions and plans, and the latest edition of the Wisconsin Department of Transportation Standards Specifications for Highway and Structure Construction, where referenced in the City Specifications.
- B. Definitions. Any reference to the “state” or the “department” in said Standard Specifications shall mean the “City of De Pere” for the purposes of this contract.
- C. Industry Standards
 - 1. Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
 - 2. Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
 - 3. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement.
 - 4. The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements.

5. Each section of the specifications generally includes a list of reference standards normally referred to in that respective section. The purpose of this list is to furnish the Contractor with a list of standards normally used for outlining the quality control desired on the project. The lists are not intended to be complete or all inclusive, but only a general reference of standards that are regularly referred to.
6. Each entity engaged in construction on the Project shall be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.

1.3 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Project Identification

1. Project Location
 - a. Community Center Lower Parking Lot – 600 Grant Street
2. Work will be performed under the following prime contract:
 - a. 24-17 Community Center Utility Relay

B. The Work includes:

1. Sanitary Sewer and associated appurtenances new.
2. Storm Sewer and associated appurtenances relay and new.
3. Manhole and inlet installation and adjustment.
4. Concrete curb and gutter removal and replacement.
5. Concrete driveway aprons, pedestrian ramps, and sidewalk removal and replacement.
6. Asphaltic concrete paving.
7. Erosion Control.
8. Traffic Control.
9. Electrical.

1.4 WORK SEQUENCE/SCHEDULE

- A. Project shall be completed by May 30, 2025.
- B. If asphaltic concrete paving will occur in 2025. The following restoration requirements apply:
 1. All trenches shall be brought 2-inches below grade with granular backfill. The remaining 2-inch surface shall be filled with cold-patch material to allow for plowing operations to be completed through the winter. It shall be the contractor's responsibility to maintain these trenches.
 2. In locations where curb and gutter has been removed for the winter, reflective barrels or delineators shall be placed to warn City snow plow drivers of the impending hazard.
- C. Topsoil, seed, and mulch shall be completed prior to asphaltic concrete pavement placement.

- D. No work shall occur on the following holidays:
 - 1. December 24 & 25, 2024.
 - 2. January 1, 2025.
 - 3. January 20, 2025.
 - 4. May 26, 2025.
- E. Conduct construction activities to maintain access to businesses and residences throughout construction.
- F. Coordinate with the City and Canadian National Railroad and provide a minimum of two-weeks notice before any construction on the railroad property on the northeast end of the project site. The City will pay for the flagger. Adhere to all requirements of this permit, including certified staff. A copy of the Canadian National Railroad permit is included in the appendix.

1.5 USE OF PREMISES

- A. Contractor shall have full use of the premises for construction operations, including use of the Project Site, as allowed by law, ordinances, permits, easement agreements and the Contract documents.
- B. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of the Project.
- C. The Project Site is limited to property boundaries, rights-of-way, easements, and other areas designated in the Contract Documents.
- D. Provide protection and safekeeping of material and products stored on or off the premises.
- E. Move any stored material or products which interfere with operations of Owner or other Contractors.

1.6 WARRANTY

- A. The Contractor warrants and guarantees to the City that all work shall be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects will be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this proposal.
- B. If within one (1) year after the date of contract work completion or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents or by a special provision of the Contract Documents, any work is found to be defective, the Contractor shall comply in accordance with the City's written instructions. These written instructions will include either correcting such defective work or, if it has been rejected by the City, removing it from the site and replacing it with non-defective work. If the

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

1.7 WORK BY OTHERS

- A. Cooperate fully with separate contractors and/or Owner so work by others may be carried out smoothly, without interfering with or delaying work under this Contract.

1.8 PROJECT UTILITY SOURCES

- A. Green Bay Metropolitan Sewer District (NEW Water), Lisa Sarau, (lsarau@newwater.us) (920-438-1039)
- B. AT&T, Kyle Weber, (kw715w@att.com) (920-221-5969)
- C. Wisconsin Public Service, Bob Laskowski, (rtlaskowski@wisconsinpublicservice.com) (920-617-2775)
- D. Charter, Vince Albin, (vince.albin@charter.com) (920-378-0444)
- E. Nsight, Rick Vincent, (rick.vincent@nsight.com) (920-617-7316)
- F. TDS Metrocom, Steve Jakubiec, (steve.jakubiec@tdstelecom.com) (920-882-4166)
- G. Net-Lec (Mi-Tech Services), Dennis Lafave, (dlafave@mi-tech.us) (920-619-9774)
- H. CenturyLink, Relocation Team, (relocations@lumen.com) (800-871-9244)
- I. Central Brown County Water Authority, Rob Michaelson, (rmichaelson@mpu.org) (920-686-4354)

1.9 MISCELLANEOUS PROVISIONS

- A. Notification to Residents – notify individually all residents 2-weeks prior to the start of operations, giving an estimated time that vehicle movement will be limited or prohibited. Property owners shall be notified 24-hours prior to closing a drive.
- B. Ingress and egress to the site of work for the delivery of materials, hauling of excavation, daily construction activities and all vehicular traffic shall be from Grant Street (CTH EE). No truck traffic is allowed through VFW Park to access the site.

- C. Work is currently designed such that only a parking lane is impacted along Grant Street (CTH EE). Provide a minimum two-week notice should the travel lanes on Grant Street need to be further reduced to accommodate work. Any further reduction in travel lanes will result in flaggers needing to be present on Grant Street to manage traffic. No work is permitted in the travel lanes prior to 9:00 AM or between the hours of 3:00 PM and 6:00 PM when school is in session.
- D. Community Center traffic will be detoured by the City through the VFW Park & Aquatic Facility entrance west of the project site.
- E. Storm sewer relay work shall be scheduled during dry or frozen periods when residual flow is at a minimum. If there is precipitation scheduled while storm sewer relay work is ongoing, bypass pumping will be required. Overnight bypass pumping will require a noise ordinance permit through the De Pere Department of Public Works.
- F. Sanitary sewage shall be bypass-pumped to accommodate work. Overnight bypass pumping will require a noise ordinance permit through the De Pere Department of Public Works. Along Grant Street, the sanitary sewer is located in the parking lane and it is not anticipated that bypass pumping equipment would interfere or cross travel lanes.

PART 2 – PRODUCTS

PART 3 – EXECUTION

END OF SECTION

SECTION 01 22 01

MEASUREMENT AND PAYMENT SANITARY SEWER

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:	<u>Bid Item No.</u>
1. Sanitary Sewer Mains (Granular Backfill)	SS-01, SS-03, SS-05 & SS-07
2. Sanitary Sewer Mains (Natural Backfill)	SS-02, SS-04 & SS-06
3. Sanitary Sewer Laterals	SS-08
4. Sanitary Sewer Service Branches	SS-09
5. Sanitary Sewer Manholes	SS-10, SS-11 & SS-12
6. Connect to Existing Sanitary Sewer Pipe	SS-13
7. Connect to Existing Sanitary Sewer Manhole	SS-14
8. Dig Down and Verify Sanitary Sewer Pipe	SS-15
9. Abandon/Remove Sanitary Sewer & Appurtenances	SS-16

B. Unit Prices include:

1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all unit price items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but is required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
2. The method of measurement for payment.
3. The price per unit for payment.

1.2 GENERAL WORK ITEMS

- A. Include with the appropriate Unit Price Item the following work items which are common to the Unit Price Items for sanitary sewer systems.
- B. If there is a specific Unit Price Item for any of the following items, then the work item shall be included with that specific unit price item.
 1. Traffic Control.
 2. Sawcutting asphalt and/or concrete.
 3. Removal, hauling and disposal of surface materials including road pavement, curb and gutter, sidewalk, driveways and other pavement surfaces in the trench area and as shown on the drawings.
 4. Dewatering.
 5. Bypass pumping.
 6. Excavation.
 7. Open Trench installation method (unless bid item specifies other method).

8. Pipe Bedding.
9. Backfilling and compacting native obtained from the excavation.
10. Supplying, hauling, backfilling and compacting granular material.
11. Loading, hauling and disposing of surplus excavated material.
12. Landscaping – turf establishment surface restoration and trees and bushes damaged during construction.
13. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site beyond the limits identified.
14. Site access requirements including temporary aggregate material as required for local traffic access.
15. Bulkhead and abandoned existing sanitary sewer with flowable fill as shown on Drawings.
16. If crossing or undermining of existing public or private utility, then include:
 - a. Maintaining the utility in service.
 - b. Replacing of existing utilities, if damaged.
 - c. Providing support and bedding material.
17. Dust control.
18. Remove and replace existing mailboxes and traffic signs.
19. Restroom facilities.
20. Easement and right-of-way requirements.
21. Construction staking and other survey work not provided by the Engineer.
22. Regulatory requirements.
23. Preconstruction videotaping and video equipment.
24. Quality assurance and quality control testing and inspections.
25. Shop drawings and other submittals.

1.3 SANITARY SEWER MAINS (GRANULAR BACKFILL)

- A. The unit price for Sanitary Sewer Main (Granular Backfill) work includes:
 1. General Work Items of Article 1.2.
 2. Sanitary sewer pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
 3. Excavation, breakdown and removal of abandoned piping inside the trench area, including plugging of existing connections.
 4. Excavation, breakdown and removal of abandoned pipeline structures inside the trench area, including plugging of existing connections.
 5. Clay anti-seepage collar around pipe.
- B. Measurement of payment will be the actual horizontal length along the centerline of the installed sewer from centerline of the manhole to centerline of manhole with no deductions for manholes, sewer services branches and other fittings.
- C. The unit of measurement for payment is linear feet.

1.4 SANITARY SEWER MAINS (NATURAL BACKFILL)

- A. The unit price for Sanitary Sewer Main (Natural Backfill) work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Sanitary sewer pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
 - 3. Excavation, breakdown and removal of abandoned piping inside the trench area, including plugging of existing connections.
 - 4. Excavation, breakdown and removal of abandoned pipeline structures inside the trench area, including plugging of existing connections
- B. Measurement of payment will be the actual horizontal length along the centerline of the installed sewer from centerline of the manhole to centerline of manhole with no deductions for manholes, sewer services branches and other fittings.
- C. The unit of measurement for payment is linear feet.

1.5 SANITARY SEWER LATERALS

- A. The unit price for Sanitary Sewer Laterals work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Sanitary sewer lateral pipe and fittings of the material stated in the Unit Price Bid Schedule and installed using the open trench method.
 - 3. Watertight plug in the end of the sewer service lateral or connection including transition coupling to the existing building sewer lateral.
 - 4. Tracer wire.
 - 5. Install an 8' – 4" X 4" board at the end of the lateral.
- B. Measurement of payment will be the actual horizontal length along the centerline of the installed sewer service lateral pipe (excluding risers) from centerline of the service branch to the end of the pipe at the right of way, easement or existing sewer service lateral with no deductions for fittings.
- C. The unit of measurement for payment is linear feet.

1.6 SANITARY SEWER SERVICE BRANCHES

- A. The unit price for Sanitary Sewer Service Branches work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Sanitary sewer service branches of same material strength or better than sanitary sewer main pipe.
 - 3. Installation along with the sanitary sewer main pipe installation.
 - 4. Plug (where required).

- B. Measurement for payment will be the actual number installed.
- C. The unit of measurement for payment is each.

1.7 SANITARY SEWER MANHOLES

- A. The unit price for Sanitary Sewer Manholes work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Precast reinforced concrete components.
 - 3. Joint flexible gasket material.
 - 4. Resilient flexible connector between the manhole structure and the sewer pipe.
 - 5. Adjusting rings and bituminous plastic cement sealant at chimney.
 - 6. Manhole steps.
 - 7. Manhole frame and cover (Neenah Foundry R-1500 Manhole Cover with Non-Rocking Lid or equal). Sanitary Sewer manhole covers shall have gaskets and concealed pick holes.
 - 8. Bedding material.
 - 9. Sewer pipe stub with connections and watertight plug (where required).
 - 10. Final casting adjustment.
- B. Measurement for payment will be the distance from the invert of the lowest sewer to the top of the frame and cover as set.
- C. The unit of measurement for payment is vertical feet.

1.8 CONNECT TO EXISTING SANITARY SEWER PIPE

- A. The unit price for Connect to Existing Sanitary Sewer Pipe work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Sanitary Sewer Pipe same material strength or better than sewer main. Provide Fernco with stainless steel sheer bands and connection water tight seal.
 - 3. Backfilling and compacting.
- B. Measurement for payment will be the actual number completed.
- C. The unit of measurement for payment is each.

1.9 CONNECT TO EXISTING SANITARY SEWER MANHOLE

- A. The unit price for Connect to Existing Sanitary Sewer Manhole work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Connect to existing sanitary sewer manhole (where required).
 - 3. Install A-Lok boot, reuse existing boot or block and mortar with tar to provide watertight seal.
 - 4. Reform flow line in existing sanitary manhole.

- B. Measurement for payment will be the actual number complete.
- C. The unit of measurement for payment is each.

1.10 DIG DOWN AND VERIFY SANITARY SEWER PIPE

- A. The unit price for Dig Down and Verify Sanitary Sewer Pipe work includes:
 - 1. General work items of Article 1.2.
 - 2. Excavate down to existing sanitary sewer pipe to expose the existing lateral to verify the pipe depth and if the pipe is active.
 - 3. City staff will dye test or camera the pipe if needed.
 - 4. Backfilling and compacting.
- B. Measurement for payment will be the actual number completed.
- C. The unit of measurement for payment is each.

1.11 ABANDON/REMOVE SANITARY SEWER & APPURTENANCES

- A. The unit price for Abandon/Remove Sanitary Sewer and Appurtenances work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Excavating.
 - 3. Install caps or bulkheads and abandon sewer line.
 - 4. Internal lining in lieu of capping of lateral connections to sanitary sewer mains (where applicable).
 - 5. Removing existing sanitary sewer where in conflict with other utilities.
 - 6. Providing and placing flowable fill (were required on the plan sheets).
 - 7. Backfilling and compacting.
 - 8. Removal and disposal of appurtenances as shown on the Drawings.
- B. Measurement for payment will not be made. This includes all of the project area.
- C. The unit of measurement for payment is lump sum.

END OF SECTION

SECTION 01 22 02

MEASUREMENT AND PAYMENT STORM SEWER

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:	<u>Bid Item No.</u>
1. Storm Sewer Mains (Granular Backfill)	ST-01, ST-03, ST-09, ST-11 & ST-13
2. Storm Sewer Mains (Natural Backfill)	ST-02, ST-04, ST-05, ST-06, ST-07, ST-08, ST-10, ST-12 & ST-14
3. Storm Sewer Branches	ST-15, ST-16 & ST-17
4. Storm Sewer Manholes	ST-18, ST-19, ST-20, ST-21 & ST-22
5. Catch Basin/Inlets	ST-23
6. Connect to Existing Storm Sewer Pipe	ST-24, ST-25 & ST-26
7. Dig Down and Verify Storm Sewer Pipe	ST-27
8. Abandon/Remove Storm Sewer and Appurtenances	ST-28

- B. Unit Prices include:
1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all unit price items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but is required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
 2. The method of measurement for payment.
 3. The price per unit for payment.

1.2 GENERAL WORK ITEMS

- A. Include with the appropriate Unit Price Item the following work items which are common to the Unit Price Items for storm sewer systems.
- B. If there is a specific Unit Price Item for any of the following items, then the work item shall be included with that specific unit price item.
1. Traffic Control.
 2. Sawcutting asphalt and/or concrete.
 3. Removal, hauling and disposal of surface materials including road pavement, curb and gutter, sidewalk, driveways and other pavement surfaces in the trench area and as shown on the drawings.
 4. Dewatering.
 5. Excavation.
 6. Open trench installation method (unless bid item specifies other method).
 7. Pipe bedding.

8. Backfilling and compacting native obtained from the excavation.
9. Supplying, hauling, backfilling and compacting granular material.
10. Loading, hauling and disposing of surplus excavated material.
11. Landscaping – turf establishment surface restoration and trees and bushes damaged during construction.
12. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site beyond the limits identified.
13. Site access requirements including temporary aggregate material as required for local traffic access.
14. Bulkhead and abandon existing storm sewer with flowable fill as shown on drawings.
15. If crossing or undermining of existing public or private utility, then include:
 - a. Maintaining the utility in service.
 - b. Replacing of existing utilities, if damaged.
 - c. Providing support and bedding material.
16. Dust control.
17. Remove and replace existing mailboxes and traffic signs.
18. Restroom facilities.
19. Easement and right-of-way requirements.
20. Construction staking and other survey work not provided by the Engineer.
21. Regulatory requirements.
22. Preconstruction videotaping and video equipment.
23. Quality assurance and quality control testing and inspections.
24. Shop drawings and other submittals.

1.3 STORM SEWER MAINS (GRANULAR BACKFILL)

- A. The unit price for Storm Sewer Main (Granular Backfill) work includes:
 1. General Work Items of Article 1.2.
 2. Storm sewer pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
 3. Excavation, breakdown and removal of abandoned piping inside the trench area, including plugging of existing connections.
 4. Excavation, breakdown and removal of abandoned pipeline structures inside the trench area, including plugging of existing connections.
- B. Measurement of payment will be the actual horizontal length along the centerline of the installed sewer from centerline of the manhole to centerline of manhole with no deductions for manholes, sewer services branches and other fittings.
- C. The unit of measurement for payment is linear feet.

1.4 STORM SEWER MAINS (NATURAL BACKFILL)

- A. The unit price for Storm Sewer Main (Natural Backfill) work includes:

1. General Work Items of Article 1.2.
2. Storm sewer pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
3. Excavation, breakdown and removal of abandoned piping inside the trench area, including plugging of existing connections.
4. Excavation, breakdown and removal of abandoned pipeline structures inside the trench area, including plugging of existing connections.

B. Measurement of payment will be the actual horizontal length along the centerline of the installed sewer from centerline of the manhole to centerline of manhole with no deductions for manholes, sewer services branches and other fittings.

C. The unit of measurement for payment is linear feet.

1.5 STORM SEWER BRANCHES

A. The unit price for Storm Sewer Branches work includes:

1. General Work Items of Article 1.2.
2. Storm sewer service branches or inserta tees of same material strength or better than storm sewer main pipe (where required).
3. Core drilling into concrete storm sewer main (where required).
4. Installation along with the storm sewer main pipe installation.
5. Plug (where required).

B. Measurement for payment will be the actual number installed.

C. The unit of measurement for payment is each.

1.6 STORM SEWER MANHOLES

A. The unit price for Storm Sewer Manholes work includes:

1. General Work Items of Article 1.2.
2. Precast reinforced concrete components.
3. Joint flexible gasket material.
4. Grout seal between the manhole and structure and the sewer pipe.
5. Adjusting rings and bituminous plastic cement sealant at chimney.
6. Manhole steps.
7. Manhole frame and cover.
8. Bedding material.
9. Sewer pipe stub with connections and watertight plug (where required).
10. Final casting adjustment.

B. Measurement for payment will be the distance from the invert of the lowest sewer to the top of the frame and cover as set.

C. The unit of measurement for payment is vertical feet.

1.7 CATCH BASIN/INLETS

A. The unit price for Catch Basin/Inlets work includes:

1. General Work Items of Article 1.2.
2. Precast reinforced concrete components.
3. Joint flexible gasket material.
4. Grout seal between the catch basin/inlet structure and the sewer pipe.
5. Adjusting rings grouted in place.
6. Casting frame and grate.
7. Bedding material.
8. Supply and install 6 to 10 feet of 4 inch flexible perforated plastic pipe with geotextile wrap subgrade drain.
9. Sand fill and Class "B" concrete floor and flow line.
10. Temporary cover over catch basin/inlet to prevent eroded materials from entering.
11. Final casting adjustment.

B. Measurement for payment will be the actual number installed.

C. The unit of measurement for payment is each.

1.8 CONNECT TO EXISTING STORM SEWER PIPE

A. The unit price for Connect to Existing Storm Sewer Pipe work includes:

1. General Work Items of Article 1.2.
2. Storm sewer pipe same material strength or better than sewer main.
3. Provide Fernco with stainless steel sheer bands and connection water tight seal (where applicable).
4. Block and mortar to provide watertight seal (where applicable).
5. Portland cement concrete collar (where applicable).
6. Bends as required in the field.
7. Backfilling and compaction.

B. Measurement for payment will be the actual number complete.

C. The unit of measurement for payment is each.

1.9 DIG DOWN AND VERIFY STORM SEWER PIPE

A. The unit price for Dig Down and Verify Storm Sewer Pipe work includes:

1. General work items of Article 1.2.
2. Excavate down to existing storm sewer pipe to expose the existing pipe to verify the depth of the pipe and if it is active.

3. City staff will dye test and/or camera the pipe if needed.
4. Backfilling and compacting.

B. Measurement for payment will be the actual number completed.

C. The unit of measurement for payment is each.

1.10 ABANDON/REMOVE STORM SEWER AND APPURTENANCES

A. The unit price for Abandon/Remove Storm Sewer and Appurtenances work includes:

1. General Work Items of Article 1.2.
2. Excavating
3. Install bulkheads and abandon storm sewer and/or structures.
4. Removing existing storm sewer and/or structures as directed on the plans or where in conflict with other utilities.
5. Providing and placing blow sand.
6. Backfilling and compacting.
7. Removal and disposal as shown on the Drawings.

B. Measurement for payment will not be made. This includes all of the project area.

C. The unit of measurement for payment is lump sum.

END OF SECTION

SECTION 01 22 04

MEASUREMENT AND PAYMENT STREET AND DRAINAGE CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

- | A. Section includes: | <u>Bid Item No.</u> |
|---|----------------------|
| 1. Clearing and Grubbing | SD-01 |
| 2. Crushed Aggregate Base and Surface Course | SD-02 |
| 3. Asphaltic Concrete Pavement | SD-03 & SD-04 |
| 4. Portland Cement Concrete Pavement | SD-05 |
| 5. Portland Cement Concrete Curb and Gutter | SD-06 & SD-07 |
| 6. Portland Cement Concrete Driveway, Ramp and Sidewalk | SD-08 & SD-09 |
| 7. Deformed Reinforcement Bars | SD-10 |
| 8. Drilling Tie Bars and Dowel Bars | SD-11, SD-12 & SD-13 |
| 9. Detectable Warning Field Natural | SD-14 |
| 10. Portland Cement Concrete Flume | SD-15 |
| 11. Landscaping – Topsoil, Seed, Fertilize, and Mulch | SD-16 |
- B. Unit Prices include:
1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all unit price items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but is required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
 2. The method of measurement for payment.
 3. The price per unit for payment.

1.2 GENERAL WORK ITEMS

- A. Include with the appropriate Unit Price Item the following work items which are common to the Unit Price Items for street and drainage systems.
- B. If there is a specific Unit Price Item for any of the following items, then the work item shall be included with that specific unit price item.
1. Traffic Control.
 2. Sawcutting asphalt and/or concrete.
 3. Removal, hauling and disposal of surface materials including road pavement, curb and gutter, sidewalk, driveways and other pavement surfaces in the trench area and as shown on the drawings.
 4. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site.

5. Site access requirements including temporary aggregate material as required for local traffic access.
6. Dust control.
7. Remove and replace existing mailboxes and traffic signs.
8. Restroom facilities.
9. Construction staking and other survey work not provided by the Engineer.
10. Regulatory requirements.
11. Quality assurance and quality control testing and inspections.
12. Final casting and valve box adjustment.
13. Shop drawings and other submittals.

1.3 CLEARING AND GRUBBING

- A. The unit price for Clearing and Grubbing work includes:
1. General Work Items of Article 1.2.
 2. Cutting and disposing of trees, brush, windfalls, logs and other vegetation.
 3. Removing and disposing of roots, stumps, stubs, logs and other timber.
 4. Stripping and stockpiling topsoil.
- B. Measurement for payment will not be made.
- C. The unit of measurement for payment is lump sum.

1.4 CRUSHED AGGREGATE BASE AND SURFACE COURSE

- A. The unit price for Crushed Aggregate Base and Surface Course work includes:
1. General Work Items of Article 1.2.
 2. Aggregate material.
 3. Preparation of foundation.
 4. Placing and compacting to thickness and width shown on the Drawings or specified elsewhere.
 5. Maintenance until surface pavement is constructed.
 6. Preparation of crushed aggregate base for paving.
 7. Adjustment of manholes and valve boxes to proposed finish road grade.
- B. Measurement of payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered and the project name. Aggregates in excess of seven percent (7%) total moisture determined based on the dry mass of the aggregates will have moisture content in excess of seven percent (7%) deducted from the measured weight.
- C. The unit of measurement for payment is tons.

1.5 ASPHALTIC CONCRETE PAVEMENT

- A. The unit price for Asphaltic Concrete Pavement work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Asphaltic concrete mixture, tack coat and other required materials
 - 3. Surface preparation.
 - 4. Provide tack coat on base material.
 - 5. Saw cutting and/or mill adjacent and abutting pavement surfaces.
 - 6. Asphaltic concrete placement and compaction to thickness and width shown on the drawings or specified elsewhere.
 - 7. Tack coat between asphaltic concrete courses and abutting pavements.

- B. Measurement for payment will be the actual amount of material required and incorporated in the work verified by submitting to the Engineer delivery tickets provided with each load showing the weight measured on a certified scale, type of material, the date delivered and the project name.

- C. The Unit Price shall be adjusted for deficiencies for less than minimum density represented by the average lot density of five nuclear density tests of 750 tons of asphaltic concrete placed as shown in the following table:

Density Deficiency-Percent of Unit Price for Payment	
%Lot Density Below Specified Minimum	WisDOT Mixes
From 0.5-1.0 inclusive	98%
From 1.1-1.5 inclusive	95%
From 1.6-2.0 inclusive	91%
From 2.1-2.5 inclusive	85%
From 2.6-3.0 inclusive	70%
More than 3.0	0%

- D. The unit of measurement for payment is tons.

1.6 PORTLAND CEMENT CONCRETE PAVEMENT

- A. The unit price for Portland Cement Concrete Pavement work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Furnish all labor, tools, equipment and services.
 - 3. Providing Portland cement concrete mixture of thickness shown in the drawings or specified elsewhere.
 - 4. Surface preparation.
 - 5. Providing reinforcement including tie bars and dowel bars.
 - 6. Drilling tie bars and dowel bars into existing pavement.
 - 7. Joint sealing.

8. Providing curing.
9. Concrete sealing with linseed oil.
10. Fine grading of subgrade.
11. Providing expansion joints and contraction joints.
12. Adjustment of manholes, water valves, inlets/catch basin and other structures to finish grade.
13. Finishing.
14. Protection.

B. Measurement for payment will be length and width of areas paved. Concrete curb and gutter will be measured separately, regardless if the curb is installed with integral curb. Curb and gutter will be paid per linear foot for twenty-four (24) inch width. The width and length will be subtracted from the concrete pavement area if integral curb is constructed.

C. The unit of measurement for payment is square yard.

1.7 PORTLAND CEMENT CONCRETE CURB AND GUTTER

A. The unit price for Portland Cement Concrete Curb and Gutter work includes:

1. General Work Items of Article 1.2.
2. Providing Portland cement concrete mixture of size shown in the drawings or specified elsewhere.
3. Providing expansion joints.
4. Providing curing.
5. Existing curb and gutter removal.
6. Subgrade preparation.
7. Provide crushed aggregate base.
8. Fine grading of subgrade.
9. Providing contraction joints.
10. Driveway entrances and handicap ramp entrances.
11. Adjustment of catch basin/inlets.
12. Finishing.
13. Protection.
14. Restoration behind the curb.

B. Measurement for payment will be along the flow line of the gutter and through inlets/catch basins.

C. The unit of measurement for payment is linear feet.

1.8 PORTLAND CEMENT CONCRETE DRIVEWAY AND SIDEWALK

A. The unit price for Portland Cement Concrete Sidewalk and Driveway work includes:

1. General Work Items of Article 1.2.

2. Providing Portland cement concrete mixture of thickness shown in the drawings or specified elsewhere.
3. Providing reinforcement.
4. Providing expansion joint.
5. Providing curing.
6. Existing pavement removal.
7. Subgrade preparation.
8. Providing contraction joints.
9. Handicap ramps.
10. Sidewalk steps.
11. Saw cutting adjacent surfaces.
12. Finishing.
13. Protection.
14. Restoration.

B. Measurement for payment will be the average horizontal length and width of the concrete placed.

C. The unit of measurement for payment is square yards.

1.9 DEFORMED REINFORCEMENT BARS

A. The unit price for Deformed Reinforcement Bars work includes:

1. General Work Items of Article 1.2.
2. Supply and install two - #4 deformed reinforcement bars over all trenches that fall under any portion of the concrete curb and gutter, sidewalk, and driveway being constructed.

B. Measurement for payment will be the horizontal length of each bar installed.

1. This item applies to concrete curb and gutter, sidewalk, and driveway.
2. This item does not apply to concrete pavement and patches.

C. The unit of measurement for payment is linear feet.

1.10 DRILLING TIE BARS AND DOWEL BARS

A. The unit price for Drilling Tie Bars and Dowel Bars work includes:

1. General Work Items of Article 1.2.
2. Providing and installing tie bars and dowel bars, including coating.
3. For drilling holes in concrete not placed under the contract.
4. For epoxying or driving.

B. Measurement for payment will be the actual number of bars installed.

C. The unit of measurement for payment is each.

1.11 DETECTABLE WARNING FIELD NATURAL

- A. The unit price for Detectable Warning Field Natural work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Providing and installing Detectable Warning Field per ADA requirements.
 - 3. Each detectable warning field shall be two (2) feet by four (4) feet.
- B. Measurement for payment will be the actual number of detectable warning field installed.
- C. The unit of measurement for payment is each.

1.12 PROVIDE CONCRETE FLUME

- A. The unit price for Provide Concrete Flume work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Furnish all labor, tools, equipment and services.
 - 3. Providing Portland cement concrete mixture of thickness shown in the drawings.
 - 4. Surface preparation.
 - 5. Joint sealing.
 - 6. Providing curing.
 - 7. Concrete sealing with linseed oil.
 - 8. Fine grading of subgrade.
 - 9. Providing expansion joints and contraction joints.
 - 10. Finishing.
 - 11. Protection.
- B. Measurement for payment will be the average horizontal length and width of the concrete placed.
- C. The unit of measurement for payment is square yards.

1.13 LANDSCAPING- TOPSOIL, SEED, FERTILIZE AND MULCH

- A. The unit price for Landscaping- Topsoil, Seed, Fertilize, and Mulch work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Provide 4" topsoil or salvaged topsoil.
 - 3. Provide seed.
 - 4. Provide fertilizer.
 - 5. Provide mulch.
 - 6. Provide maintenance.
- B. Measurement for payment will be the width and length not greater than the road right-of-way, not greater than the easement and not greater than fifteen (15) feet beyond the top of either side of ditches outside the right-of-way.

C. The unit of measurement for payment is square yard.

END OF SECTION

SECTION 01 22 05

MEASUREMENT AND PAYMENT SPECIAL CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

- | | |
|--|---------------------|
| A. Section includes: | <u>Bid Item No.</u> |
| 1. Pipe Foundation Stabilization | SC-01 |
| 2. Inlet Protection Erosion Control | SC-02 & SC-03 |
| 3. Remove, Salvage and Reinstall Sign | SC-04 |
| 4. Remove, Salvage and Reinstall Fence | SC-05 |
| 5. Traffic Control | SC-06 |
- B. Unit Prices include:
1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all unit price items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but is required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
 2. The method of measurement for payment.
 3. The price per unit for payment.

1.2 GENERAL WORK ITEMS

- A. Include with the appropriate Unit Price Item the following work items which are common to the Unit Price Items for special construction.
- B. If there is a specific Unit Price Item for any of the following items, then the work item shall be included with that specific unit price item.
1. Traffic Control.
 2. Loading, hauling and disposing of surplus material.
 3. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site beyond the limits identified.
 4. Dust control.
 5. Restroom facilities.
 6. Construction staking and other survey work not provided by the Engineer.
 7. Regulatory requirements.
 8. Quality assurance and quality control testing and inspections.
 9. Shop drawings and other submittals.

1.3 PIPE FOUNDATION STABILIZATION

- A. The unit price for Pipe Foundation Stabilization work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Excavation below the limits of the pipe bedding with the bottom of the excavation wider than the top with 1:1 side slopes.
 - 3. Dewatering.
 - 4. Soil Class A-7 or A-8 aggregate material.
 - 5. Loading, hauling and disposing of surplus excavated material.

- B. Measurement of payment will be the volume calculated based on:
 - 1. The actual depth from four (4) inches below the bottom of pipe to the bottom of the aggregate material placed.
 - 2. The bottom width is the actual width not to exceed the pipe outside diameter plus twenty-four (24) inches plus 1:1 side slopes.
 - 3. The top width is the pipe outside diameter plus twenty-four (24) inches.

- C. The unit of measurement for payment is cubic yards.

1.4 INLET PROTECTION EROSION CONTROL

- A. The unit price for Inlet Protection Erosion Control work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Provide geotextile and wood materials for type shown on the Drawings.
 - 3. Placing inlet protection system.
 - 4. Inspection and maintenance of the installed inlet protection.
 - 5. Removal of the inlet protection.
 - 6. Cleaning debris buildup around inlet.

- B. Measurement for payment will be actual number of inlet protection erosion control installed.

- C. The unit of measurement for payment is each.

1.5 REMOVE, SALVAGE AND REINSTALL SIGN

- A. The unit price for Remove, Salvage and Reinstall Sign work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Protection, removal, and storage of existing sign onsite.
 - 3. Removal and replacement of sign footing once localized work is completed.
 - 4. Reinstallation of sign to match pre-existing conditions.

- B. Measurement for payment will not be made.

C. The unit of measurement for payment is lump sum.

1.6 REMOVE, SALVAGE AND REINSTALL FENCE

A. The unit price for Remove, Salvage and Reinstall Fence work includes:

1. General Work Items of Article 1.2.
2. Protection, removal, and storage of existing fence onsite.
3. Removal and replacement of fence footing once localized work is completed.
4. Reinstallation of fence to match pre-existing conditions.

B. Measurement for payment will not be made.

C. The unit of measurement for payment is lump sum.

1.7 TRAFFIC CONTROL

A. The unit price for Traffic Control work includes:

1. General Work Items of Article 1.2.
2. Providing, installing, maintain, and removing the Traffic Control signing and barricades as shown on the plans and per the MUTCD.
3. Traffic Detour, including covering signs when not in use.
4. Flaggers per the MUTCD.
5. Temporary traffic control signals (activated) per the MUTCD.
6. Sidewalk closure.

B. Measurement for payment will not be made.

1. This item applies to the specific bid items lists. All other traffic control is incidental to other items bid.

C. The unit of measurement for payment is for each intersection lump sum.

END OF SECTION

SECTION 01 22 10

MEASUREMENT AND PAYMENT ELECTRICAL

PART 1 – GENERAL

1.1 SUMMARY

- | | |
|--|---------------------|
| A. Section includes: | <u>Bid Item No.</u> |
| 1. Conduit | E-01 |
| 2. Concrete Bases | E-02 |
| 3. Electrical Wire Lighting | E-03 & E-04 |
| 4. Rewire Existing Light Pole | E-05 |
| 5. Remove, Salvage and Reinstall Existing Light Pole | E-06 |
- B. Unit Prices include:
1. Defined work for each Unit Price Item which will provide a functionally complete Project when combined with all unit price items. If there are specific work items which the Contractor believes are not identified in any Unit Price Item, but is required to provide a functionally complete Project, then the identified specific work items shall be included in the appropriate Unit Price Item.
 2. The method of measurement for payment.
 3. The price per unit for payment.

1.2 GENERAL WORK ITEMS

- A. Include with the appropriate Unit Price Item the following work items which are common to the Unit Price Items for electric and lighting systems.
- B. If there is a specific Unit Price Item for any of the following items, then the work item shall be included with that specific unit price item.
1. Traffic Control.
 2. Sawcutting asphalt and/or concrete.
 3. Removal, hauling and disposal of surface materials including road pavement, curb and gutter, sidewalk, driveways and other pavement surfaces in the trench area and as shown on the drawings.
 4. Excavation/plowing
 5. Backfilling and compacting native obtained from the excavation.
 6. Supplying, hauling, backfilling and compacting granular material.
 7. Loading, hauling and disposing of surplus excavated material.
 8. Landscaping – turf establishment surface restoration and trees and bushes damaged during construction.
 9. Maintenance, protection, replacement and/or repair of facilities not designated for alteration on the Site beyond the limits identified.

10. Restroom facilities.
11. Easement and right-of-way requirements.
12. Construction staking and other survey work not provided by the Engineer.
13. Regulatory requirements.
14. Preconstruction videotaping and video equipment.
15. Quality assurance and quality control testing and inspections.
16. Shop drawings and other submittals.

1.3 CONDUIT

- A. The unit price for Electrical Wire includes:
 1. General Work Items of Article 1.2.
 2. Providing and installing conduit for electrical wire.
 3. For providing all connectors.
- B. Measurement for payment will be by the linear foot.
- C. The unit of measurement for payment is linear feet.

1.4 CONCRETE BASES

- A. The unit price for Concrete Bases includes:
 1. General Work Items of Article 1.2.
 2. Providing, installing, and protecting the concrete base.
 3. For embedded conduit and electrical components.
 4. For furnishing and installing anchor rods, nuts, washers, ground electrodes, connections, conduit and fittings.
 5. For bar steel reinforcement, if required.
 6. For excavating, backfilling, and disposing of surplus materials, and restoring the site.
- B. Measurement for payment will be as each individual base.
- C. The unit of measurement for payment is by each.

1.5 ELECTRICAL WIRE LIGHTING

- A. The unit price for Electrical Wire Lighting includes:
 1. General Work Items of Article 1.2.
 2. Providing and installing the electrical wire and for making all connections.
 3. For providing all connectors, including wire nuts, fuses, fuse holders, splices, tape, insulating varnish or sealant, and for testing circuits.
 4. Verify all voltages drops does not exceed 3% and make sure connections meet local, state, and federal codes.
 5. Underground wiring shall be sized per load and code requirements.

- B. Measurement for payment will be by the linear foot, measured separately for each conductor.
- C. The unit of measurement for payment is linear feet.

1.6 REWIRE EXISTING LIGHT POLE

- A. The unit price for Rewire Existing Light pole includes:
 - 1. General Work Items of Article 1.2.
 - 2. Providing and installing the electrical wire and for making all connections.
 - 3. For providing all connectors, including wire nuts, fuses, fuse holders, splices, tape, insulating varnish or sealant, and for testing circuits.
 - 4. Verify all voltages drops does not exceed 3% and make sure connections meet local, state, and federal codes.
- B. Measurement for payment will not be made.
- C. The unit of measurement for payment is lump sum.

1.7 REMOVE, SALVAGE AND REINSTALL EXISTING LIGHT POLE

- A. The unit price for Remove, Salvage and Reinstall Existing Light Pole work includes:
 - 1. General Work Items of Article 1.2.
 - 2. Protection, removal, and storage of existing light pole onsite.
 - 3. Reinstallation of light pole upon new base as directed in the plans.
- B. Measurement for payment will be the actual number of light poles reinstalled.
- C. The unit of measurement for payment is each.

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes:

1. Administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

- A. Unit Price work will be the Schedule of Values used as the basis for reviewing Applications for Payment.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as recommended by the Engineer and approved by Owner.
- B. The date for each progress payment should be the 3rd Wednesday of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends the 4th Friday of the Month.
- C. Use forms provided by Engineer for Applications for Payment. Sample copy of the Application for Payment and Continuation Sheet is included in Section 00 62 76.
- D. Application Preparation Procedures
1. When requested by the Contractor, the Engineer will determine the actual quantities and classifications of Unit Price Work performed.
 - a. Preliminary determinations will be reviewed with the Contractor before completing Application for Payment.
 - b. Engineer will complete the Application for Payment based on Engineer's decision on actual quantities and classifications.
 - c. Engineer will submit three original copies of Application for Payment to Contractor for certification of all three original copies.
 - d. Contractor shall submit signed Application for Payment to Owner for approval within time frame agreed to at the Preconstruction Conference.
 2. If payment is requested for materials and equipment not incorporated in the Work, then the following shall be submitted with the Application for Payment:
 - a. Evidence that materials and equipment are suitably stored at the site or at another location agreed to in writing.

- b. A bill of sale, invoice, or other documentation warranting that the materials and equipment are free and clear of all liens.
 - c. Evidence that the materials and equipment are covered by property insurance.
 3. Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of Contractor.
- E. With each Application for Payment, submit waivers of liens from subcontractors and suppliers for the construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested before deduction for retainage on each item.
 2. When an application shows completion for an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work shall submit waivers.
 4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application.
 5. Submit waivers of lien on forms executed in a manner acceptable to Owner.
- F. The following administrative actions and submittals shall precede or coincide with submittal of first Application for Payment:
 1. List of subcontractors.
 2. Schedule of Values (For Lump Sum Work).
 3. Contractor's construction schedule.
- G. Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted including, but not limited, to the following:
 1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. Consent of Surety to Final Payment.
 5. Final lien waivers as evidence that claims have been settled.
 6. Final liquidated damages settlement statement.

PART 2 – PRODUCTS

PART 3 – EXECUTION

END OF SECTION

SECTION 01 32 33

CONSTRUCTION PHOTOGRAPHS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Photographs for utility construction sites.

1.2 SUBMITTALS

- A. Submit electronic files of each photographic view within seven (7) days of taking photographs.

1.3 QUALITY ASSURANCE

- A. Photographs are to be submitted to the Engineer for approval prior to the start of construction.

PART 2 – PRODUCTS

PART 3 – EXECUTION

3.1 UTILITY AND STREET CONSTRUCTION SITES

- A. Prior to start of construction provide sufficient photographs to adequately show the existing facilities and conditions within and adjacent to the construction Site to serve as a guide for final restoration including:
1. Roads including shoulders and/or curb and gutter.
 2. Sidewalks, parking areas, and driveways.
 3. Utility structures.
 4. Landscaping including signs, plantings, walls, fences, trees, shrubbery, etc.
 5. Mailboxes.
 6. Drainage facilities including culverts, inlets, ditches.
 7. Building structures.
- B. During construction provide sufficient photographs (a minimum of one per 100 feet of installed utility) to adequately show construction means, methods, and Site conditions including:
1. Crossings of other utilities.
 2. Exposure of existing structures.
 3. Soil conditions.

END OF SECTION

SECTION 01 33 00

SUBMITTALS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for submittals:
 - 1. Progress Schedule.
 - 2. Schedule of Shop Drawings and Sample Submittals.
 - 3. Shop Drawings.
- B. Failure to meet Submittal requirements to the satisfaction of the Engineer will constitute unsatisfactory performance of the work in accordance with the Contract Documents, therefore, the Engineer may recommend to the Owner that all or a portion of payments requested during the corresponding pay period be withheld until these requirements are met.

1.2 SUBMITTAL PROCEDURES

- A. Coordination: Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
 - 3. To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for re-submittals.
 - a. Allow two weeks for initial submittal.
 - b. Allow two weeks for reprocessing each submittal.
 - c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Assign a reference number to each submittal and re-submittal.
 - 2. Provide a space approximately four (4) by five (5) inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 - 3. Include the following information on the label for processing and recording action taken.

- a. Project name.
 - b. Date.
 - c. Name and address of the Engineer.
 - d. Name and address of the Contractor.
 - e. Name and address of the subcontractor.
 - f. Name and address of the supplier.
 - g. Name of the manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
4. Each submittal shall be stamped by the Contractor indicating that submittal was reviewed for conformance with the Contract Documents. The Engineer will not accept unstamped submittals.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal to the Engineer. The Engineer will not accept submittals received from sources other than the Contractor.
1. On the transmittal, record relevant information and requests for Engineer action. On a form, or separate sheet, record deviations from Contract Document requirements, including variations, limitations, and justifications. Include Contractor's certification that information complies with Contract Document requirements.

1.3 CONTRACTOR'S PROGRESS SCHEDULE

- A. Prepare and submit to the Engineer within 10 (ten) days after the Effective Date of the Agreement, four copies of a preliminary progress schedule of the work activities from Notice to Proceed until Substantial Completion.
1. Provide sufficient detail of the work activities comprising the schedule to assure adequate planning and execution of the work, such that in the judgment of the Engineer, it provides an appropriate basis for monitoring and evaluation of the progress of the work. A work activity is defined as an activity which requires substantial time and resources (manpower, equipment, and/or material) to complete and must be performed before the contract is considered complete.
 2. The schedule shall indicate the sequence of work activities. Identify each activity with a description, start date, completion date and duration. Include, but do not limit to the following items, as appropriate to this contract:
 - a. Shop drawing review by the Engineer.
 - b. Excavation and grading.
 - c. Asphalt and concrete placement sequence.
 - d. Restoration.
 - e. Construction of various segments of utilities.
 - f. Subcontractor's items of work.
 - g. Allowance for inclement weather.
 - h. Contract interfaces, date of Substantial Completion.
 - i. Interfacing and sequencing with existing facilities and utilities.

- j. Sequencing of major construction activities.
 - k. Milestones and completion dates.
- B. Distribution: Following response to the initial submittal, print and distribute copies of the revised construction schedule to the Engineer, Subcontractors, and other parties required to comply with scheduled dates. When revisions are made, distribute to the same parties. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.
- D. Punch List: Prepare and submit to the Engineer within ten (10) days after substantial completion a detailed progress schedule for outstanding work and punch list items.

1.4 SCHEDULE OF SHOP DRAWINGS AND SAMPLE SUBMITTALS

- A. Submit electronic or one (1) hard copy of preliminary submittal schedule in accordance with the General Conditions of the Contract and as follows:
- 1. Coordinate submittal schedule with the subcontractors, Schedule of Values, and of products as well as the Contractor's Progress Schedule.
 - 2. Prepare the schedule in chronological order. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category (Shop Drawings, Product Data, or Samples).
 - d. Name of the subcontractor.
 - e. Description of the part of the work covered.
 - f. Scheduled date for the Engineer's final release or approval.
- B. Distribution: Following response to the initial submittal, print and distribute copies of the revised construction schedule to the Engineer, Subcontractors, and other parties required to comply with scheduled dates. Post copies in the field office. When revisions are made, distribute to the same parties. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.5 SHOP DRAWINGS

- A. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or

copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

- B. Collect product data into a single submittal for each element of construction of system. Product data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 - 1. Mark each copy to show actual product to be provided. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
- C. Do not use shop drawings without an appropriate final stamp indicating action taken.
- D. Submittals: Submit electronic or one (1) hard copy of each required submittal. The Engineer will scan and return the submittal to the Contractor marked with action taken and corrections or modifications required.
- E. Distribution: Furnish copies of reviewed submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms. Maintain one copy at the project site for reference.
 - 1. Do not proceed with installation until a copy of the Shop drawing is in the Installer's possession.
 - 2. Do not permit use of unmarked copies of the Shop Drawing in connection with construction.

1.6 ENGINEER'S ACTION

- A. Except for submittals for the record or information, where action and return is required, the Engineer will review each submittal, mark to indicate action taken, and return promptly. The Engineer will stamp each submittal with a uniform action stamp. The Engineer will mark the stamp appropriately to indicate the action taken, as follows:
 - 1. "No Exceptions Taken": The work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.
 - 2. "Make Corrections Noted": The work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents.

3. "Amend and Resubmit": Do not proceed with work covered by the submittal. Resubmit without delay. Do not use, or allow others to use, submittals marked "Amend and Resubmit" at the Project Site or elsewhere where work is in progress.
 4. "Rejected – See Remarks": Do not proceed with work covered by the submittal. Resubmit without delay. Do not use, or allow others to use, submittals marked "Rejected and Resubmit" at the Project Site or elsewhere where work is in progress.
- B. Unsolicited Submittals: The Engineer will return unsolicited submittals to the sender without action.

PART 2 – PRODUCTS

PART 3 – EXECUTION

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Underground Utilities.
 - 2. Property Monuments.
 - 3. Traffic Control.
 - 4. Permits for Project.

1.2 UNDERGROUND UTILITIES

- A. Under the provisions of Wisconsin Statutes, Section 182.0175, all contractors, subcontractors, and any firm or individual intending to do work on this Contract shall contact all utility firms in the affected area of construction a minimum of three (3) working days prior to beginning construction so that affected utilities will be located and marked.

1.3 PROPERTY MONUMENTS

- A. Protect iron pipe monuments from movement.
- B. The cost of replacement of any monuments moved or destroyed during construction shall be the Contractor's responsibility.
- C. Perpetuation of destroyed or moved monuments shall be performed in accordance with state statutes by a registered land surveyor.

1.4 TRAFFIC CONTROL

- A. Provide traffic control facilities including barricades, signs, lights, warning devices, pavement markings, flaggers, etc.
- B. Construct and use traffic control facilities in accordance with the U.S. D. O. T. Federal Highway Administration's Manual on Uniform Traffic Control Devices for Streets and Highways.
- C. Maintain traffic control devices as required to properly safeguard the public travel through final completion, including during periods of suspension of work.

1.5 PERMITS FOR PROJECT

- A. The City will obtain a Brown County Lane Closure Permit for the work on Grant Street (CTH EE)

PART 2 – PRODUCTS (Not used)

PART 3 – EXECUTION (Not used)

END OF SECTION

SECTION 01 71 23

FIELD ENGINEERING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Engineering Surveys Provided by the Engineer.
 - 2. Engineering Surveys Provided by the Contractor.

1.2 SUBMITTALS

- A. None

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 PREPARATION

- A. Investigate and verify the existence and location of site improvements, utilities, and other existing facilities.
- B. Before construction, verify the location of invert elevations at points of connection of sanitary sewer, storm sewer, water piping and underground electrical services.
- C. Furnish information to the Engineer and the appropriate utility regarding conflicts that are necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction.
- D. Provide the Engineer two (2) working days advance notification when ready for engineering surveys for construction to be provided by the Engineer.

3.2 ENGINEERING SURVEYS TO BE PROVIDE BY THE ENGINEER

- A. General
 - 1. Establish benchmarks for construction as shown on the drawings.
 - 2. Establish control points as shown on the drawings.
- B. Gravity Sewer Systems and Water Distribution Systems
 - 1. Provide construction reference stakes set for pipe construction location at critical changes in horizontal and vertical alignment.

2. Provide construction stakes for location of pipe at connections.

C. New Road Construction

1. Provide construction slope intercept stakes for horizontal and vertical alignment on each side of the road base on each cross section in the cross section sheets for requests received at least seventy-two (72) hours before the related work begins.
2. Provide construction reference stakes for subgrade at a minimum of fifty (50) foot intervals and maximum of one-hundred (100) foot intervals on tangents. Provide construction reference stakes for subgrade at twenty-five (25) foot intervals within vertical and horizontal curves. Provide a reference line stake at each location.
3. Provide construction reference stakes for top of crushed aggregate at a minimum of fifty (50) foot intervals and maximum of one-hundred (100) foot intervals on tangents. Provide construction reference stakes for top of crushed aggregate at twenty-five (25) foot intervals within vertical and horizontal curves. Provide a reference or centerline stake.

3.3 ENGINEERING SURVEYS TO BE PROVIDED BY THE CONTRACTOR

A. General

1. Locate, preserve and protect established construction reference stakes, benchmarks and control points.
2. Locate, preserve and protect property corners and section corner monuments. If moved or destroyed due to Contractor negligence, then replace in accordance with state requirements; some of which are referenced in the "Regulatory Requirements".
3. Provide additional construction staking as necessary to complete construction based on the construction reference stakes provided by the Engineer and the Drawings.
4. Before beginning with necessary construction staking, verify the information shown on the Drawings, in relation to the established construction reference stakes, bench marks, control points and property corners. Notify the Engineer of any discrepancies.
5. Remove construction reference stakes when directed by the Engineer.

B. Gravity Sewer Systems and Water Distribution Systems

1. Provide any intermediate construction reference points as required to verify installation at the line and grade established and locate appurtenant structures.
2. Check the line and grade with construction reference stakes at each pipe length.

C. New Road Construction

1. Provide additional construction reference stakes necessary to establish location and grade in accordance with the plans.

END OF SECTION

SECTION 26 56 19

STREET LIGHTING

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Conduit
2. Pull Box 24x42-Inch
3. Concrete Bases
4. Electrical Wire Lighting
5. Electrical Service Meter Breaker Pedestal (Fortune Avenue)
6. Luminaires LED, 250 Watt equivalent
7. Poles, Type 5-Aluminum Anodized Black,
Traffic Signal Standards-Aluminum, factory applied black finish
Luminaire Arms Single Member, 4 ½-inch Clamp 8-FT, anodized black
Transformer Base Breakaway 11 ½-Inch Bolt Circle, anodized black with factory applied black finish
8. Luminaire Fixtures
9. Lighting Control Cabinet (120/240 Volt) (24" Width)

1.2 REFERENCES

- A. State of Wisconsin, Department of Transportation, Standard Specification for Highway and Structure Construction, current edition, and all supplemental and interim supplemental specifications, as they may pertain, except the items: method of measurement and basis of payment shall not apply.
- B. American Association of State Highway and Transportation Officials (AASHTO).

1.3 SUBMITTALS

- A. Submit manufacturer's certification for each product stated that products delivered comply with the requirements of this section and the referenced standard.
- B. Solid-State Light Fixture Product Checklist (See appendix)
- C. Luminaire specification sheet.
- D. Driver specification sheet.
- E. Surge protection specification sheet.

- F. IES LM-79 test report (include photometry and colorimetry). The photometry should be based on an actual working product, not a prototype or computer model.
- G. Performance (photometric) calculations. Use the following additional design parameters in conjunction with the plan and the information provided on the “Solid-State Light Fixture Product Checklist” to calculate photometric point-by-point analysis drawings for the street. Submit these calculations to the Engineer in a drawing size necessary to ensure legibility of each number on the roadway. These drawings shall accompany the solid-state light fixture specification sheet and driver specification sheet. Be sure to assign the road name to each applicable fixture type. Number all pages for reference during review. A .dwg or point file can be provided on request.
 - 1. Additional Parameters:
 - a) The new pavement is type R1.
 - b) Provide the photometric coverage required based on plan pole locations and spacing. Use .75 as a combined depreciation factor.
- H. Product warranty information identifying a minimum warranty of 10 years.
- I. Light levels anticipated at 30% life in accordance with LM79.

PART 2 – PRODUCTS

2.1 CONDUIT

- A. Conform to WisDOT Standard Specification for Highway and Structure Construction Section 652 for electrical conduit. The minimum conduit size is 2-inch.

2.2 PULL BOX 24x42-INCH

- A. Conform to WisDOT Standard Specification for Highway and Structure Construction Section 653 for Pull Boxes.

2.3 CONCRETE BASES

- A. Conform to WisDOT Standard Specification for Highway and Structure Construction Section 654 for Concrete Bases.

2.4 ELECTRICAL WIRE LIGHTING

- A. Conform to WisDOT Standard Specification for Highway and Structure Construction Section 655 for Electrical Wire Lighting.

2.5 ELECTRICAL SERVICE METER BREAKER PEDESTAL

- A. Furnish a service having a meter breaker pedestal in accordance with section 656.2.3 of the WisDOT specification and as the plans show.

2.6 POLES

- A. Include the following:
 - 1. Poles, Type 5-Aluminum Anodized Black
 - 2. Traffic Signal Standards
 - 3. Luminaire Arms Single Member, 4 ½-Inch Clamp 8-Ft, Anodized Black
 - 4. Transformer Base Breakaway 11 ½-Inch Bolt Circle, Anodized Black with Factory Applied Black Finish
 - 5. Pedestal Base, Anodized Black with Factory Applied Black Finish.
- B. Conform to WisDOT Standard Specification for Highway and Structure Construction Section 657 for poles, arms, standards, and bases. Poles and arms will be aluminum anodized black. Transformer bases and pedestal bases will be anodized black and have a factory applied black finish.

2.7 LUMINARIE FIXTURES

- A. The luminaire fixtures shall be one of the following:
 - 1. RVM-160W96LED4K-R-LE3-(VOLT)-DMG-[API-008]-RCD7-GY3 (0.85 Total LLF for design) from Phillips.
 - 2. BXUL9112& (STR-LWY-3M-HT-10-E-(VOLT)-SV-700-40K-7PIN-UTL(+)) (0.855 Total LLF for design) from CREE.
 - 3. GC1-80F-(VOLT)-NW-3-GY-700-PCR7-WISDOT-C-SC (0.855 Total LLF for design) from Leotek.
 - 4. ATB2-60B-LEDE10-VOLT-R2-P7-SH-RFD189565 (0.846 Total LLF for design) from American Electric Acuity Brands Lighting, Inc.
 - 5. NVN-AE-03-D-VOLT-T3R-10K 4N7-AP-WISDOT (0.85 Total LLF for design) from Cooper.
- B. LUMINAIRE MATERIALS
 - 1. General Requirements:
 - a. The luminaire manufacturer shall have produced LED street lighting luminaries for a minimum of 3 years at the time of bid.
 - b. Proposed products must be available, in full production, at the time of this project. Prototypes and conceptual products will not be accepted.
 - c. The manufacturer shall provide a warranty for 10 years (beginning on the date of substantial completion) for full replacement of fixture for catastrophic failure, or light levels below 70% of initially documented values excluding labor, tools, and miscellaneous materials with the following exception: Any documented light fixture failures exceeding 5% of the initial installed number of fixtures within the first 5 years shall afford the Owner the right to full replacement (including all necessary tools, labor, materials, traffic control, and incidentals necessary to bring the lighting system back to a complete and

operable system). The luminaire shall have a minimum 10 year warranty covering the entire luminaire (electronics, mechanical, finish). Knockdowns by the general public are excluded from manufacturer's responsibility. The warranty will begin on the date of substantial completion.

2. Mechanical Requirements:
 - a. Luminaire housing shall be made of cast or extruded aluminum, with low copper (<0.3%) alloys.
 - b. Heat sinking for the LEDs and electrical components shall be integral to the housing, with no moving or active parts (it should be a passive heat sink). It shall be shaped to maximize heat movement, and designed so that dirt and debris will not accumulate between fins or channels.
 - c. The luminaire shall include protection to keep birds from entering the housing.
 - d. There shall be a four-bolt mounting system accommodating 1.66" to 2.38" OD tenons. The housing shall be designed to allow installations at a tilt angle of +/- 5 degrees.
 - e. The luminaire shall have a minimum of 2G vibration rating per ANSI 136C.31. Situations requiring a 3G rating include bridges and overpasses.
 - f. The luminaire shall not weigh more than 40 pounds.
 - g. The luminaire shall operate in ambient temperatures of -40°C (-40°F) to +40°C (104°F).
 - h. The factory finish shall match the pole and may be anodized instead of painted. The finish must withstand extreme weather changes without cracking or peeling and be guaranteed for five full years or more.
3. LED (Light Source) Requirements:
 - a. The LEDs shall be from Cree, Phillips Lumileds, Nichia, or Osram.
 - b. The LED package shall be tested for a minimum of 6000 hours per IES LM-80-08.
 - c. The LEDs shall have a nominal correlated color temperature (CCT) between 4000 - 4500K.
 - d. The LEDs shall have a minimum color rendering index (CRI) of 70.
 - e. The projected L70 lifetime (the point in time at which the LEDs are expected to produce only 70% of their lumen output) for the luminaire shall be a minimum of 60,000 hours at 25° C.
4. Photometric Requirements:
 - a. The luminaire optics shall be available with IES Type II and III distributions.
 - b. Provide IES TM -15-07 optical precision for backlight, up light, and forward light (glare).
 - c. The luminaire shall deliver 65 lumens per watt (LPW) minimum at 530 mA drive current.
 - d. The optical portion of the luminaire must be protected to IP65 minimum, per ANSI C136.25, to prevent dirt and water from getting to the LED circuit board.
 - e. The luminaire shall have been photometrically tested per IES LM-79-08 by an independent laboratory, or an in-house laboratory with NIST NVLAP accreditation.
5. Electrical Requirements:
 - a. Provide all miscellaneous electrical components necessary to provide a complete and operable lighting system meeting local and National Electrical Code (NEC) requirements. All electrical components shall be UL listed for outdoor use.
 - b. Provide 120V system, Power Factor>90%, Total Harmonic Distortion<20%.

- c. The driver shall be available with input voltages ranges from 120-277 volts. Other installations may need to be available with dimming. Indicate if the fixture is compatible to be able to reduce light output by 50% and if there is an additional cost to provide.
- d. The driver, as operated in the luminaire, must not exceed the driver manufacturer's maximum case temperature limits for a rated life of at least 60,000 hours.
- e. The luminaire shall be protected against surges according to IEEE C62.42 C High (10kA and kV).
- f. The driver electronics shall be encapsulated and sealed to IP 65 rating. Drivers shall be easily accessible and removable without tools.
- g. The luminaire shall have a shorting cap.

2.8 LIGHTING CONTROL CABINET

- A. Furnish a lighting control cabinet in accordance with section 659 of the WisDOT specification together with the circuit wiring connections, hardware, and fittings as the plans show. Six 20 amp breakers will be required for the 2P branch breakers shown in the control cabinet schematic.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS LUMINARIES

- A. Luminaries
 - 1. Furnish and install luminaries and all necessary miscellaneous accessories and hardware to complete the installation of the luminaries.
 - 2. Follow manufacturer's instructions regarding luminaire installation.
 - 3. Three single-conductor No. 12 stranded wired shall be used to connect the luminaries to their respective branch conductors in the pole base. Each luminaire feeder wire shall be protected by one 5-amp fuse. Fuses and fuse holders shall be as per the details in the Plan.
 - 4. All exposed threaded equipment mounting hardware shall be stainless steel. All threaded stainless steel hardware and dissimilar metal, threaded hardware shall be coated with an approved zinc-based anti-seize compound (Loctite or Jet-Lube) by the Contractor.

END OF SECTION

APPENDIX A

CANADIAN NATIONAL UTILITY CROSSING/ENCROACHMENT APPLICATION PACKET



Utility Crossing/Encroachment Application Packet

Revised: 08/01/2023

Table of Contents

1. Initial Notification of Intent to Construct Utility Crossing/Encroachment
 - a. Requirements and Instructions
 - b. Forms
2. CN Insurance Requirements
3. Example Certificate of Insurance
4. Flagging/Cable Locate Specifications and Form

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

The Applicant shall submit a completed application for utility crossing engineering review to the appropriate contact shown in the “Pipeline/Wireline Utility Occupancy Contacts” Section on the subsequent page. The application can be downloaded from Railroad’s website, but the application and all supporting documentation must be submitted to the Railroad via USPS, UPS, or FedEx with tracking to the address shown on the application. Email submissions are acceptable but one (1) copy along with the application fee (unless otherwise specified by law) must be sent to the address listed in Section I. Any application transmitted to Railroad that does not include all requested information or required documentation will be considered incomplete. Railroad shall notify the applicant when Railroad receives an incomplete application but under no circumstances shall Railroad review an incomplete application. Repeat: no application will be reviewed until the application is complete. Any application which remains incomplete one (1) year after the date of the first notification of an incomplete submittal from Railroad will be cancelled and a new application must be submitted, including a new application fee. All information and documentation contained in any application must meet the approval of the Railroad, in its sole discretion. Unless otherwise required by law, Railroad will respond to all applications in the order in which they are received. **Note:** In no event shall any construction related activities be scheduled or conducted on Railroad’s property until Railroad has issued its final approval of the application, a written agreement outlining the legal terms of the installation has been signed and flaggers have been secured.

An application shall include the following documents:

- A cover letter which includes a project description.
- A completed and signed application form also known as Initial Notification of Intent Form.
- A map with an aerial image of the location of where work will be performed, showing the work site as well as nearby streets or other landmarks close to the work location(s).
- A certificate of insurance meeting the requirements set forth in this packet (unless lower coverage requirements are prescribed by local law and signed off by CN Legal Department).
- One (1) copy of complete stamped engineering plans which shall conform to the guidelines established by the American Railway Engineering and Maintenance of Way Association (AREMA), all applicable federal, state and local legal and professional requirements, CN standards and any additional requirements set forth in this packet. In the event of any conflict or inconsistency between the aforesaid guidelines, requirements and standards, the most stringent shall apply.
- All applications submitted should list the correct CN subsidiary throughout the application. Please refer to the attached System Map (page 32) to identify the subsidiary to refer to.
- The non-refundable application fee. Unless otherwise specified by law, the non-refundable application fee shall be \$1,350.00, which is intended to cover the cost of Railroad’s review of the application and all required documentation and information. The Applicant will be charged an additional fee of \$200 for each review after the initial review of the completed application due to inadequate or missing information or other failure by the Applicant to meet the requirements of Railroad. This fee shall be included with any revision sent. Any revision sent without the accompanying fee will be considered incomplete and will not be reviewed.
- If the project is for maintenance to an existing utility, please include a copy of the existing agreement.

**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

I. Pipeline/Wireline Utility Occupancy Contacts

UTILITIES

Address: CN Utilities – US
17641 South Ashland Avenue
Homewood, IL 60430

Email: CNUtilities_US@cn.ca

FLAGGING AND/OR CABLE LOCATES

Address: CN Flagging - US
17641 South Ashland Avenue
Homewood, IL 60430

Email: US_Flagging@cn.ca

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

II. Scope

1. These specifications cover minimum requirements for utilities installed within or adjacent to railway rights-of-way. Railroad reserves the right to increase the specifications based on physical conditions or other factors specific to the installation point, including but not limited to:
 - a. Track speed
 - b. Traffic density
 - c. Traffic sensitivity
 - d. Terrain conditions
 - e. Curvature and grade
 - f. Bridges and other structures
 - g. Pipe size, capacity and material carried
 - h. Environmental risks/damages

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

III. Engineering Plan Requirements

1. A cover page including:
 - a. Include caption stating "Construction and maintenance to be in accordance with all applicable regulatory requirements and standards"
 - b. Contact name, address and phone number of Utility Owner
 - c. Professional Engineer's stamp, signature, and date
2. A plan view or site plan displaying:
 - a. A north arrow
 - b. Any tracks and railroad facilities
 - c. Railroad/roadway crossings
 - d. Distance from Railroad Mile Post [no decimal] plus the feet beyond the Mile Post (EX. MP 2 + 1,200 ft.).
 - e. Proposed utility crossing location
 - f. Location of proposed utility crossing in relation to a legal description or road allowance
 - g. Public Land Survey System (PLSS) Information (sections, quarter sections, etc.)
 - h. Right of way lines of railroad and labeled street or highway, if involved
 - i. Warning, utility markers that are proposed for the site in accordance with this document.
 - j. Indicate direction of flow and location of nearest shut off valves, if shutoff valves are required.
 - k. Indicate location and distance of nearest excavation from centerline of nearest track.
 - l. Location and methods of storage and disposal of excavated material. Excavated material should be stored to the back side of excavation with respect to the tracks unless this position creates an unsafe condition or a better location can be justified. All excavated material should be treated as contaminated with details provided for review unless known otherwise.
 - m. Excavation protection methods shall be shown for review. All excavations must be protected at all times and fenced in with reflective material or illuminated if left unattended.
3. A profile along the proposed crossing of actual situations showing:
 - a. Any tracks
 - b. The existing ground surface
 - c. The proposed utility
 - d. *Exact* depth of burial below base of rail, roadway surface, ditch bottom, and other points of interest to the top of utility (depth measured to casing pipe, if used). Please do not use min/minimum when referring to the depth.
 - e. Method of installation (i.e. boring, dry jack and bore, dry directional bore, etc.)
 - f. Indicate type and details of utility protection.
4. Show a detailed spec and cross-section of the pipe including:
 - a. Note and show if carrier pipe will be held clear of the casing pipe by supports. CN requires carrier & casing to be designed for cooper E-80 loading.
 - b. The type, wall thickness, and maximum test pressures of carrier and casing pipes must be listed on the plans. CN requires the AREMA standard listed in *Table 1-5-1*. Minimum Wall Thickness for Steel Casing Pipe for E80 Loading also found in Section A-2 of this document.
 - c. Indicate type of cathodic protection, if required for the type of construction. (See AREMA Section 5.2.3.3 *Cathodic Protection* for more information)
 - d. The ends of the casing shall be suitably sealed to the outside of the carrier pipe or casing vents shall be required.

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

- e. Provide hoop stress calculation. See AREMA Sections 5.2.3 *Carrier Pipe* for more information.
- f. Cross sections of the utility shall be perpendicular to the center line of the railroads tracks.
- g. The location of the cross sections will be at:
 - i. Bore pit
 - ii. Receiving pit
 - iii. Intersection of utility and center line of any tracks
 - iv. Any other points of interest along the utility line
5. A detail of the proposed utility marker to be used on site showing all information to be displayed as well as all dimensions and materials.
6. Drawings must be to scale and have all dimensions shown. This includes but is not limited to:
 - a. Distance from each utility (encroachment) to the centerline of track, nearest road, crossing, bridge or other Railroad structures
 - b. Dimension width of CN right-of-way
 - c. Number of tracks proposed utility crossing will cross
 - d. Angle of proposed utility crossing
 - e. All existing and proposed signals and facilities with dimensions showing horizontal distance and depth to the proposed utility
7. All information regarding all seeding/surface restoration work shall be provided with the plans and conform to the local DOT specs.
8. Revised drawings shall be marked as revised (with revision date included) and state reason for revision. Each individual revision shall be called out in this manner. In addition, each page shall have a section near the title block with a list of revisions, where the revision version and date shall be marked in for any revision to that page.
9. **Professional Engineer's stamp, signature and date is required on all plans and submittals.**
10. Attachments to the plans as required in the following sections of this document may include but are not limited to:
 - a. Soil Boring Logs
 - b. Geotechnical Report
 - c. De-Watering Plan
 - d. Induction Interference Study
 - e. Vibration Monitoring Plan
 - f. Shoring Plan
 - g. Site Safety Action Plan
 - h. Emergency Action Plan
 - i. An estimated construction schedule and Gantt chart with field contact name and phone number.
 - j. Detailed Work Plan
 - k. Settlement Monitoring Plan
 - l. Construction Monitoring Plan

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

IV. Above Ground Utility Requirements

1. General Above Ground Utility Requirements

- a. CN's operations are not to be impaired or affected by any utility work.
 - i. Flagging protection during construction will be required and may be expanded by local supervisors to include any work on, under, over, or near Railroad property.
- b. All employees of contractors not hired by CN that will work on, over, under or near CN property are required to have, at a minimum, safety certification with www.contractororientation.com or an eRailsafe badge which has the CN logo on it. The railroad representative will be responsible for verifying and documenting said certifications.
 - i. Applicant must compile an Emergency Action Plan per OSHA which incorporates the proper Railroad contact information. Identify and list an adequate amount of properly trained employees to be able to enter CN property to respond to an emergency situation.
- c. On projects which have the potential to encroach or effect the operations to CN's property, it is required of the contractor to post informational documents at the jobsite for the benefit of the construction workers, CN personal, and the general public. The following required information is to be posted on a bulletin board. The bulletin board shall be weatherproof and watertight and be located in an area readily accessible to both CN and the general public.
 - i. Project overview: Including a general work description, job site location address, and approximate duration of the project
 - ii. Owner / Applicants Information
 - iii. Contractor's Designated points of contact: Including the Safety Officer, Superintendent, and 24-hour contact number
 - iv. Copies of reviewed drawings by CN
 - v. Copies of the Safety Action Plan
 - vi. Copies of approved permits
- d. All utilities must be a minimum of 15 ft horizontally away from any existing or planned CN signals and facilities, when practicable. Minimum distance in any direction from a vertical road crossing gate shall be no less than 4 ft.
- e. Utilities shall not be placed within a culvert, under railroad bridges, nor closer than 300 feet to any portion of any railroad bridge, building, or other structure, except in special cases and be of special design as approved by the CN Chief Engineer or the designated representative.
- f. Must not be attached to a CN pole line or pole lines licensed to others except where specifically authorized.
- g. All poles extending in height above ground equal to or greater than the distance from pole to the edge of ties on the nearest track will be anchored and guyed against tipping toward track.
 - i. Guys will be guarded to a distance of 8 ft above ground line and the guards shall be orange in color.
- h. All clearances and safety provisions are subject to the National Electric Safety Code (American National Standard Institute) as well as any applicable National, State, and local codes, whichever is more restrictive.
- i. All overhead electrical utilities will require an induction interference study.
- j. During construction, the Applicant shall maintain positive drainage of Railroad property. After construction is completed, the Railroad's right-of-way shall be restored to its original condition

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

and to the satisfaction of the Railroad. Any fencing removed to facilitate construction shall be restored.

- k. All piers or poles shall be located off of CN right-of-way.
- l. Warning, utility markers shall be installed at any intersection of any utility and CN right-of-way, and on any pole on CN right-of-way.

2. Above Ground Utility Crossing Requirements

- a. Utilities crossing over any railroad track must have a minimum height measured at the lowest point of the utility to the top of rail:
 - i. Pipe/Pipe Bridge = 25 ft. Min
 - a. Cable Supported Pipe Bridge = 50 ft.
 - ii. Conveyors = 25 ft. Min
 - iii. Fiber/Coaxial Cable = See Section A-3
 - iv. Electric Wire = See Section A-3
- b. Utilities shall be located, where practicable, to cross tracks at approximately right angles but must not cross at an angle less than 45 degrees.
 - i. Any utility crossing that is less than 45 degrees will be considered a longitudinal utility and may be subject to higher requirements as required by the CN Chief Engineer or the designated representative.
- c. If any new utilities are attached onto an existing structure, the existing structure must be analyzed to ensure it can withstand the new loading. If a re-design of the existing structure is required, this must be included with the plans.

3. Above Ground Longitudinal Utility Requirements

- a. All longitudinal utilities shall be placed towards the outer edge of the railroad right-of-way, except in special cases and be of special design as approved by the CN Chief Engineer or the designated representative.

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

V. Underground Utility Requirements

If underground utility is greater in diameter than 10" including any casing protection, the requirements in the Section VI (immediately following this section) are required.

1. General Underground Utilities Requirements

- a. CN's operations are not to be impaired or affected by any utility work.
 - i. Flagging protection during construction will be required and may be expanded by local supervisors to include any work on, under, over, or near Railroad property.
- b. All employees of contractors not hired by CN that will work on, over, under or near CN property are required to have, at a minimum, safety certification with www.contractororientation.com or an eRailsafe badge which has the CN logo on it. The railroad representative will be responsible for verifying and documenting said certifications.
 - i. Applicant must compile an Emergency Action Plan per OSHA which incorporates the proper Railroad contact information. Identify and list an adequate amount of properly trained employees to be able to enter CN property to respond to an emergency situation.
- c. On projects which have the potential to encroach or effect the operations to CN's property, it is required of the contractor to post informational documents at the jobsite for the benefit of the construction workers, CN personal, and the general public. The following required information is to be posted on a bulletin board. The bulletin board shall be weatherproof and watertight and be located in an area readily accessible to both CN and the general public.
 - i. Project overview: Including a general work description, job site location address, and approximate duration of the project
 - ii. Owner / Applicants Information
 - iii. Contractor's Designated points of contact: Including the Safety Officer, Superintendent, and 24-hour contact number
 - iv. Copies of reviewed drawings by CN
 - v. Copies of the Safety Action Plan
 - vi. Copies of approved permits
- d. Jacking or boring of corrugated metal pipe, cast iron pipe or pipe with flanges, bells or couplings will not be permitted.
- e. Casing may need to be extended to accommodate any proposed projects for Railroad as required by CN Chief Engineer or the designated representative.
- f. Soils investigation and a geotechnical report may be required.
- g. All underground utilities shall have an adequate casing for protection.
- h. Utilities shall not be placed within a culvert, under railroad bridges, nor closer than 100 feet to any portion of any railroad bridge, building, or other structure, except in special cases and be of special design as approved by the CN Chief Engineer or the designated representative.
- i. Restoration and backfill compaction should conform to a 95% Proctor test suitable for the soil type at the site and commence in lifts specified by the CN Chief Engineer or the designated representative.
- j. No excavation can be closer than 25 ft. from the centerline of the nearest track.
- k. All utilities must be a minimum of 15 ft. horizontally away from any existing or planned CN signals and facilities, when practicable.

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

- I. The zone of influence is as follows: Starting 15 feet from the centerline of nearest track at the base of rail, measured perpendicular to the track centerline, calculate a slope to the bottom of the proposed pipe at a 2H:1V slope. (See Section A-6)
 - i. If a 2H: 1V slope cannot be maintained or more restrictive conditions occur, approved shoring will be required. (See Section A-7)
 - ii. If shoring is required as stated above, a shoring plan designed to withstand E-80 loading shall be created, **stamped by a Professional Engineer**, and submitted to CN.
 - iii. If the excavation is outside the zone of influence, then the excavation shall follow OSHA requirements.
- m. A dewatering plan shall be created, **stamped by a Professional Engineer**, and submitted to CN as required by the CN Chief Engineer or the designated representative.
- n. Dry Horizontal Directional Drilling (HDD) is only allowed.
 - i. Mud slurry directional bore will be allowed only with the use of vents.
 - ii. No wet directional drilling is allowed.
- o. Vibrations Requirements
 - i. If there are fiber optic cables buried within the ROW, the Contractor shall submit details on the type of equipment to be used for pile driving and estimate the vibrations that will be induced at ground level during operation.
 - ii. The Contractor may be required to monitor vibrations levels during pile driving operations, for which the Contractor shall submit a procedure and the type of monitoring equipment to be used.
 - Induced vibrations shall be limited to a maximum peak particle velocity (PPV) of less than 3.5"/sec (measured in 3 mutually perpendicular directions taken at tie level / ground surface). And induced amplitude of movement shall be less than 1/128"
 - Vibrations undertaken within 150 ft. of fiber optic cables, induced vibrations shall be limited to a maximum of PPV of less than 1.5"/sec
- p. During construction, the Applicant shall maintain positive drainage of Railroad property. After construction is completed, the Railroad's right-of-way shall be restored to its original condition and to the satisfaction of the Railroad. Any fencing removed to facilitate construction shall be restored.
- q. Additional Resources for Underground Utilities:

<http://www.undergroundfocus.com/onecalldir.php> Provides links and information on state calls for cable locates
<http://www.ntdpc.com/> National Telecommunications Damage Prevention Council
<http://www.commongroundalliance.com> Common Ground Alliance

2. Underground Utility Crossing Requirements

- a. Utilities shall be located, where practicable, to cross tracks at approximately right angles but must not cross at an angle less than 45 degrees.
 - i. Any utility crossing that is less than 45 degrees will be considered a longitudinal utility and may be subject to higher requirements as required by the CN Chief Engineer or the designated representative.

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

- b. For all utility crossings the utility must be protected by a casing for the full width of CN's right-of-way or 50 ft. whichever is greater.
 - i. All casing pipes shall be sloped not less than 0.3%.
 - ii. Pipelines carrying commodities in a gaseous state are not required to have a steel casing as long as the top of the utility is at least 10 ft. below base of rail.
 - iii. Fiber optic utilities do not need a steel casing if the depth is 15 ft. or greater below the base of rail.
- c. Directional boring will be allowed at the discretion of the Railroad.
 - i. If practicable, boring excavation must not exceed the outside diameter of the pipe.
 - Bore shall not be greater than 1" larger than the utility diameter. Any over-cut by the cutting head should be minimized to match the pipe being installed. Any overcut shall be no more than 2" larger than the installed pipeline. 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 then grouting or other methods will be employed as approved by CN.
- d. Minimum depth of burial below:
 - i. Dry jack and Bore
 - Main Tracks Base of Rail = 6 ft.
 - Industrial Tracks Base of Rail = 6 ft.
 - Road Surface = 5 ft.
 - Ditch Bottom = 5 ft.
 - ii. Uncased Utility
 - Main Tracks Base of Rail = 10 ft.
 - Industrial Tracks Base of Rail = 10 ft.
 - Road Surface = 6 ft.
 - Ditch Bottom = 6 ft.
 - iii. Directional Bore
 - Main Tracks Base of Rail = 15 ft.
 - Industrial Tracks Base of Rail = 15 ft.
 - Road Surface = 6 ft.
 - Ditch Bottom = 6 ft.
- e. Multiple Crossings – Refer to AREMA Standard 4.19.8 multiple installations. Each crossing should be permitted separately.
- f. Any excavation must not be located on CN right-of-way or within a minimum of 50 ft. from the centerline of track, whichever is greater.
- g. Warning, utility markers shall be installed at any intersection of any utility and CN right-of-way.
 - i. Marker should show accurate owner, contact, and CN Agreement Number.

3. Longitudinal Underground Utility Requirements

- a. Underground utilities laid longitudinally in railroad right-of-way shall be located as far as practicable from any tracks or other important structures.
- b. Longitudinal lines must be a minimum of 25 ft. from the center line of track, or outside the track embankment section, whichever is greater.

**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

- c. Uncased steel carrier pipe utilities laid longitudinally on the railroad right-of-way, 25 ft. to 50 ft. from the center line of the nearest rail shall be buried not less than 6 ft. from the natural ground surface to the top of pipe. If distance is more than 50 ft. from centerline of track, minimum cover shall be 5 ft.
 - i. At all locations on the right-of-way farther than 25 ft. away from the centerline of the nearest track, the minimum natural ground cover for uncased steel natural gas pipes must be 6 ft.
- d. Plastic carrier pipes are not allowed for longitudinal utilities on CN right-of-way.
- e. Longitudinal underground utilities must be marked by a sign approved by the CN Chief Engineer or the designated representative every 500 ft., at every road crossing, streambed, other utility crossing, and at locations of major change in direction of the line.
 - i. Marker should show accurate owner, contact, and CN Agreement Number.

(REMAINDER OF PAGE INTENTIONALLY LEFT BLANK)

**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

VI. Additional Requirements for Underground Utilities with Diameter of 10 Inches or Greater (Including Casing)

1. Drawings shall be **stamped, signed, and dated** by a Professional Engineer licensed in the State where the work is being performed. CN reserves the right to prohibit a certain construction methodology, at its own discretion; however, CN shall not assume any responsibility for the suitability of the accepted method. Open cut methodology shall only be considered where other installation techniques are deemed impractical and where rail traffic volumes are low. Installations using water jet methods shall not be permitted.
2. Complete Subsurface Investigation
 - a. Boreholes are required at each end of the crossing and at each entry/exit pit with a maximum spacing between boreholes of 150 ft.
 - b. The boreholes shall be drilled to a depth of 20 ft. below the proposed crossing depth or to 20 ft. below the maximum feasible crossing depth if the proposed crossing depth has not yet been determined.
 - c. Soils samples shall be obtained at 3 ft. intervals to a depth of 15 ft. and also within the proposed utility horizon (i.e., from at least 7 ft. or one pipe/casing diameter above the proposed utility invert to at least 7 ft. or one pipe/casing diameter below the proposed utility invert). At other depths, soil samples may be obtained at 5 ft. intervals; No boreholes will be completed between ties or tracks in double track territory.
 - d. If bedrock is encountered at the proposed location, the bedrock will be cored to establish the competency and engineering characteristics of the bedrock. The bedrock shall be cored to at least 5 ft. below the invert of the proposed crossing.
 - e. Soil classification testing (i.e., water content determination, Atterberg Limits testing and grain size distributions) shall be carried out on soil samples obtained from all major soil strata and on soil samples obtained from every layer that the proposed tunnel would intersect.
 - f. The stabilized groundwater elevation must be established by installation of piezometer/monitoring well(s); at least one piezometer/monitoring well must be maintained in operation and checked prior to construction to confirm the groundwater elevation.
3. Submit a **stamped** Geotechnical Report prepared by a Licensed Geotechnical Engineer with experience in trenchless technology. The Report shall include:
 - a. Comments and recommendations with respect to construction methodology
 - b. An estimate of the expected extent and magnitude of ground movement over time
 - c. Measures to be undertaken to preserve the safety of rail operations and the structural integrity of the track structure
 - d. A detailed proposal for ground surface and subsurface monitoring
 - e. Factual subsurface information with all field and laboratory test data
 - f. A description of the site and soil stratigraphy including results of soil classification testing
 - g. A plan of the proposed crossing with borehole/testing/installation locations
 - h. A summary of groundwater conditions encountered during the investigation including the observed groundwater levels within the boreholes and the presence of any perched water levels at the borehole locations
 - i. Anticipated settlements as well as an assessment of the anticipated settlement through configurations

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

- j. A detailed monitoring plan to monitor any ground surface and subsurface movements during construction shall be provided. The Review and Alert (work stoppage) levels shall be provided
 - k. Submit a contingency plan and notification procedure to be implemented in the event of excessive/unexpected settlement or heave, and unforeseen changes in subsurface conditions, i.e. cobbles and boulders, raveling /flowing ground
4. Submit a Detailed Work Plan
- a. Details of the proposed methodology - the installation operations, methods of maintaining and adjusting line and grade, drilled/bored diameter, drill hole stabilization procedures, temporary dewatering measures and any mitigation procedures if sinkholes/settlement above the pipe occurs or excessive movement of the settlement monitors is observed.
 - b. The design of the crossing - length, diameter and thickness of the casing, elevations of the crossing invert at both ends, excavation shoring details and methods of dealing with cobbles/boulders and obstructions.
 - c. Provide additional details for specific installation methodologies as follows:
 - i. Jack and Bore: size and location of the auger head relative to the casing, estimated jacking thrust required, method of monitoring casing elevation, thrust block design calculations, record keeping system to document casing advance and jacking pressures, bulk heading, and grouting procedures. Bore head should not extend more than 1" ahead of the casing.
 - ii. HDD: slurry pressure and mitigation measures for frac-out if applicable. Vents shall be installed on each side of the track(s) to prevent frac-outs.
 - iii. TBM: type of machine, methods of primary ground support, grouting between the casing, ribs and lagging (primary support) and the surrounding soil/rock
5. Submit a Settlement Monitoring Plan including:
- a. Summary of Proposed Settlement Monitoring
 - i. Geographical Location
 - ii. Number of Settlement Monitoring Probes
 - iii. Type of Probe & installation Method
 - iv. Expected Amount of Settlement (in)
 - v. Frequency of Monitoring
 - vi. Duration of Monitoring
 - b. Site Plan:
 - i. Site Plan
 - ii. Identify Probe Locations and Offset Distances to Nearest Rails
 - iii. Elevation of Top-of-Probes
 - c. Probe Detail Drawing:
 - i. Show section through Railroad Track Roadbed
 - ii. Existing Ground Line
 - iii. Depth of Bore
 - iv. Distance to Bottom-of-Probe to Top of Casing Pipe
 - v. Submit a dewatering plan.

**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

6. Monitoring During Construction
 - a. Monitoring by a qualified geotechnical personnel and report to CN daily.
 - b. Installation in accordance with the Contractor's detailed work plan.
 - c. Over-excavation does not occur, and the liner / casing is installed tight to the excavation.
 - d. Report theoretical vs. actual volumes of spoils removed on per meter and total bases.
 - e. The excavation is fully supported until the liner / pipe installation is complete.
 - f. The bulkhead is installed at the end of every work shift or during any prolonged stoppage of work.
 - g. Voids are fully grouted to refusal immediately after the completion of liner / pipe installation. Report theoretical vs. actual volumes of grout pumped.

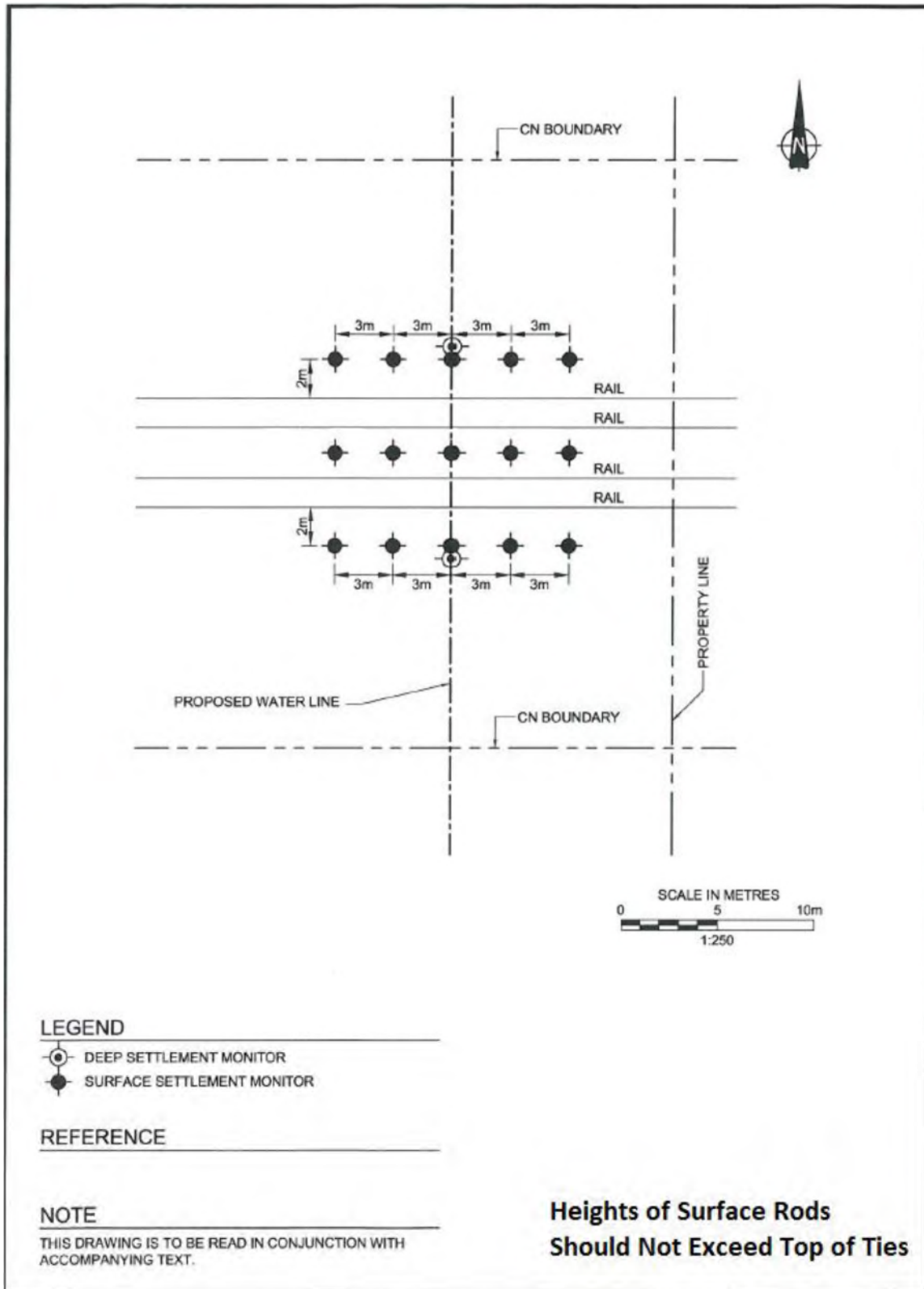
7. Reporting to CN during/post Construction
 - a. Progress of the contractor and pipe installation and what work was completed on that day,
 - b. A summary of the daily ground surface and subsurface movements showing a comparison to a baseline reading taken before the start of construction, settlements of greater than 3/8" shall be reported to CN immediately.
 - c. Any other geotechnical issues that may be of concern to CN.
 - d. Log of settlement survey results showing
 - i. Station
 - ii. Date and Elevation of Initial Readings
 - iii. Date and Elevation of Subsequent Readings
 - iv. Difference in Elevation
 - e. Submit ground surface and subsurface monitoring reports to CN daily, showing a comparison to baseline readings taken prior to the commencement of construction. Settlement of 3/16" is to be reported to CN immediately, and a settlement of 3/8" or greater the work is stopped until a resolution is achieved.

8. Provide, in writing, the name and phone number of the Applicant's qualified site inspector who will be on the job site on a full-time basis for the duration of construction. Update prior to work beginning if there are any changes.

**NO CONSTRUCTION OR ACCESS TO CN ROW WILL COMMENCE UNTIL AN AGREEMENT HAS BEEN
ENTERED INTO BETWEEN CN AND THE UTILITY OWNER**

APPLICATION FOR UTILITY OCCUPANCY REQUIREMENTS AND INSTRUCTIONS

A-1. Monitoring Points Requirements



**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

A-2. Minimum Wall Thickness for Steel Casing Pipe for E80 Loading

Table 1-5-1. Minimum Wall Thickness for Steel Casing Pipe for E80 Loading

Nominal Diameter (inches)	When coated or cathodically protected Nominal Thickness (inches)	When not coated or cathodically protected Nominal Thickness (inches)
12-3/4 and under	0.188	0.188
14	0.188	0.250
16	0.219	0.281
18	0.250	0.312
20 and 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 and 36	0.469	0.531
38	0.500	0.562
40	0.531	0.594
42	0.562	0.625
44 and 46	0.594	0.656
48	0.625	0.688
50	0.656	0.719
52	0.688	0.750
54	0.719	0.781
56 and 58	0.750	0.812
60	0.781	0.844
62	0.812	0.875
64	0.844	0.906
66 and 68	0.875	0.938
70	0.906	0.969
72	0.938	1.000

**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

A-3. Overhead Wireline Clearance Chart

FORMULA: .5" increase for every 1,000 volts in excess of 50 KV
 6" increase for every 12,000 volts in excess of 50 KV

Voltage (to ground)	Minimum Clearance Required above top Of rail	Minimum Clearance (Including Static Wires) Required above Communication and Signal Lines
0 to 750	27'0"	4'0"
8,700	28'0"	4'0"
15,000	28'0"	6'0"
50,000	30'0"	6'0"
74,000	31'0"	7'0"
98,000	32'0"	8'0"
122,000	33'0"	9'0"
146,000	34'0"	10'0"
170,000	35'0"	11'0"
194,000	36'0"	12'0"
218,000	37'0"	13'0"
242,000	38'0"	14'0"
266,000	39'0"	15'0"
290,000	40'0"	16'0"
<i>THESE CLEARANCES ARE TO INCLUDE ALL TRACKS OPERATED AS MAIN TRACKS, SIDINGS, AND OTHER AUXILIARY TRACKAGE.</i>		

APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS

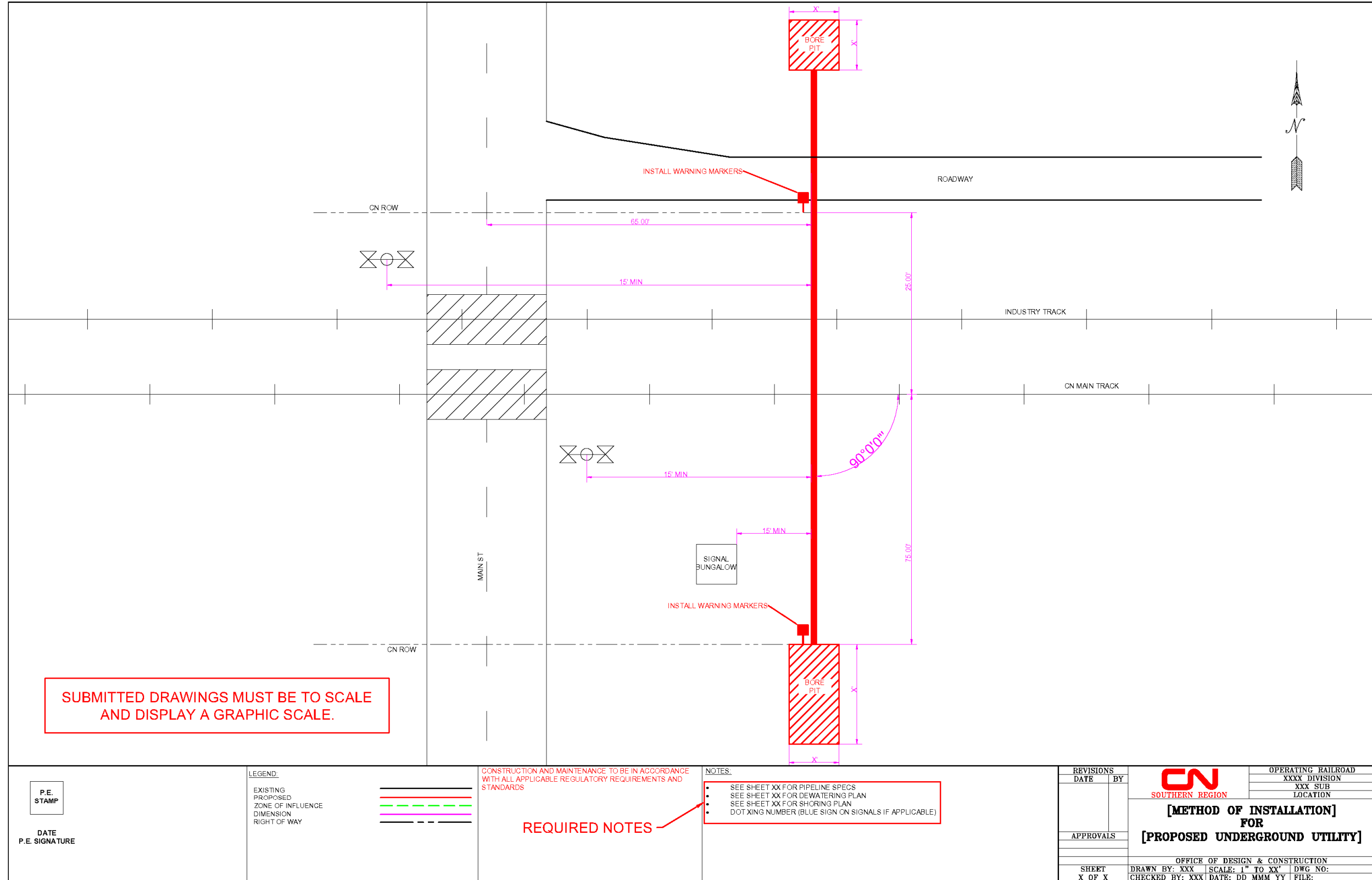
A-4. Marking of Utilities on Railroad Right-of-Way

CABLE ROUTE MUST BE MARKED AT EDGE OF RIGHT OF WAY WHERE CABLE ENTERS OR LEAVES RAILROAD PROPERTY. IN CASES OF PARALLEL CABLE ROUTE, SIGNS AS INDICATED IN FIGURE 1 ON THIS EXHIBIT WILL BE PLACED APPROXIMATELY EVERY 200 FEET. SIGNS TO BE OF A PERMANENT VERTICAL TYPE, NOT SMALLER THAN 5 INCHES WIDE BY 12 INCHES HEIGHT. YELLOW BACKGROUND WITH BOLD BLACK LETTERING. SIGNS TO BE MOUNTED ON METAL POSTS OR AS OTHERWISE AGREED TO AT A HEIGHT OF 3 FEET ABOVE GROUND LEVEL.



APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS

A-5. Example Plan View

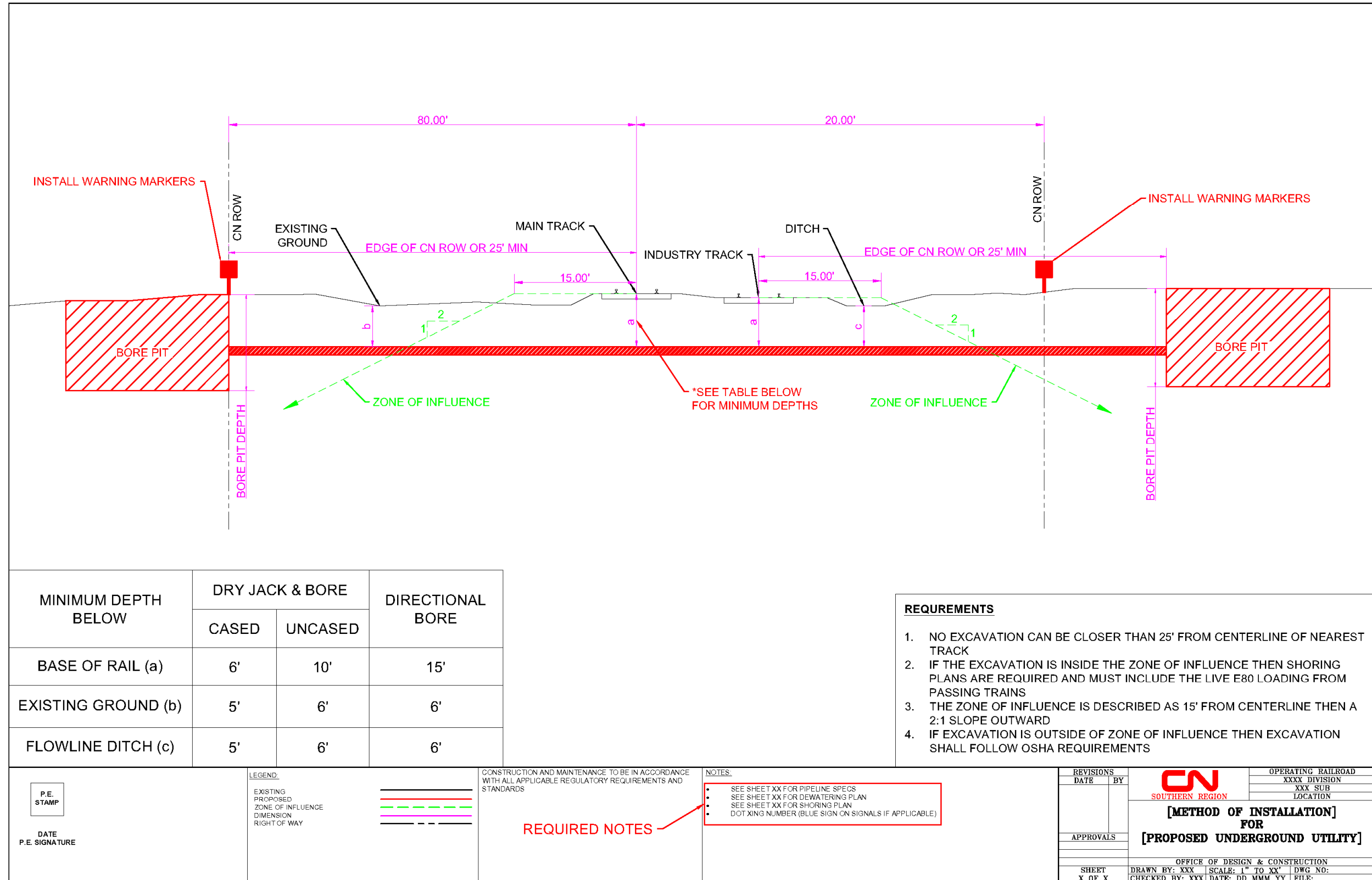


SUBMITTED DRAWINGS MUST BE TO SCALE AND DISPLAY A GRAPHIC SCALE.

<p>P.E. STAMP</p> <p>DATE</p> <p>P.E. SIGNATURE</p>	<p>LEGEND:</p> <p>EXISTING</p> <p>PROPOSED</p> <p>ZONE OF INFLUENCE</p> <p>DIMENSION</p> <p>RIGHT OF WAY</p>	<p>CONSTRUCTION AND MAINTENANCE TO BE IN ACCORDANCE WITH ALL APPLICABLE REGULATORY REQUIREMENTS AND STANDARDS</p>	<p>NOTES:</p> <ul style="list-style-type: none"> SEE SHEET XX FOR PIPELINE SPECS SEE SHEET XX FOR DEWATERING PLAN SEE SHEET XX FOR SHORING PLAN DOT XING NUMBER (BLUE SIGN ON SIGNALS IF APPLICABLE) 	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	DATE	BY			<p>OPERATING RAILROAD</p> <p>XXXX DIVISION</p> <p>XXX SUB</p> <p>LOCATION</p>
				DATE	BY				
<p>APPROVALS</p>	<p>CN</p> <p>SOUTHERN REGION</p> <p>[METHOD OF INSTALLATION]</p> <p>FOR</p> <p>[PROPOSED UNDERGROUND UTILITY]</p>								
<p>OFFICE OF DESIGN & CONSTRUCTION</p>		<p>REQUIRED NOTES</p>		<p>SHEET</p> <p>X OF X</p>	<p>DRAWN BY: XXX</p> <p>CHECKED BY: XXX</p>	<p>SCALE: 1" TO XX'</p> <p>DATE: DD MMM YY</p>	<p>DWG NO:</p> <p>FILE:</p>		

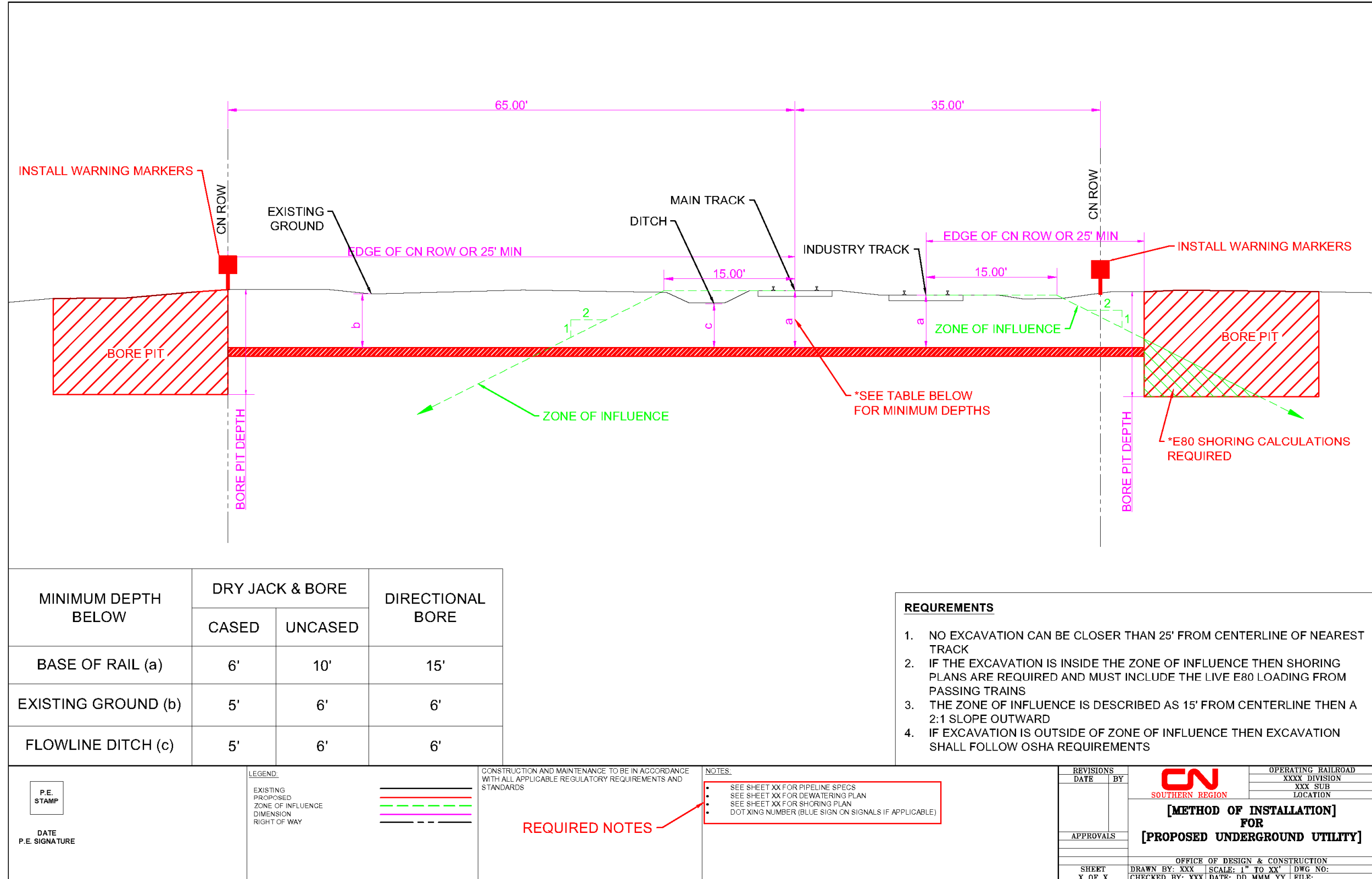
**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

A-6. Example Profile 1



**APPLICATION FOR UTILITY OCCUPANCY
REQUIREMENTS AND INSTRUCTIONS**

A-7. Example Profile 2 – Requires Shoring



MINIMUM DEPTH BELOW	DRY JACK & BORE		DIRECTIONAL BORE
	CASED	UNCASED	
BASE OF RAIL (a)	6'	10'	15'
EXISTING GROUND (b)	5'	6'	6'
FLOWLINE DITCH (c)	5'	6'	6'

REQUIREMENTS

1. NO EXCAVATION CAN BE CLOSER THAN 25' FROM CENTERLINE OF NEAREST TRACK
2. IF THE EXCAVATION IS INSIDE THE ZONE OF INFLUENCE THEN SHORING PLANS ARE REQUIRED AND MUST INCLUDE THE LIVE E80 LOADING FROM PASSING TRAINS
3. THE ZONE OF INFLUENCE IS DESCRIBED AS 15' FROM CENTERLINE THEN A 2:1 SLOPE OUTWARD
4. IF EXCAVATION IS OUTSIDE OF ZONE OF INFLUENCE THEN EXCAVATION SHALL FOLLOW OSHA REQUIREMENTS

<p>P.E. STAMP</p> <p>DATE</p> <p>P.E. SIGNATURE</p>	<p>LEGEND:</p> <p>EXISTING</p> <p>PROPOSED</p> <p>ZONE OF INFLUENCE</p> <p>DIMENSION</p> <p>RIGHT OF WAY</p>	<p>CONSTRUCTION AND MAINTENANCE TO BE IN ACCORDANCE WITH ALL APPLICABLE REGULATORY REQUIREMENTS AND STANDARDS</p>	<p>NOTES:</p> <ul style="list-style-type: none"> • SEE SHEET XX FOR PIPELINE SPECS • SEE SHEET XX FOR DEWATERING PLAN • SEE SHEET XX FOR SHORING PLAN • DOT XING NUMBER (BLUE SIGN ON SIGNALS IF APPLICABLE) 	<p>REVISIONS</p> <table border="1"> <tr> <th>DATE</th> <th>BY</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	DATE	BY			<p align="center">CN</p> <p align="center">SOUTHERN REGION</p> <p align="center">[METHOD OF INSTALLATION] FOR [PROPOSED UNDERGROUND UTILITY]</p>	<p>OPERATING RAILROAD</p> <p>XXXX DIVISION</p> <p>XXX SUB</p> <p>LOCATION</p>
				DATE	BY					
<p>APPROVALS</p>	<p>OFFICE OF DESIGN & CONSTRUCTION</p> <p>SHEET X OF X DRAWN BY: XXX SCALE: 1" TO XX' DWG NO:</p> <p>CHECKED BY: XXX DATE: DD MMM YY FILE:</p>									

APPLICATION FOR UTILITY OCCUPANCY

Complete this form and return it along with a non-refundable preparation fee of \$1350 made out to CN.

1. Owner/Sponsor's Information

Company's Legal Name: _____

Street: _____

City: _____ State: _____ Zip: _____

Contact Name and Title: _____

Phone Number: _____ Owner/Sponsor's Project #: _____

Email Address: _____

2. Consultant's Information

Company's Legal Name: _____

Street: _____

City: _____ State: _____ Zip: _____

Contact Name and Title: _____

Phone Number: _____ Consultant's Project #: _____

Email Address: _____

Other Emails to include on correspondence: _____

3. Location Information (Attach a Copy of a Sketch Showing Location)

Nearest Public Road Crossing Street Name: _____

Nearest Public Road Crossing DOT #: _____ (# on Blue Sign at Crossing, e.g. 123456L)

_____ County: _____ State: _____

Utility Location – Railroad Mile Post: _____ plus _____ ft.

(Start Railroad Mile Post [no decimal] plus the feet beyond the Mile Post)

Utility Location – Railroad Mile Post: _____ plus _____ ft.

(End Railroad Mile Post of Segment if longitudinal; if crossing please leave blank)

Please provide the coordinates for the point at which the utility will cross over or under the track(s).

If it is a longitudinal to the tracks, please provide start and end coordinates.

Latitude: _____ °, Longitude: _____ °

Latitude: _____ °, Longitude: _____ °

Name of Submitter

Signature

Telephone #

Date

**APPLICATION FOR UTILITY OCCUPANCY
WIRE/FIBER/CABLE CONSTRUCTION INFORMATION**

4. Type of Occupancy (check all that apply – minimum of three):

- | | |
|--|---|
| <input type="checkbox"/> Telephone | <input type="checkbox"/> Fiber Optic (# of Strands _____) |
| <input type="checkbox"/> Cable TV | <input type="checkbox"/> Copper Pair (# of Wires _____) |
| <input type="checkbox"/> Coaxial | <input type="checkbox"/> Electric |
| <input type="checkbox"/> Underground | <input type="checkbox"/> Crossing |
| <input type="checkbox"/> Overhead | <input type="checkbox"/> Longitudinal |
| <input type="checkbox"/> Other (please specify): _____ | |

5. Wire/Cable Data

- A. Number of Poles/Towers on Property
 Existing: Steel or Wood _____
 New: Steel or Wood _____
- B. Number of Guys/Anchors on Property _____
- C. Cross arm Overhang _____ ft.
- D. Maximum Voltage _____
- E. Number of Wires/Cables/Pairs/Strands (please specify # and type) _____
- F. Depth of Top of Wire/Cable/Casing below base of Rail or Top of Ground _____ ft.
- G. Clearance Over Railroad Company's Wires _____ ft.
- H. Clearance Over Railroad Company's Tracks _____ ft.
- I. Casing Length (Property Line to Property Line) _____ ft.
- J. Size & Kind of Pipe or Duct _____
- K. Method: How is Pipe or Duct to be installed under the track
(dry bore & jack, directional, tunnel, other – specify) _____
- L. Size and Type of Wire/Cable _____
- M. Insulated _____
- N. Bare/Open Wire _____
- O. Stranded _____
- P. Solid _____
- Q. Angle of Crossing _____ °
- R. Length of Span Crossing Tracks (unsupported length if above tracks) _____ ft.

6. Location References and Clearances of Facility (Encroachment)

- A. Width of Public Road (crossing track) _____ ft.
- B. Distance From Each Facility (Encroachment) to Center Line of Main Track _____ ft.
- C. Distance From Each Facility (Encroachment) to Center Line of any Adjacent Track _____ ft.
- D. Side Clearance from Railroad Company's Wire to Nearest Pole/Tower _____ ft.
- E. Distance and Direction from Bridge Abutment, Culvert, Switch, Road Crossing, etc. _____ ft.

Name of Submitter	Signature	Telephone #	Date
-------------------	-----------	-------------	------

**APPLICATION FOR UTILITY OCCUPANCY
PIPE/CONDUIT INFORMATION**

7. Type of Occupancy (check all that apply – minimum of three):

- | | |
|--|---|
| <input type="checkbox"/> Sewer (specify type): _____ | <input type="checkbox"/> Natural Gas |
| <input type="checkbox"/> Steam | <input type="checkbox"/> Petroleum Products |
| <input type="checkbox"/> Air | <input type="checkbox"/> Chemical (specify type): _____ |
| <input type="checkbox"/> Water (specify type): _____ | <input type="checkbox"/> Other (please specify): _____ |
| <input type="checkbox"/> Underground | <input type="checkbox"/> Crossing |
| <input type="checkbox"/> Overhead | <input type="checkbox"/> Longitudinal |

8. Pipe Data

	CARRIER PIPE	CASING PIPE
A. Inside Diameter:	_____	_____
B. Outside Diameter:	_____	_____
C. Wall Thickness:	_____	_____
D. Pipe Material:	_____	_____
E. Specification/Grade or class:	_____	_____
F. Min. Yield Point of Material	_____	_____
G. Process of Manufacture	_____	_____
H. Name of Manufacturer	_____	_____
I. Type of Joint	_____	_____
J. Working Pressure	_____	_____
K. Maximum operating pressure (by gauge)	_____	_____psi
L. Length of Casing pipe:	_____	_____ft.
M. Casing pipe/uncased carrier pipe cathodically protected?	Y / N	
N. Hydrostatic pressure carrier pipe test pressure	_____	_____psi
O. Will casing pipe be vented?	Y / N	
P. Pipe Vent Size:	_____	_____in.
Q. Will casing pipe/uncased carrier pipe have a protective coating?	Y / N	
R. Protective Coating Type	_____	
S. Depth of top of casing or uncased carrier pipe below base of rail or top of ground. _____ft. <i>(Closest point of utility to any base of rail or ground)</i>		
T. Method of installing casing pipe /uncased carrier pipe _____ <i>(Dry bore & jack, directional, tunnel, other – specify)</i>		
U. Depth of pipe below the ground. (not beneath tracks)	_____	_____ft.
V. Depth of pipe below ditches.	_____	_____ft.
W. Distance from centerline of track to face of jacking/receiving pits.	_____	_____ft.
X. Depth from base of rail to bottom of jacking /receiving pits.	_____	_____ft.

Name of Submitter

Signature

Telephone #

Date



INSURANCE REQUIREMENTS

1. By Licensee

Before commencing work, and until this Agreement shall be terminated or the FACILITY shall be removed (whichever date is later), the LICENSEE shall provide and maintain the following insurance in form and amount with companies satisfactory to and as approved by the RAILROAD.

- a. Statutory Workers Compensation and Employer's Liability insurance.
- b. Automobile Liability in an amount not less than \$1,000,000 dollars combined single limit.
- c. Comprehensive General Liability (Occurrence Form) in an amount not less than \$5,000,000 dollars combined single limit, with an aggregate of at least \$10,000,000 dollars. The Policy must name the appropriate RAILROAD as an Additional Insured and must not contain any exclusions related to:
 1. Doing business on, near, or adjacent to railroad facilities.
 2. Loss or damage resulting from surface, subsurface pollution contamination or seepage, or handling, treatment, disposal, or dumping of waste materials or substances.

Before commencing work, the LICENSEE shall deliver to the RAILROAD a certificate of insurance evidencing the foregoing coverage and upon request the LICENSEE shall deliver a certified, true and complete copy of the policy or policies. The policies shall provide for not less than ten (10) days prior written notice to the RAILROAD of cancellation of or any material change in, the policies; and shall contain the waiver of right of subrogation.

It is understood and agreed that the foregoing insurance coverage is not intended to, and shall not, relieve the LICENSEE from or serve to limit LICENSEE's liability under the indemnity provisions of any applicable agreement.

It is further understood and agreed that, so long as the Agreement shall remain in force or the FACILITY shall have been removed (whichever shall be later), the RAILROAD shall have the right, from time to time, to revise the amount or form of insurance coverage provided as circumstances or changing economic conditions may require. The RAILROAD shall give the LICENSEE written notice of any such requested change at least thirty (30) days prior to the date of expiration of the then existing policy or policies; and the LICENSEE agrees to, and shall, thereupon provide the RAILROAD with such revised policy or policies thereof.



INSURANCE REQUIREMENTS

2. By the Licensee's Contractor

If a contractor is to be employed by the Licensee for the installation of the FACILITY, then, before commencing work, the contractor shall provide and maintain the following insurance, in form and amount and with companies satisfactory to, and as approved by, the RAILROAD.

- d. Statutory Workers' Compensation and Employer's Liability insurance.
- e. Automobile Liability in an amount not less than \$1,000,000 dollars combined single limit.
- f. An Occurrence Form Railroad Protective Policy with limits of not less than \$5,000,000 dollars per occurrence for Bodily Injury Liability, Property Damage Liability and Physical Damage to Property with \$10,000,000 dollars aggregate for the term of the policy with respect of Bodily Injury Liability, Property Damage Liability and Physical Damage to Property. The policy must name the appropriate RAILROAD as the insured, and shall provide for not less than ten (10) days prior written notice to the RAILROAD'S as cancellation of, or any material change, in the policy.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS														
INSURED	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: center;">INSURER(S) AFFORDING COVERAGE</th> <th style="text-align: center;">NAIC #</th> </tr> <tr> <td>INSURER A :</td> <td></td> </tr> <tr> <td>INSURER B :</td> <td></td> </tr> <tr> <td>INSURER C :</td> <td></td> </tr> <tr> <td>INSURER D :</td> <td></td> </tr> <tr> <td>INSURER E :</td> <td></td> </tr> <tr> <td>INSURER F :</td> <td></td> </tr> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A :		INSURER B :		INSURER C :		INSURER D :		INSURER E :		INSURER F :	
INSURER(S) AFFORDING COVERAGE	NAIC #														
INSURER A :															
INSURER B :															
INSURER C :															
INSURER D :															
INSURER E :															
INSURER F :															

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER: 1

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADD L	SUB R	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
X	GENERAL LIABILITY COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR	Y	Y		EFF DATE	EXP DATE	EACH OCCURRENCE \$5,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$10,000,000 PRODUCTS - COMP/OP AGG \$
X	AUTOMOBILE LIABILITY ANY AUTO ALL OWNED S SCHEDULED AUTOS NON-OWNED AUTOS	Y	Y		EFF DATE	EXP DATE	COMBINED SINGLE \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
X	UMBRELLA LIAB EXCESS LIAB OCCUR CLAIMS-MADE	Y	Y		EFF DATE	EXP DATE	EACH OCCURRENCE \$5,000,000 AGGREGATE \$10,000,000
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y	Y		EFF DATE	EXP DATE	OTH-ER MIN STATUTORY

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Certificate holder is an additional insured under all polices on this certificate including Commercial General Liability and Umbrella Liability.

A Waiver of Subrogation applies in favor of the Certificate Holder for all policies on this certificate including Commercial General Liability and Umbrella Liability.

50 foot railroad exclusion is removed through CG 2417 10 01

CERTIFICATE HOLDER

CANCELLATION

(Appropriate Railroad Company Subsidiary for work location) Example: Wisconsin Central Ltd. and its Parents Attn: CN Flagging - US 17641 South Ashland Avenue Homewood, IL 60430	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE of
--	---

© 1988-2010 ACORD CORPORATION. All rights reserved.

ACORD 25 (2010/05)

The ACORD name and logo are registered marks of ACORD

CN Request for Flagging Services and Cable Location

Project Information:	
Please fill in each cell for processing	
Is this a new project?	
List CN Project # (Example SO# 123456, Network# R1234, PSC-132):	
Contractor's Right of Entry (ROE), License, or Permit #:	
Date of Agreement for ROE, License or Permit:	
Termination Date of Agreement for ROE, License or Permit (if applicable):	
Does the scope of work include underground, pile driving, excavation or other activities which would require a Railroad Cable Locate? Note: railroad cables and fibers are not part of any state utility locate programs. If a contractor shows up on site to perform work that requires a cable locate and it was not requested, the flagger will shut down the project	
Does your project require vehicular traffic to be shifted out of its intended lane against the current of traffic at a railroad grade crossing?	
Railroad Subsidiary (listed on your agreement):	
<p>Licensee and/or their contractor shall request, prepay, and secure Railroad Company signal facility locates by written notice to Railroad Company along with submission of CN's "Request for Flagging Services" form at least 10 business days in advance of proposed performance of any work or access to Railroad Company property. Dates requested are subject to Flagging's availability. Notice to Railroad Company does not fulfill or satisfy any other notification requirements for utility locates for non-railroad facilities.</p> <p><i>You must have an agreement with a CN railroad subsidiary, such as a Right of Entry, Permit, License or Formal Agreement in addition to any necessary flagging before you may enter CN property.</i></p>	
Flagging Protection Schedule:	
Requested Dates for Flagger Protection: Dates requested are subject to Flagging Co. availability and any project needing a cable locate will need 10 days minimum advance notice. This should be considered when requesting dates for flagging.	
Estimated Duration (in days) for Flagger:	
Estimated Work Schedule (example Mon. – Sat.)	
Daily Start Time / End Time (example 0700 to 1700 etc.): (Flagger start and end time may vary based on type of protection	
Flagging Protection Location:	
Railroad Mile Post (MP):	
Railroad Subdivision:	
Project's Location (Street location/intersection):	
Project - City / State:	
Project Description (example HDD, Jack and Bore, Encroachment, Underground or Overhead Pipeline / Wireline crossing, etc.):	
Location for flagger to report:	
Field Contact Person(s):	1st Alternate
Mobile Phone Number(s):	1st Alternate
Email Addresses:	

CN Request for Flagging Services and Cable Location

Billing Information:			
Company Name:			
Contact Name:			
E-Mail:			
Billing Address:			
City/State:			
ZIP Code:			
Company Phone:			
Electronic Payment Instructions		Payment Information	
Financial Institution	HARRIS TRUST AND SAVINGS BANK 311 WEST MONROE, CHICAGO, IL	Customer Number (if available)	
Account Name	Grand Trunk Western	CN Contact	
Account	274-733-5	Service Requested (Flagging MP, Request Date)	
US ROUTING (ABA)	071 000 288		
Remittance Details	nfcashmanagement@cn.ca	Prepayment Amount	
Please send payment remittance details and copy of this flagging request to nfcashmanagement@cn.ca			

Before Flagging Service is provided:
CN required online training must be completed before Flagging Protection will be scheduled.
Prepayment must be received before Flagging Protection will be scheduled.
There is an 8-hour minimum per day. The base rate for Flagging Protection is \$2,500 for 11 hours. Additional overtime hours must be prepaid at the rate of \$275.00 per hour. Weekends and Holidays must be prepaid at the overtime rate of \$3,025 / 11 hour minimum. (Rates Effective October 1, 2023.)
If additional days of flagging protection are required, they must be prepaid in advance.
Any prepayment not used can be refunded.
Railroad Cable Location must be prepaid, the cost is \$975.00 per locate.

This completed form must be sent with a map, confirmation of electronic prepayment, and proof of insurance to US_Flagging@cn.ca.

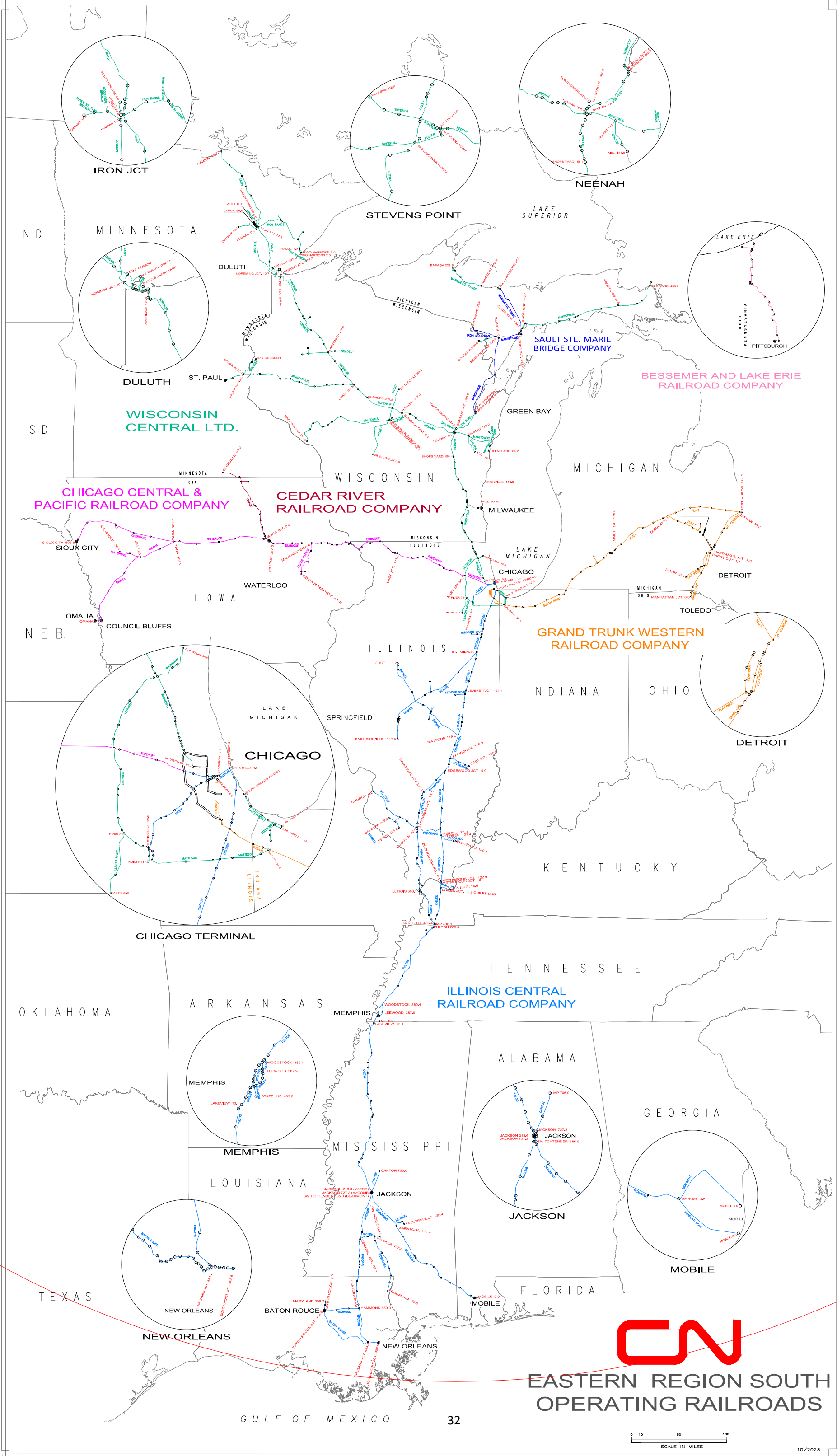
CN Flagging Department

US Flagging
T: 248-914-9695
17641 South Ashland Avenue
Homewood, IL 60430
US_Flagging@cn.ca

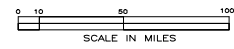
I, _____, agree to pay for flagging and/or cable locate services as requested _____.

Print Name

Signature



EASTERN REGION SOUTH OPERATING RAILROADS



APPENDIX B

2022 CONCRETE BOX CULVERT INSPECTION REPORT BY RUEKERT & MIELKE, INC.

**2022 CONCRETE BOX CULVERT
INSPECTION**

**CITY OF DE PERE
BROWN COUNTY, WISCONSIN
FEBRUARY 2023**

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
Table 1 – Executive Summary for Recommended Rehabilitation	1
INTRODUCTION.....	1
Figure 1 - De Pere Box Culvert Record Drawings Cross Sections	2
HISTORICAL INFORMATION	2
Table 2 – De Pere Box Culvert.....	2
PAST REPAIRS	3
Figure 2 – De Pere Box Culvert Repairs	3
Figure 3 – 48-inch diameter HDPE storm sewer at Station 15+30 (facing south).....	4
Figure 4 – 48-inch diameter HDPE storm sewer at Station 11+32 (facing north)	4
FIELD INVESTIGATIONS.....	5
Figure 5 – Dewatering operations at the outfall at Fox River on July 13, 2022.....	5
<u>In-Person Inspection:</u>	5
Figure 6 – Sounding concrete for voids with roofing hammer.	6
Figure 7 - Field investigations of the culverts on July 13, 2022.....	7
<u>Core Samples:</u>	7
Figure 8 – Core samples patched at Station 21+65. Image is from the televising video.	7
Figure 9 – Core Sample #2: Saw cut and lapped core profile with the outer surface to the left with macrocrack mapped in red ink. The concrete contained very few coarse aggregate particles and exhibited a very soft paste. (Photo 14 from Appendix B)	8
<u>Televising:</u>	9
Figure 10 – 48-inch diameter HDPE storm sewer buckling and fractures.....	9
FAILURES.....	10
Figure 11 – Isolated failure: hole into sanitary sewer encasement.	10
<u>Connection Culverts:</u>	11
Figure 12 - STA. 10+69, 30” concrete with failing connection in need of grouting.....	11
<u>Concrete Failure:</u>	11
Figure 13 - STA. 17+05 wall crack.	12
Figure 14 - STA. 22+30 ceiling failure with exposed rebar.....	12
REHABILITATION.....	13
<u>Alternatives:</u>	13
RECOMMENDED REHABILITATION	14
<u>Construction and Present Worth Costs:</u>	14
Table 3 – Year 1 / 2 (2023 / 2024) Recommended Rehabilitation Costs	14
Table 4 – Year 5 (2028) Recommended Rehabilitation Costs	15

Table 5 – Year 10 (2033) Recommended Rehabilitation Costs	15
<u>Impacts on Operations and Maintenance:</u>	15

APPENDIX

- Appendix A – Inspection Log Table
- Appendix B – Core Sample Report
- Appendix C – Televising Report and Video
- Appendix D – Photos

EXECUTIVE SUMMARY

This report encompasses observed deterioration and recommended repairs from an internal inspection of the City of De Pere Concrete Box Culvert, sewer televising reports, and structural analysis from borings. The purpose of the report is to evaluate and analyze recommended alternatives, while considering construction costs.

The goal of the report is to recommend feasible alternatives for the rehabilitation of the City of De Pere Concrete Box Culvert. Included in this report is an analysis of recommended rehabilitations for the culvert. In summary, it is recommended that a ten-year rehabilitation plan be followed to extend the lifespan of the culvert. The recommended rehabilitation plan would include 48-inch storm sewer repair, concrete paving, grouting of box culvert joints and cracks, culvert connection repairs, and geopolymer coating. The proposed improvements are intended to add 50 to 75-years to the lifespan of the culvert once completed. Table 1 below, is a summary of the ten-year recommended rehabilitation plan schedule and costs.

Table 1 – Executive Summary for Recommended Rehabilitation

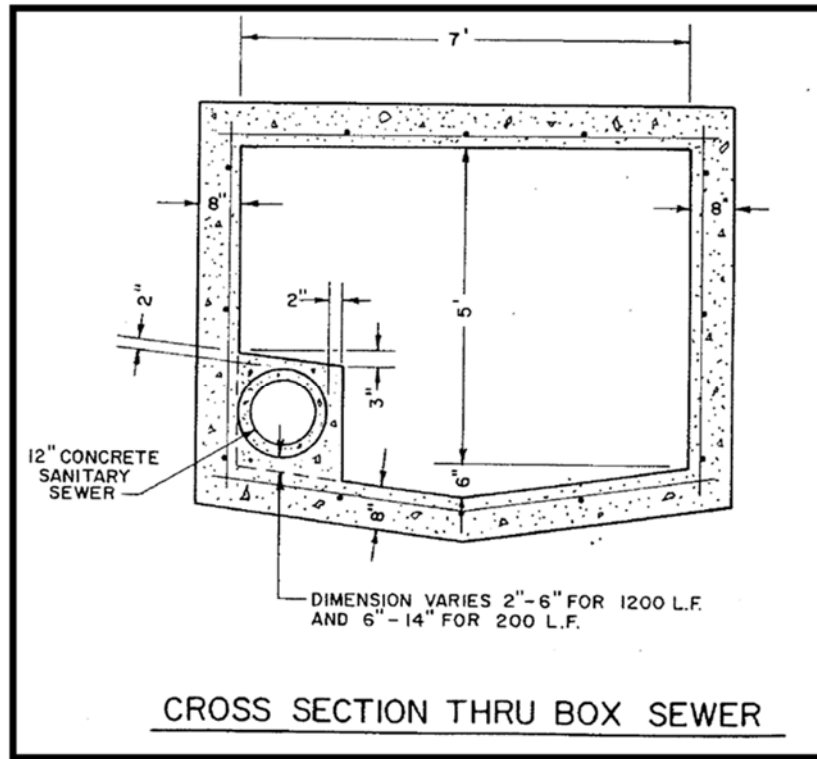
Recommended Rehabilitation Schedule		
Year 1 / 2 (2023 / 2024)	Year 5 (2028)	Year 10 (2033)
48-inch Storm Sewer Replacement	Grouting	Geopolymer Coating
Grouting of Box Culvert Joints and Cracks	Concrete Paving (as needed)	
Repair of Connections at Culvert	Repair of Connections at Culvert	
Repair of Roof Delamination	48-inch Storm Sewer Replacement	
\$256,584.00	\$233,190.00	\$1,083,750.00

INTRODUCTION

The City of De Pere owns and maintains an approximate 5-foot high, by 7-foot wide concrete box culvert 1,826 feet in length, that runs from Grant Street (CTH EE), just west of S. Sixth Street northward and eastward to the Fox River. The culvert conveys storm water from approximately 325 acres on the west side of De Pere. The 325 acres is primarily residential with pockets of institutional (West De Pere High School), park and industrial area uses. The outlet of the culvert is to the Fox River slough. The slough is connected to the Fox River which connects to Green Bay. At times of high water levels in the Bay or high winds, water surges will increase the water level in the Fox River which raises the elevation of standing water in the box culvert. When this condition occurs access to the box culvert outfall can only be made by creating a temporary dam at the outfall and pumping the culvert down. Additionally the variable water level adjacent to the outfall affects the concrete surface of the box culvert.

In April 2022, the City of De Pere contracted with Ruckert & Mielke, Inc. to review the condition of the box culvert and sanitary sewer located within the storm sewer. The purpose of the review was to determine any immediate repairs that may be needed to the culvert. Additionally, the review is intended to provide the City with a strategy for the long-term rehabilitation of the culvert.

Figure 1 - De Pere Box Culvert Record Drawings Cross Sections



HISTORICAL INFORMATION

The original design of the box culvert in 1937 was for construction of approximately 1,825 feet of box culvert from Grant Street (CTH EE) near S. Sixth Street (Station 10+00) to the outfall at Fox River (Station 28+25) including 50-foot portion of Bridge Structure at the railroad (Station 15+30 to 15+80). At some point 1,365 feet of 12-inch sanitary sewer was placed in the box culvert western/northern wall from Grant Street to (Station 10+10 to Station 23+75). The last inspection and repairs of the box culvert were in 1997 which resulted in the top and side wall of 380-feet of box culvert being lined with a 48-inch diameter HDPE storm sewer. The repair was approximately 135-feet south of Grant Street to near the Bridge Structure (Station 11+32 to 15+21). In the analysis and review of the project we reviewed several historical documents provided by the City. These included:

- 1997 bidding documents, specifications and plans dated January and February 1997, material submittals dated March 1997, and photos dated May 1997.
- 2022 Record Drawings with access manholes depicted.
- Original Box Culvert Design Plans (Approximate Year, 1937)

Table 2 – De Pere Box Culvert

Location	Size
Grant Street Manhole (STA. 10+00 to 11+32)	7'0" Span x 5'3" Rise Concrete Box Culvert
48" Diameter Storm Sewer (STA. 11+32 to 15+21)	48" HDPE/Type ADS Storm Sewer Pipe in bottom portion of box culvert
Railroad Bridge Structure (STA. 15+30 to 15+80)	8'0" Span x 6'0" Rise Railroad Bridge Structure
Fox River Outfall (STA. 15+80 to 28+25)	7'0" Span x 5'6" Rise Concrete Box Culvert

PAST REPAIRS

Past in-person inspections in 1996 located defects along the top and side walls of the box culvert. From the interior investigations of these defect locations, it was determined at that time that the top of the culverts and side wall was deteriorating and had begun to fail. The inspection and design of repairs was performed by Brander Construction Technology, Inc.. The locations of prior repairs to the culverts are shown in Figure 2. Repairs included the removal of the deteriorated concrete top and side wall of the box culvert and placement of a 48-inch diameter HDPE/ADS storm sewer embedded with granular material, concrete surface repair and crack repair.

Figure 2 – De Pere Box Culvert Repairs



Figure 3 – 48-inch diameter HDPE storm sewer at Station 15+30 (facing south)



Figure 4 – 48-inch diameter HDPE storm sewer at Station 11+32 (facing north)



FIELD INVESTIGATIONS

Three separate field investigations were conducted in July 2022. The first investigation was a full internal inspection of the culverts. This was done with a two-person team for redundancy of inspection and review of the interior areas. The full length of the culverts was inspected over a one-day time frame. The second field investigation crew took 4 core samples to determine the concrete strength, chloride content and remaining useful life. The third field investigation involved televising of the interior of the culvert and sanitary sewer. The field investigations all required coordination with the City to dewater the box culvert at the daylighted outfall of the Fox River due to high water levels.

Figure 5 – Dewatering operations at the outfall at Fox River on July 13, 2022.



In-Person Inspection:

An in-person inspection was performed July 13, 2022 by a group of two Ruekert and Mielke, Inc employees. Entry points used were manhole at Station 10+00 (Grant Street) for the south portion before the 48-inch diameter HDPE storm sewer and the manhole at Station 21+50 (Parking lot near 556 Main Ave) and the outfall at the Fox River for the north portion of the inspection of the culverts. The portion of 48-inch diameter HDPE storm sewer was inspected as part of the televising. As part of the internal inspection the following information was logged: water and silt depth every 100-ft; stations and conditions of storm sewer connections; station of bends; station of deflections and deformities. The internal inspection log tables for the box culvert can be found in Appendix A.

During the internal inspection sounding of the concrete with a hammer to determine points of failure was used in addition to visual inspections. The sounding of the concrete was used to determine delamination of the original surface and also of the prior repairs.

Figure 6 – Sounding concrete for voids with roofing hammer.



The internal inspection of the culverts noted that there were no significant deflections within the box culvert. While there were occasional areas that had minor deflections, those deflections were generally limited to a single portion of the box culvert. Additionally, all deflections were less than ½-inch and did not exhibit cracking of any significance. For this reason it is surmised that the deflections may have been due to the form workmanship in the original construction. Because these are extremely limited, random areas, it was determined that the box culvert is not in structural failure at any location.

To determine if there were voids underneath the box culvert, a sounding technique with a roofing hammer was used. The 22-ounce hammer consists of one side with a typical hammer head and the opposite side of a 3.5-inch-wide hatchet head. By tapping and dragging the hammer along the culvert walls a “hollow” sound can be heard in areas where voids exist underneath the culvert. Surface sounding the culvert is helpful to determine areas where voids may be or where failure is beginning. In general, it was determined that most of the area around the culverts had no voids. In areas where hollow spots were discovered they were mostly limited to prior repair areas. It appears the bond between the repair material and original concrete surface has failed.

Figure 7 - Field investigations of the culverts on July 13, 2022.



Core Samples:

Core samples were taken at 4 locations within the culverts and were performed by American Engineering Testing (AET). Reports provided by AET are shown in Appendix B. Two samples were taken at each location to test for compressive strength and perform a petrographic analysis. The results provided a general overall condition of the concrete. Below is a summary of the results concluded in the report.

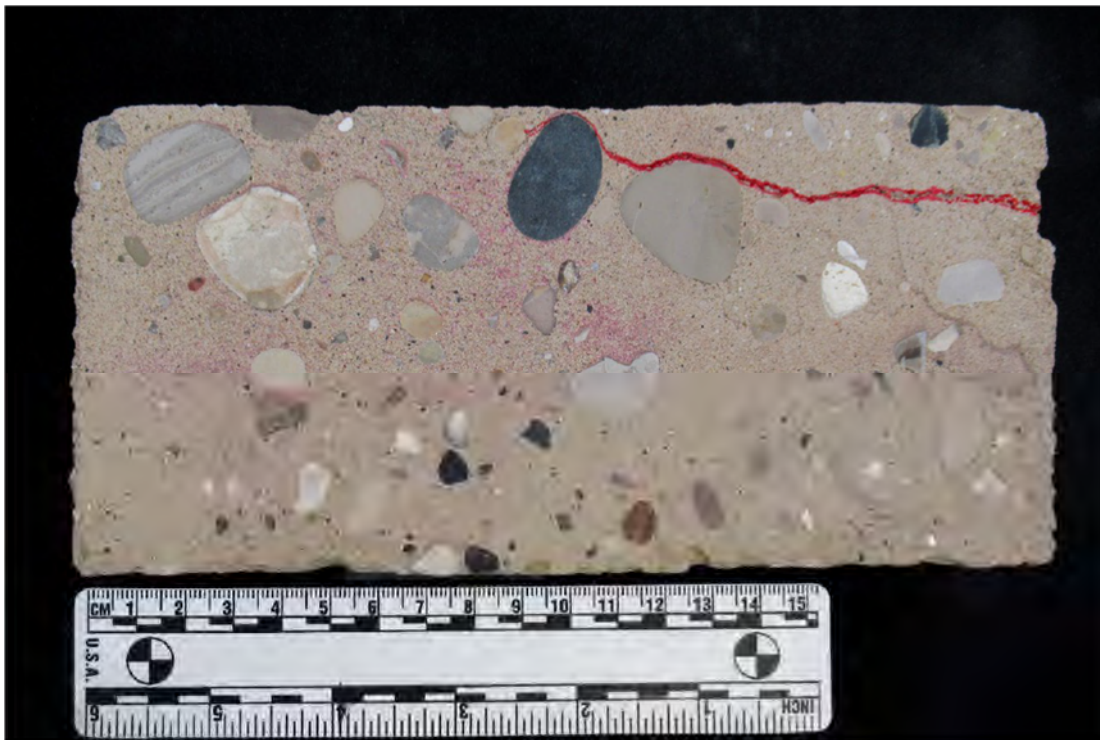
Figure 8 – Core samples patched at Station 21+65. Image is from the televising video.



The manhole located in the parking lot behind 556 Main Ave, De Pere, WI, at Station 21+50 was accessed for the core sample locations. Two core samples were taken at each location, core samples #1 (1A and 1B) at Station 21+65 (north of the manhole) and core samples #2 (2A and 2B) Station 21+12 (south of the manhole). Both locations of core samples were taken on the east wall near the top section. The overall condition for the core samples #1 was judged to be good, and did not exhibit any visual evidence of gross deterioration mechanisms, such as alkali-aggregate reactivity, freeze/thaw damage, or corrosion of embedded steel reinforcement. The core samples #2 overall condition was judged to be poor due to its placement with a very high-water content and a relatively low portion of coarse aggregate. The core samples #2 displayed a macrocrack from the inner surface to approximately 4-inch depth into the concrete, the cause was not entirely clear but can be concluded to be likely structural in origin.

The manhole near Grant Street at Station 10+00 was accessed, and two core samples were taken at Station 11+30. These core samples are labeled core samples #3 (3A and 3B). The location of this sample was chosen to provide a base condition of the proximity to the 1997 lining of the box culvert with the 48-inch diameter storm sewer. The sample was taken on the west side of the box culvert along the spring line of the 48-inch storm sewer. The tests judged the overall condition of the concrete sample to be good. The sample was free of fracturing/cracking and exhibited no visual evidence of any gross deterioration mechanisms.

Figure 9 – Core Sample #2: Saw cut and lapped core profile with the outer surface to the left with macrocrack mapped in red ink. The concrete contained very few coarse aggregate particles and exhibited a very soft paste. (Photo 14 from Appendix B)



The outfall at the Fox River was entered to access core samples #4 (4A and 4B). The core sample was taken at Station 28+00, 25 feet from the outfall of the box culvert. The sample was taken on the west side of the box culvert 1-foot up from the floor. The location was chosen to determine the integrity of the box culvert in a location that consistently is submerged. The core samples #4 was determined to be in fair to good condition overall. The test concluded that the inner surface of the core has mortar eroded and darkened, and the mortar erosion was consistent with exposure to an acidic solution or vapor. The loss of surface mortar was shallow, not indicating deeper issues within the concrete box walls.

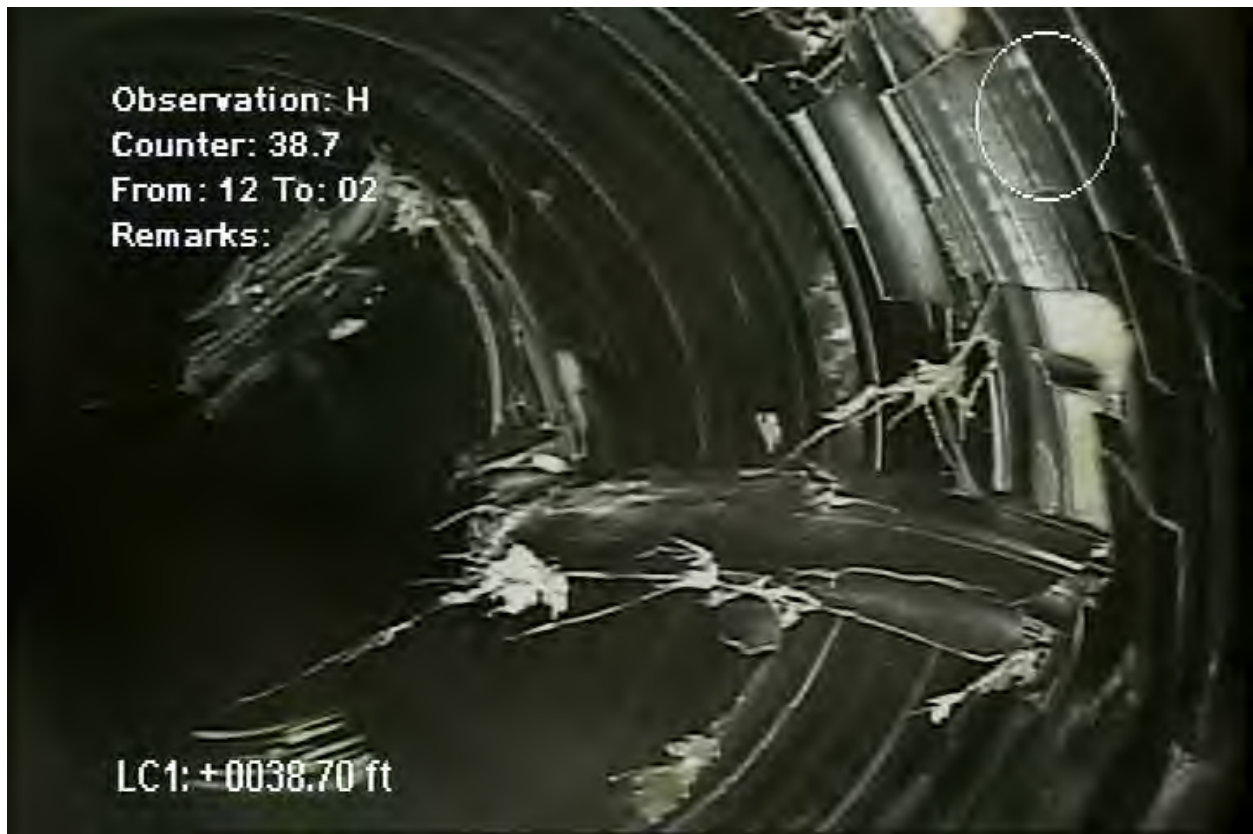
Televising:

Great Lakes TV Seal, Inc. completed a televising investigation of the storm sewer and sanitary sewer on July 15 and 18, 2022. The purpose of the televising was to record the condition of the storm sewer and sanitary sewer in the box culvert. The televising videos and report show connections and defects at locations and the Sanitary and Storm Sewer Inspection Report prepared by Great Lakes TV Seal, Inc. is shown in Appendix C.

To summarize the notable defects found in the Sanitary and Storm Sewer Inspection Report, prepared by Great Lakes TV Seal:

- Storm sewer defects were found from MH 45 S to MH 46S, within the 48-inch diameter storm sewer lining. Buckling, holes and multiple fractures are evident from the videos and photos. It is our recommendation that a 121 L.F. portion of the 48-inch diameter storm sewer be replaced that is in failure.
- Sanitary sewer was found to be in good condition requiring some maintenance and cleaning due to encrustations and deposits. There were areas of surface spalling of the sanitary sewer. Discussions with City staff indicate that there is a potential to relay the sanitary sewer elsewhere. It is recommended that the sanitary sewer be televised again in 2027. At that time a determination should be made to line the entire span of the 12-inch sanitary sewer. There are several sags in the line of 30-50 percent depth. If there are no noted operational issues in the next five years, the sanitary sewer may be lined.

Figure 10 – 48-inch diameter HDPE storm sewer buckling and fractures.



FAILURES

The attached table in Appendix A show the area of analysis by station for the culvert. During inspection an isolated failure within the sanitary sewer encasement was found (Station 21+26) with a 6-inch diameter hole into the 12-inch sanitary sewer. City staff were immediately alerted of this failure and completed repairs within the week to remedy future Fox River surges into the sanitary sewer system. However, the largest failure was the 48-inch HDPE/ADS diameter storm sewer system that was previously installed in 1997. Based upon inspections and design documents it appears the cause of failure of the 48-inch HDPE/ADS culvert is due to installation failure. Incorrect bedding, cover and backfill are the most common causes of HDPE/ADS pipe failure. The type of failure seen is typical for HDPE/ADS pipe installations in the 1990's. In general, the concrete box culvert was in good to fair condition, with concrete delamination, construction joints and connection culverts being the main sources of failure.

Figure 11 – Isolated failure: hole into sanitary sewer encasement.

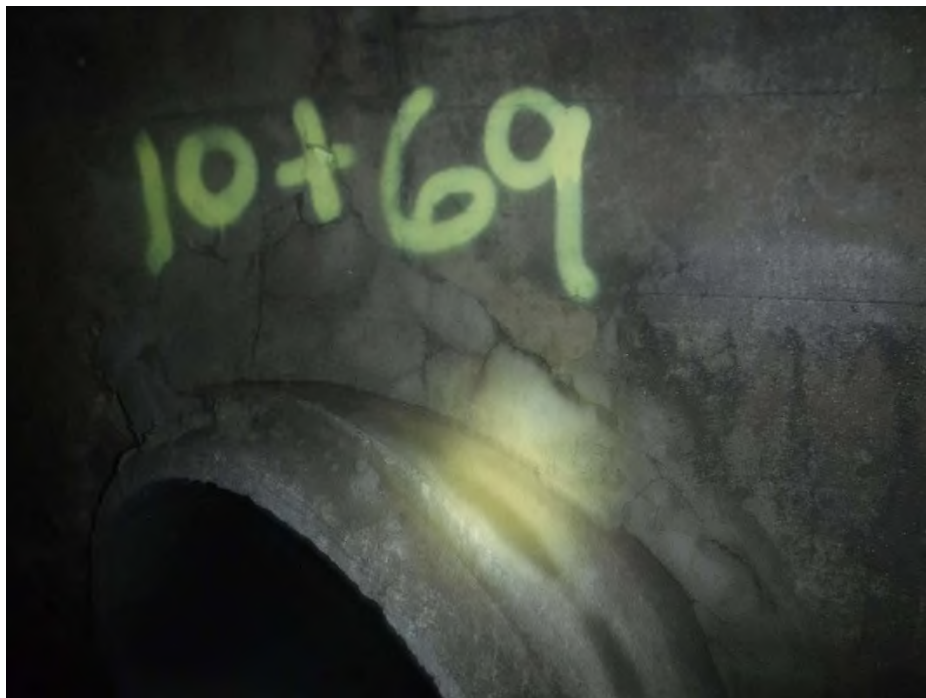


Connection Culverts:

There are multiple connections of the storm sewers to the box culverts where the connection points are failing. These failures could be caused by inadequate coating, chloride corrosion or other items. However, in the cases of failures at the culvert connections, repairs should be addressed. The City has ownership and responsibility for the repair at these points of connections to the culvert.

Appendix A includes a table for all the culvert connections. The table includes station location, size, condition, and estimated repair cost. Photos of most culvert connections are referenced in the tables and can be found in Appendix D or the televised records. The culvert connections highlighted in yellow are in need of repairs due to failures at the connection point to the main culvert. Estimated cost of repair for each connection varies and is shown in Appendix A. The repair cost is just at the connection point and does not include adjacent pipe repair costs by a third-party owner. A third-party owner could be the property owner.

Figure 12 - STA. 10+69, 30" concrete with failing connection in need of grouting.



Concrete Failure:

In general, the pipe is in good condition for areas generally in the waterline within the box culvert. However, with an age of 86-years, the box culvert is beginning to reach the end of its intended lifespan. The current concrete failures are exhibited by surface delamination, 1/8" to 3/4" cracks, and exposed rebar. The box culvert reinforcement is going to accelerate corrosion and deterioration if it is not addressed with repairs and rehabilitation. Along construction joints failure is evident with 1/8" to 3/4" cracks and infiltration. Irregular horizontal cracking (not along previous failures or construction joints) was minimal but will require maintenance and rehabilitation.

Figure 13 - STA. 17+05 wall crack.



Concrete delamination and failure is evident along the ceiling throughout the culvert and along the floor at the outfall. Areas in need of immediate repair are highlighted and outlined in Appendix A. Adjacent to previous ceiling failure is where the largest failures were discovered. Prior ceiling repairs were completed in 1997 and included steel ceiling patches and concrete patching of the ceiling. However, many of these prior repairs are failing and areas immediately adjacent to those areas as well. Experience tells us that delamination failure areas are often up to 50 percent larger than visually shown, and that adjacent areas should be repaired as well.

Figure 14 - STA. 22+30 ceiling failure with exposed rebar.



REHABILITATION

Alternatives:

There are several alternatives to the rehabilitation of the box culvert. These recommended alternatives were determined after an analysis of field investigations, evaluated data and conversations with the City. These include: 48-inch storm sewer repair/replacement, grouting to fill cracking and infiltration, concrete ceiling repairs, and internal geopolymer lining. The following narrative details each alternative. The City may determine, based on funding or other reasons, to eliminate or delay an alternative. This determination may then accelerate the implementation of a recommended alternative.

The delamination concrete failure along the ceiling and floor of the culverts is a particular concern. The delamination can range from ¼-inch concrete surface delamination to a depth of 2.5-inch and exposure of rebar. Once full perforation of the culvert occurs and the water levels rise and recede during storm events, the backfill material that is suspended above the bedding material will wash into the culverts. This will result in settlements in surface ground areas above the culverts and both property and asset damage. The correction of this problem could be addressed in a combination of the following:

- The 48-inch diameter storm sewer lining is in failure, and will need to be replaced within the next year. We recommend that the 121 L.F. section of 48-inch diameter storm sewer that is in failure be replaced in 2023. This is from Station 14+00 to Station 15+21. The remaining 48-inch storm sewer has multiple protruding taps and some sags, but no failures. We recommend this section (Station 14+00 to Station 11+77) be replaced by 2028. Care should be taken in the backfill and compaction of the storm sewer to prevent future failures. HDPE pipe can be used for the replaced pipe but bedding and cover are critical components.
- Inspect the box culvert every five years and conduct concrete paving and grouting of the culvert and connections as needed. It should be noted that this program would need to employ more of a destructive type of inspection rather than a simple visual observation.
- An annual program of grouting the construction joints and cracking in the culverts and repairing connection culverts, beginning in critical areas such as below buildings, roadways, parking lots and, lastly, landscaped areas.
- As the culvert ages, investigate the potential full rehabilitation of the culvert with a geopolymer structural coating application. Areas where this would first be considered would be the high-risk areas below buildings, roadways, parking lots and lastly landscaped areas. One of the significant costs of lining is dewatering. It would be most cost effective to line the section from Station 10+00 (Outfall) to Station 15+21 at one time.

Based on the core sample investigations as part of this report, it can be concluded that the soil chemistry and exterior forces of the culvert play a minor role in the overall deterioration of the culvert. From the core samples, only one of the samples exhibited significant loss of coating. It can be concluded that the concrete is not at this time in failure. However, surface delamination and spalling does exist, and will create accelerated interior corrosion. It will be a critical part of rehabilitation for the structural integrity of the culverts to address these failures in the next ten years.

It is recommended that the areas where concrete delamination failures were found that they be addressed soon but not later than 2024, with a long-term rehabilitation goal of using a geopolymer coating along the entire interior of the culvert sections.

RECOMMENDED REHABILITATION

It is recommended that a ten-year rehabilitation plan be put into place for the box culvert. The rehabilitation plan would include 48-inch diameter storm sewer repair/replacement, concrete paving, box culvert joint and crack grouting, culvert connection repairs, and geopolymer coating. The ten-year rehabilitation plan is shown in Tables 3, 4, and 5.

In the event that the City would like to accelerate the proposed ten-year rehabilitation plan, the concrete paving may be skipped. However, it is recommended that the joint and crack grouting and culvert connection repairs be completed prior to the geopolymer coating rehabilitation. The connection points at cross-culverts will be a continual item for repairs and should be repaired prior to being lined with the geopolymer coating.

Construction and Present Worth Costs:

In Year 1 or 2023, the areas of immediate concern shall be addressed with replacement of the 48-inch diameter storm sewer, concrete paving along the ceiling and floor, grouting at construction joints and cracks, and repair of culvert connections.

The 48-inch diameter storm sewer lining was found to be in need of immediate replacement. The 48-inch diameter storm sewer was inspected as part of the televising and can be found in the televising reports and video in Appendix C. The estimated overall cost of the 48-inch diameter storm sewer will be \$50,820.00 for a project that would be publicly bid. There would be a significant reduction in cost if the project were completed by force account.

From the table in Appendix A it is recommended that the delamination of the ceiling and floor in the box culvert be repaired and paved. It is estimated that the overall cost will be \$60,000.00.

The box culvert at many connection joints and where cracking is evident, on both the West and East culvert wall, shall be grouted. The estimated cost of repair is \$250.00 to \$1,000.00 at each grout connection. The repairs to the box culvert should be included in the 2023 / 2024 repairs to prevent water infiltration into the box culvert.

In addition, repairs to the connections to the culvert where the connection point is failing, should be addressed in Year 1 / 2. These failures are shown in the table in Appendix A and photos of the culvert connections are referenced in Appendix D. The 34 culvert connections in need of repairs due to failures at the connection point to the main culvert are estimated to cost \$85,000.00. This cost does not include third party pipe ownership repair or replacement costs.

Table 3 – Year 1 / 2 (2023 / 2024) Recommended Rehabilitation Costs

Year 1 / 2 (2023 / 2024)					
Repair	Year	Unit	Quantity	Unit Price	Cost
48-inch Diameter Storm Sewer	2023	LF	121	\$ 420.00	\$ 50,820.00
Concrete Paving	2024	LF	90	\$ 600.00	\$ 54,000.00
Grouting Construction Joint and Cracks	2024	EA	40	\$ 600.00	\$ 24,000.00
Repair of Connections at Culvert	2023	EA	10	\$ 2,500.00	\$ 25,000.00
Repair of Roof Delamination or Connections at Culverts	2024	EA	24	\$ 2,500.00	\$ 60,000.00
Subtotal (2023)					\$ 75,820.00
Subtotal (2024)					\$ 138,000.00
20% Administration, Legal and Engineering Contingency					\$ 42,764.00
Total					\$ 256,584.00

To continue to address rehabilitation of the box culvert and 48-inch diameter storm sewer, we recommend that the culvert continue to be inspected and grouted at connection joints and cracks, and delamination of the concrete be repaired and paved as needed, and the remainder of the 48-inch diameter storm sewer be replaced in the beginning of Year 5 or 2028. It is estimated that the overall cost of repairs in 2028 will be \$233,190.00.

Table 4 – Year 5 (2028) Recommended Rehabilitation Costs

Year 5 (2028)				
Repair	Unit	Quantity	Unit Price	Cost
Grouting Construction Joints and Cracks	EA	20	\$ 700.00	\$ 14,000.00
Repair of Connections at Culvert	EA	6	\$ 2,800.00	\$ 16,800.00
Concrete Paving (Estimated)	LF	60	\$ 675.00	\$ 40,500.00
Replace 48-inch Storm Sewer	LF	259	\$ 475.00	\$ 123,025.00
Subtotal				\$ 194,325.00
20% Administration, Legal and Engineering Contingency				\$ 38,865.00
Total				\$ 233,190.00

Rehabilitation of the interior coating of the culverts will require a geopolymer coating along the entire interior of the culvert to further extend the lifespan of the culvert. It is recommended that the geopolymer coating begin in Year 10 or 2033, and if warranted, extend for the next few years to be completed in phases, based on the areas in the highest risk (below buildings, roadways, parking lots, and lastly parks). It is estimated that the overall cost of the geopolymer coating will be \$1,083,750.00. The estimated costs for the geopolymer coating are inclusive of sediment removal.

Table 5 – Year 10 (2033) Recommended Rehabilitation Costs

Year 10 (2033)				
Repair	Unit	Quantity	Unit Price	Cost
Geopolymer Coating	LF	1,445	\$ 625.00	\$ 903,125.00
Subtotal				\$ 903,125.00
20% Administration, Legal and Engineering Contingency				\$ 180,625.00
Total				\$ 1,083,750.00

Given the costs of the 2028 maintenance we recommend reviewing geopolymer lining costs in 2027. Application techniques may allow for a lower cost prior to expending funds in 2028 and by accelerating the 2033 schedule to 2028.

Impacts on Operations and Maintenance:

It is recommended that a similar inspection approach be conducted (as detailed in this report) every five years, until the geopolymer lining is installed, after which time the operation and maintenance shall be re-evaluated. The internal inspection shall include, visual inspection (logging sediment depths, water depths, condition of connection culverts, condition of main culverts, and interior delamination loss), destructive type of inspection (scraping parallel and perpendicular to the concrete walls with a steel shovel and sounding the plates with a hammer), televising of the sanitary sewer and storm sewer, and monitoring the interior for deflections. Interior core samples and testing shall be conducted on an as-needed basis.

It is recommended that the City consider including reconstruction of each access point during rehabilitations. This will allow the contractor to work through a 48-inch opening (interwall access shaft dimension) instead of a 24-inch manhole lid opening. This will expedite debris removal, dewatering activities, and rehabilitation activities.

APPENDIX A – INSPECTION LOG

De Pere Box Culvert												
Item	Station Location	Orientation (facing upstream)	Connection			Silt Depth (inches)	Box Culvert Width (feet)	Box Culvert Height (feet)	Photo Number	Cost	Construction Year	Other
			Condition	Size (inches)	Material							
Access Shaft 24" MH	10+00		Poor					1	\$ 6,000.00	2028	24" diameter manhole is in poor condition and built of bricks. Rebuild Manhole	
Construction Joint: Start	10+08		Good					2				
Construction Joint: End	10+09		Good					2				
Storm Connection	10+10		Active	8	Clay			3				
Sanitary Sewer	10+11		Good	12	DI			4			CL 250 Sanitary Sewer on the East Wall	
Sanitary Sewer	10+13		Good					5			12" Sanitary Sewer W. Wall (Ductile Iron)	
Manhole	10+25		Good					6			Sealed manhole in ceiling.	
Construction Joint Grout Repair	10+30		Poor					7	\$ 250.00	2024	Construction joint with 1/2" crack - recommend grouting.	
	10+50											
Storm Inlet	10+55		Good	6			6	7	5.25		Storm inlet in ceiling	
Storm Connection	10+69	E	Poor	30	Concrete			9 & 10	\$ 250.00	2023	Pipe in good condition. Connection needs to be re-grouted around pipe.	
Storm Connection	10+90	E	Poor	6	DI			11	\$ 250.00	2023	Repair area around connection.	
Grout Repair	11+00						6	10	5.25			
Delamination	11+28											
BEGIN 48" Diameter HDPE/ADS	11+32						0					
	11+77		Poor				0	48" Diameter		\$475.00/LF	2028	Multiple taps protruding into pipe (See Great Lakes TV Report)
	12+00		Poor				0	48" Diameter		\$475.00/LF	2028	Multiple taps protruding into pipe (See Great Lakes TV Report)
	12+50		Poor				0	48" Diameter		\$475.00/LF	2028	Multiple taps protruding into pipe (See Great Lakes TV Report)
	13+00		Poor				0	48" Diameter		\$475.00/LF	2028	Multiple taps protruding into pipe (See Great Lakes TV Report)
	13+50		Poor				0	48" Diameter		\$475.00/LF	2028	Multiple taps protruding into pipe (See Great Lakes TV Report)
	14+00		Failure				0	48" Diameter		\$420.00/LF	2023	MH 45S - See Great Lakes TV Report. Multiple failures.
	14+50		Failure				0	48" Diameter		\$420.00/LF	2023	Multiple failures (See Great Lakes TV Report)
	15+00		Failure				0	48" Diameter		\$420.00/LF	2023	Multiple failures (See Great Lakes TV Report)
END 48" Diameter HDPE/ADS	15+21						0	48" Diameter		\$420.00/LF	2023	Inside Diameter 3' 9". Multiple failures (See Great Lakes TV Report)
Old Arch Bridge Structure BEGIN	15+30						0				17, 18, 19, 20	
Grout Repair	15+50							8	6	\$ 1,000.00	2024	Fair to poor construction joint - recommend grout repair.
Old Arch Bridge Structure END	15+80										24	
BEND	16+02										25	
Grout Repair	16+02									\$ 600.00	2024	16+02 to 16+05 diagonal floor crack - recommend grout repair.
Storm Connection	16+10	E	Active / Good	18	Concrete							
	16+74									\$ 2,000.00	2028	Construction joint wall offset, 2" void behind East wall. Approximately 7' diameter CMP about 2.7' above top of culvert. 2.8' E. wall no infiltration.
	17+00						0	7	5.4			Fair condition
Grout Repair	17+05									\$ 600.00	2024	1/4 to 3/4 -inch vertical crack - irregular
Storm Connection	17+35	W		8	Clay						32	
Storm Connection	17+43	E		8	Clay CMP Chamber					\$ 15,000.00	2028	Eventually CMP in manhole chamber adjacent to box will fail. Consider dig up and removal.
Manhole	17+50						3	7	5.4		35	Sealed Manhole
Grout Repair	17+60									\$ 1,000.00	2024	Construction joint 1/2 to 3/4" crack with infiltration.
Connection	17+92		Good	4	PVC						37, 38	4" PVC from East side to west side in good condition.
Infiltration	17+94									\$ 1,000.00	2024	4" PVC crossing from E. connection to sanitary sewer - infiltration.
Delamination	17+97									\$ 1,000.00	2024	Wall repair on East side - delamination
	18+00						4	7	5.4			
Storm Connection	18+06	E	Active / Fair	8	CMP						41	50% full of debris
Horizontal crack BEGIN	18+10									\$ 1,000.00	2024	1/2" horizontal crack. 2' off east side severe spalling and infiltration.
Storm Connection	18+13	W	Active / Good	15	CI						42	
Storm Connection	18+14	E	Active / Poor	8	PVC					\$ 1,000.00	2024	Infiltration on external pipe
	18+19									\$ 1,000.00	2024	Construction joint and manhole E. Wall Failure.
	18+50											
Storm Connection	18+56	Ceiling	Fair	8	PVC						46	
Storm Connection	18+63	W	Poor	4	PVC					\$ 1,000.00	2024	4" PVC enters W. Sanitary - multiple ceiling patches with steel plates in failure on east wall.
Horizontal crack END	18+65									\$ 600.00	2024	1/2" horizontal crack. 2' off east side severe spalling and infiltration.
Storm Connection	18+70	E	Good	4	PVC						50	4" PVC enters E wall

De Pere Box Culvert												
Item	Station Location	Orientation (facing upstream)	Connection			Silt Depth (inches)	Box Culvert Width (feet)	Box Culvert Height (feet)	Photo Number	Cost	Construction Year	Other
			Condition	Size (inches)	Material							
Storm Connection	18+70	E	1/2 GPM / Good	6	clay			51				
Storm Connection	18+70	W	Plugged	8	clay							
	19+00					1.5	7	5.7				
Horizontal crack BEGIN	19+14	E	active / offset joints	6	clay					2024	1/4" crack 2' horizontal east side spalling	
Storm Connection	19+17	E	Plugged / Infiltration	8	Clay			52	\$ 600.00	2024	Grout.	
Storm Connection	19+21	E	Active / Good	12	PVC			54				
Storm Connection	19+35	E	Plugged / Infiltration	4	Clay			55				
Storm Connection	19+35	E	Active / Fair	8	Clay			56				
Horizontal crack END	19+35	W		8				53	\$ 600.00	2024	1/4" crack 2' horizontal east side spalling	
Ceiling Repaired	19+36		Fair					57			Steel plate repair in ceiling.	
Infiltration	19+50						7	5.7	\$ 1,000.00	2024	Construction joint. 1/4" E & W infiltration - Grout.	
Storm Connection	19+78	Ceiling	Plugged / Fair	6								
Storm Connection	19+82	E	Plugged / Fair	8	CI			59			possible foundation piling	
Infiltration	19+96							60, 61	\$ 1,000.00	2024	construction joint 3/4" opening 5 GPM infiltration W - Grout.	
Ceiling Delamination	20+00							62	\$ 1,000.00	2024	ceiling in poor condition - Repair	
Infiltration	20+12								\$ 600.00	2024	Construction joint infiltration - Grout	
	20+18							63			MH active - 5 GPM	
FAILURE	20+18	W		18				64	\$ 1,000.00	2024	5 GPM concrete offset joints wall failure (photo)	
Storm Connection	20+28		Plugged	8	Clay			65				
CEILING FAILURE START	20+45							66		2024	Repair	
									\$ 12,500.00	2024	Repair	
Storm Connection	20+58	W	Plugged	6	tile					2024	Repair	
CEILING FAILURE END	20+59						7	5.4	\$ 1,000.00	2024	joint infiltration 1/2 GPM E & W sides significant crack and ceiling failure. - Repair	
Storm Connection	20+63	Ceiling	Active / Fair	6	tile			70, 71				
Storm Connection	20+64	E	Plugged / Fair	6	tile			72				
Storm Connection	20+68	ceiling	Active / Fair	3	clay			73			discharging 1/2 GPM water every so often/ possible sump pump connection.	
Storm Connection	20+74	E	Fair	6	ABS						enters east wall	
Storm Connection	20+81	W	Active / Fair	4	clay			74			running 1/4 GPM	
Storm Connection	20+89	E	Active / Fair	6	clay						running 1 GPM	
FAILURE	21+00						7	6	\$ 2,500.00	2024	Construction joint failure at ceiling - rebar exposed.	
Storm Connection	21+14	E	Plugged / Good	8	clay			76				
Storm Connection	21+21	Ceiling	Good	6	CI							
Storm Connection	21+25	E	Active / Fair	6	Clay tile			77			running 1 GPM	
	21+26							78, 79, 80			Open sewer connection 6" diameter west side - REPAIRED 7/2022. 6" diameter ABS pipe connection to sanitary sewer	
Grout Repair	21+32							81, 82	\$ 700.00	2028	Construction joint 1/4" crack and ceiling delamination - Grout	
Storm Connection	21+46	E	Offset / Fair	6	clay			83				
Grout Repair	21+50					0	7	5.5	\$ 700.00	2028	Crack at east wall 1/8" - Grout	
Storm Connection	21+65	W		8	Pvc							
Storm Connection	21+70	E	Plugged / Poor	6	clay			84	\$ 700.00	2028	Grout / Mortar at connection point.	
Grout Repair	22+00						7	5.5	\$ 600.00	2024	crack west to east 1/8" running 1 GPM west side.	
Infiltration	22+26								\$ 2,500.00	2024	Infiltration east side ceiling delamination, rebar exposed, ceiling repair failure	
FAILURE	22+30							85	\$ 1,500.00	2024	Ceiling Failure.	
Infiltration	22+50						7	5.5	\$ 600.00		1/8" crack, infiltration east side	
Grout Repair	22+55								\$ 600.00	2024	1/8" circumference crack - delamination	
Storm Connection	22+65	E		6	clay							
Storm Connection	22+83	Top	Poor					86, 87			break in inlet East	
Storm Connection	22+91	E	Fair	6	CI			88				
Storm Connection	23+05						7	5.5	\$ 2,500.00	2024	Ceiling delamination, previous repair at failure	
FAILURE	23+25								\$ 2,500.00	2024	crack, delamination. 50% of previous repair spalling and failing.	
FAILURE	23+40								\$ 2,500.00	2024	Ceiling repair is in failure.	
	23+50					2	7	5.5				

De Pere Box Culvert												
Item	Station Location	Orientation (facing upstream)	Connection			Silt Depth (inches)	Box Culvert Width (feet)	Box Culvert Height (feet)	Photo Number	Cost	Construction Year	Other
			Condition	Size (inches)	Material							
Sewer Encasement ENDS	23+75											sewer encasement. 1/4" crack on west side.
FAILURE	23+78								\$ 1,000.00	2024		2" diagonal floor failure - bottom offset - Grout
	24+00				0	7	4.75					
Manhole	24+20											48" precast manhole in good condition
Storm Connection	24+26	W	Good	15	PVC			90				
Storm Connection	24+28	E	Plugged	27	clay			91				
BEND FAILURE	24+36							92, 93	\$ 2,500.00	2024		ceiling delamination - exposed rebar / pipe failing
	24+50				3	7	5					
	24+80											Construction joint in good condition
	25+00				0	7	4.75					
Ceiling Delamination	25+23								\$ 1,500.00	2024		Construction joint and ceiling delamination
FAILURE	25+50						7	5.25	\$ 1,500.00	2024		bottom joint failure
Ceiling Delamination	25+75								\$ 1,500.00	2024		areas adjacent to prior ceiling repair beginning to fail (spalling)
	26+00				0	7	5.25		\$ 1,500.00	2024		
Ceiling Delamination	26+20								\$ 1,500.00	2024		spalling and failure of prior ceiling repair - rebar exposed delamination 1/2" to 3/4" in floor
Ceiling Delamination	26+35								\$ 1,500.00	2024		ceiling delamination of prior repair
FAILURE	26+50						7	5.2	\$ 1,500.00	2024		construction joint failure at east and west at bottom
FAILURE	26+75								\$ 1,500.00	2024		ceiling failure at prior repair
BEND	26+88											
	27+00						7	5.4				
	27+30										94	New ceiling. Ceiling delamination at old ceiling joint
BEGIN BOTTOM DELAMINATION	27+35		3/8-inch Delamination						\$ 1,500.00	2024		Bottom delamination 1 - 2" at bottom joint until outfall - Surface spalling.
	27+50		3/8-inch Delamination		1	6.8	4.75		\$ 1,500.00	2024		Surface spalling due to submerged concrete.
	28+00		3/8-inch Delamination				5.6	4.75	\$ 1,500.00	2024		Surface spalling due to submerged concrete.
Construction joint	28+13		3/8-inch Delamination						\$ 1,500.00	2024	95	Construction joint. Surface spalling due to submerged concrete.
OUTFALL / END BOTTOM DELAMINATION	28+25		1/2-inch Delamination						\$ 2,500.00	2024	96	ceiling failure 2.5" deep - rebar exposed. Bottom delamination ends.

APPENDIX B – CORE SAMPLE REPORT



REPORT OF CHLORIDE ANALYSIS

Project:

City of De Pere Box Culvert Inspection
De Pere, Wisconsin

Reported To:

Ruekert Mielke
1400 Lombardi Ave., Suite 101S
Green Bay, WI 54304

AET Project No.: P-0014824

Attn: Colin Meisel

Date: August 2, 2022

INTRODUCTION

This report presents the results of laboratory work performed by our firm on four (4) concrete core samples submitted to us by Andy Walters, American Engineering Testing, Inc., on behalf of Colin Meisel of Ruekert Mielke on July 15, 2022. The scope of our work was limited to documenting the water-soluble chloride content of the cores at depths of 0-1, 1-2, and 2-3 inches from inner side in accordance with ASTM C1218.


TEST PROCEDURES

Laboratory testing was performed on July 28, 2022, and subsequent dates in accordance with ASTM C1218-20, "Standard Test Method for Water-Soluble Chloride in Mortar and Concrete." The core samples were cut at the designated depths, crushed, dried in an oven, and processed to pass a U.S.A. Standard Test Sieve No. 20. Results presented in Table 1 are reported on a dry weight 105 °C basis.

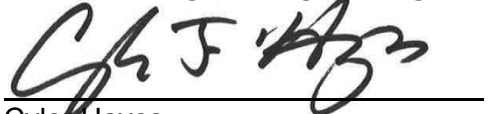
REMARKS

The test sample(s) will be retained for a period of at least sixty days from the date of this report. Unless further instructions are received by that time, the sample(s) may be discarded. The test results relate only to the sample(s) tested. No warranty, expressed or implied, is made.

Report Prepared by:
American Engineering Testing, Inc.


Kattie Reamer
Chemist I

Report Reviewed by:
American Engineering Testing, Inc.


Cylee Hayes
Senior Chemist / Chemistry Lab Manager
chayes@teamAET.com
Work: 651-603-6605



TEST RESULTS

Table 1 – Water-Soluble Chloride Content

<u>Sample Identification</u>	<u>Sample Depth¹, in.</u>	<u>By Mass of Sample</u>	
		<u>%</u>	<u>ppm (mg/kg)</u>
1A	0 - 1	0.011	110
	1 - 2	0.011	110
	2 - 3	0.009	90
2A	0 - 1	0.006	60
	1 - 2	0.005	50
	2 - 3	0.004	40
3A	0 - 1	0.012	120
	1 - 2	0.010	100
	2 - 3	0.012	120
4A	0 - 1	0.006	60
	1 - 2	0.019	190
	2 - 3	0.016	160

¹ Depths are from the inner side of each core.



REPORT OF PETROGRAPHIC ANALYSIS

Project:

City of De Pere Box Culvert Inspection
De Pere, Wisconsin

Reported To:

Ruekert Mielke
1400 Lombardi Ave., Suite 101S
Green Bay, WI 54304

AET Project No.: P-0014824**Attn:** Colin Meisel**Date:** August 10, 2022

INTRODUCTION

This report presents the results of laboratory work performed by our firm on four concrete core samples submitted by Andy Walters of American Engineering Testing on behalf of Colin Meisel of Ruekert Mielke on July 15, 2022. We understand the concrete cores were drilled horizontally from the walls of a box culvert at the above-referenced project location. The age of the concrete was unknown to us. The scope of our work was limited to performing petrographic analysis on the samples to document the general overall condition of the concrete.

CONCLUSIONS

Based on our observations and analysis:

1. The overall condition of concrete samples 1A and 3A was judged to be good. These cores were free of fracturing/cracking and exhibited no visual evidence of any gross deterioration mechanisms such as alkali-aggregate reactivity, freeze/thaw damage, aggressive chemical 'attack', or corrosion of embedded steel reinforcement.
2. The overall condition of concrete sample 2A was judged to be poor due to placement with a very high-water content and a relatively low portion of coarse aggregate. The core sample exhibited a macrocrack which proceeded from the inner surface to approximately 101 mm (4") depth into the concrete where it terminated at the cored edge of the sample. The cause of the crack was not entirely clear, but was likely structural in origin. The concrete was fully to partially carbonated through its thickness and exhibited a very soft (Mohs < 2) and porous paste. Further, the sample appeared to contain a relatively high portion of fine aggregate which was uniformly graded and of slightly different composition compared to fine aggregate in the other analyzed core samples.

550 Cleveland Avenue North | Saint Paul, MN 55114

Phone (651) 659-9001 | (800) 972-6364 | Fax (651) 659-1379 | teamAET.com | AA/EEO

This document shall not be reproduced, except in full, without written approval from American Engineering Testing, Inc.

3. The overall condition of concrete sample 4A was judged to be fair to good. The inner surface of the core was mortar eroded and darkened, with many exposed coarse aggregate particles which stood out in relief above the eroded paste. The mortar erosion was consistent with exposure to an acidic solution or vapor. The depth or loss of surface mortar was not determinable as no original inner surface was present. However, based on the length of the other analyzed core samples, the loss of surface mortar was likely shallow.
4. Visually, the concrete samples comprised a mixture of portland cement, natural carbonate-rich gravel coarse aggregate, and a natural sand fine aggregate. None of the concrete samples were air entrained. Embedded steel rebar was observed in all four core samples. The rebar was free of corrosion. In general, the concretes were well consolidated. Some minor honeycombing and paste-rich areas were observed within the outer approximately 25 mm (1") of core sample 1A.

SAMPLE IDENTIFICATION

Sample Type: Hardened Concrete Cores

<u>Sample ID</u>	<u>Diameter</u>	<u>Length</u>
1A	102 mm (4")	210 mm (8-1/4")
2A	102 mm (4")	210 mm (8-1/4")
3A	102 mm (4")	203 mm (8")
4A	102 mm (4")	210 mm (8-1/4")

TEST RESULTS

Our complete petrographic analysis documentation appears on the attached sheets entitled 24-LAB-001 "Petrographic Examination of Hardened Concrete, ASTM C856." A brief summary of the general physical characteristics of the concrete is as follows:

1. The coarse aggregate in the core samples was composed of 38 mm (1-1/2") nominal sized natural carbonate-rich gravel that appeared well graded and exhibited fair to good overall distribution in core samples 1A, 3A, and 4A. Core sample 2A contained very little coarse aggregate. The fine aggregate was a natural sand.
2. The paste color of the cores was similar to very pale orange (Munsell® 10YR 8/2) and mottled with medium gray (N5) in core sample 1A. The paste hardness was judged to be moderate (Mohs ~ 3) in core samples 1A, 3A, and 4A with the paste aggregate bond considered good. The paste hardness was judged to be very soft (Mohs < 2) in 2A with the paste aggregate bond considered poor.
3. The outer and inner surfaces of the cores were formed, with mortar erosion documented on the inner surface of 4A. The depth of carbonation ranged from 1 mm (1/32") to partially carbonated through the full length of core 2A.

4. The w/c of samples 1A, 3A and 4A was estimated to be between 0.40 and 0.55 with approximately 4 to 6% residual portland cement particles. The w/c of sample 2A was estimated to be more than 0.65 with approximately 2 to 4% residual portland cement particles. No supplementary cementitious materials were observed in any of the concrete samples.

AIR CONTENT TESTING

<u>Sample ID</u>	<u>Total Air Content (%)</u>	<u>"Entrained" Air (%) void <1 mm (0.040")</u>	<u>"Entrapped" Air (%) voids >1 mm (0.040")</u>	<u>Spacing Factor, in.</u>
1A	2.8	0.7	2.1	0.032
2A	5.3	4.3	1.0	0.008
3A	0.7	0.4	0.3	0.029
4A	1.3	1.1	0.2	0.011

TEST PROCEDURES

Laboratory testing was performed on July 18, 2022 and subsequent dates. Our procedures were as follows:

1.0 Petrographic Analysis

A petrographic analysis was performed in accordance with AET Standard Operating Procedure 24-LAB-001, "Petrographic Examination of Hardened Concrete," ASTM C856-latest revision. The petrographic analysis consisted of reviewing the cement paste and aggregate qualities on a whole basis on saw cut, lapped, and fractured sections. Reflected light microscopy was performed under an Olympus SZX-12 binocular stereozoom microscope at magnifications up to 160x. The depth of carbonation was documented using a phenolphthalein pH indicator solution applied on freshly saw cut and lapped surfaces of the concrete sample. The paste-coarse aggregate bond quality was determined by fracturing a sound section of the concrete in the laboratory with a rock hammer.

The water/cementitious of the concrete was estimated by viewing a thin section of the concrete under a Nikon E600 polarizing light microscope at magnifications of up to 600x. Thin section analysis was performed in accordance with Standard Operating Procedure 24-LAB-009, "Determining the Water/Cement of Portland Cement Concrete, AET Method." An additional, smaller, saw cut subdivision of the concrete sample is epoxy impregnated, highly polished, and then attached to a glass slide using an optically clear epoxy. Excess sample is saw cut from the glass and the thin slice remaining on the slide is lapped and polished until the concrete reaches 25 microns or less in thickness. Thin section analysis allows for the observation of portland cement morphology, including: phase identification, an estimate of the amount of residual material, and spatial relationships. Also, the presence and relative amounts of supplementary cementitious materials and pozzolans may be identified and estimated.

2.0 Air Content Testing

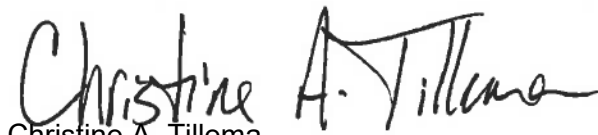
Air content testing was performed using Standard Operating Procedure 24-LAB-003, "Microscopical Determination of Air Void Content and Parameters of the Air Void System in Hardened Concrete, ASTM C457-latest revision." The linear traverse method was used. The concrete cores were saw cut parallel to the direction of coring and then lapped prior to testing.

REMARKS

The test sample will be retained for a period of at least sixty days from the date of this report. Unless further instructions are received by that time, the sample may be discarded. Test results relate only to the items tested. No warranty, expressed or implied, is made.

We appreciate the opportunity to have been of service to you on this project. If you have any questions regarding the information presented in this report or if we can be of additional assistance, please contact us.

Report Prepared By
American Engineering Testing, Inc.



Christine A. Tillema
Senior Petrographer
ctillema@teamAET.com
Work: 651-659-1353



Blake M. Lemcke, PG
Senior Petrographer/Geologist
MN License #50337
blemcke@teamAET.com
Work: 651-659-1362

24-LAB-001 PETROGRAPHIC EXAMINATION OF HARDENED CONCRETE, ASTM C856

Project No. P-0014824 **Date:** 8/1/2022 **Date reviewed:** 8/3/2022
Sample ID: 1A **Performed by:** B. Walter **Reviewed by:** B. Lemcke

I. GENERAL OBSERVATIONS

1. **Sample Dimensions:** Our analysis was performed on a 210 mm (8-1/4") x 102 mm (4") x 51 mm (2") thick lapped profile section and a 76 mm (3") x 52 mm (2") thin section that were saw-cut and prepared from the original 102 mm (4") diameter x 210 mm (8-1/4") long core.
2. **Surface Conditions:**
Outer: Smooth to rough, poorly consolidated and formed surface
Inner: Fairly smooth, formed surface, placed in formwork
3. **Reinforcement:** A 13 mm (1/2") diameter steel rebar was present at approximately 108 mm (4-1/4") depth from the outer surface. A 9 mm (3/8") diameter steel rebar was present at approximately 121 mm (4-3/4") from the outer surface. The two rebars were oriented sub-parallel to the outer/inner surfaces of the core and were oriented sub-perpendicular to each other. No corrosion observed.
4. **General Physical Conditions:** The formed outer surface of the core was poorly consolidated – exhibiting a few exposed coarse aggregates and irregular-shaped consolidation void spaces. The exposed voids measured up to 40 mm (1-9/16") in maximum dimension. The paste on the outer surface was soft to very soft (Mohs < 2 to 2.5) and was present to a maximum observed depth of 6 mm (1/4"). The outer 40 mm (1-9/16") of the concrete exhibited two oblong areas of coarse aggregate segregation or mortar/paste-rich areas and a few irregular-shaped consolidation voids. One small area of coarse aggregate segregation was present along the side of the core, ranging from approximately 13 mm (1/2") to 38 mm (1-1/2") depth from the outer surface. The area of coarse aggregate segregation contained few air voids and air voids that were finer than observed in the bulk of the sample. Colorless to white calcite was observed partly lining a few air voids within the carbonated paste near the inner surface. The concrete was not air-entrained. No visual evidence of bulk expansive alkali-aggregate reactivity was observed.

II. AGGREGATE

1. **Coarse:** 38 mm (1-1/2") nominal sized naturally occurring carbonate-rich gravel consisting of dolostone, partially silicified carbonate, greywacke, and basalt. The particles were mostly sub-rounded to rounded. The coarse aggregate appeared fairly graded and exhibited fair overall distribution.
2. **Fine:** Natural quartz, feldspar, carbonate, and lithic sand. The grains were mostly sub-rounded. The fine aggregate appeared well graded and exhibited good to fair overall uniform distribution.

III. CEMENTITIOUS PROPERTIES

1. Air Content: 2.8% total
2. Depth of carbonation: Ranged from 25 mm (1") up to 57 mm (2-1/4") depth from the outer surface. Ranged from 2 mm (1/16") up to 18 mm (11/16") depth from the inner surface.
3. Paste/aggregate bond: Good.
4. Paste color: Similar to very pale orange (Munsell® 10YR 8/2) mottled with medium gray (N5).
5. Paste hardness: Moderate (Mohs ≈ 3).
6. Microcracking: A few microcracks were observed within and proximal to a shale/siltstone coarse aggregate particle at approximately 101 mm (4") depth from the outer surface.
7. Secondary deposits: Colorless to white calcite was observed partly lining a few air voids within the carbonated paste near the outer surface. White acicular ettringite thinly lined a few air voids within the non-carbonated paste in the outer 73 mm (2-7/8") of the sample.
8. w/cm: Estimated at between 0.40 and 0.50 with approximately 4 to 6% residual portland cement particles
9. Cement hydration: Alites: Fully
Belites: Fully

24-LAB-001 PETROGRAPHIC EXAMINATION OF HARDENED CONCRETE, ASTM C856

Project No. P-0014824 **Date:** 8/1/2022 **Date reviewed:** 8/3/2022
Sample ID: 2A **Performed by:** B. Walter **Reviewed by:** B. Lemcke

I. GENERAL OBSERVATIONS

1. Sample Dimensions: Our analysis was performed on a 210 mm (8-1/4") x 102 mm (4") x 51 mm (2") thick lapped profile section and a 76 mm (3") x 52 mm (2") thin section that were saw-cut and prepared from the original 102 mm (4") diameter x 210 mm (8-1/4") long core.
2. Surface Conditions:
Outer: Rough, mortar eroded surface
Inner: Rough, mortar eroded and partially textured surface
3. Reinforcement: A 12 mm (1/2") diameter rebar was present at approximately 101 mm (4") depth from the inner surface. No corrosion observed.
4. General Physical Conditions: A macrocrack proceeded sub-perpendicularly from the inner surface to a depth of 115 mm (4-1/2") where it terminated at the cored edge.

The concrete was characterized by its very soft/porous paste, sparse coarse aggregate particles, and abundant fine aggregate that was uniformly graded. The sample required stabilization with a nylon hardener for preparation for the examination. The concrete exhibited carbonation up to approximately 76 mm (3") from the inner surface and up to 25 mm (1") from the outer surface. The pH indicator applied to document the carbonation depth did not display a deep or contrasted coloration – suggesting the entirety of the core was at least partially carbonated. The concrete was not air-entrained. No visual evidence of bulk expansive alkali-aggregate reactivity was observed. In thin section, the carbonated paste consisted of sparry or relatively coarse calcium carbonate (bi-carbonation or PCD, popcorn-calcite deposition). Additionally, ferrite portland cement phase exhibited a very light brown to orange coloration when viewed in thin section.

II. AGGREGATE

1. Coarse: 38 mm (1-1/2") nominal sized naturally occurring carbonate-rich gravel consisting of dolostone, partially silicified carbonate, greywacke, basalt, and granite. The particles were mostly sub-rounded in shape. The coarse aggregate was sparse in the core sample, appeared fairly graded, and exhibited poor overall distribution.
2. Fine: Natural quartz and feldspar sand with very few lithic and carbonate particles. The grains were mostly sub-rounded with many smaller sub-angular particles. The fine aggregate was uniformly graded, abundant, and exhibited good overall distribution.

III. CEMENTITIOUS PROPERTIES

1. Air Content: 5.3% total
2. Depth of carbonation: Fully to partially carbonated throughout
3. Paste/aggregate bond: Poor.
4. Paste color: Similar to very pale orange (Munsell® 10YR 8/2).
5. Paste hardness: Very soft (Mohs <2).
6. Microcracking: A macrocrack proceeded sub-perpendicularly from the inner surface to a depth of 115 mm (4-1/2") where it terminated at the cored edge.
7. Secondary deposits: Calcite was observed lining many air voids throughout the core sample.
8. w/cm: Estimated to be more than 0.65 with approximately 2 to 4% residual portland cement particles
9. Cement hydration: Alites: Fully
Belites: Fully

24-LAB-001 PETROGRAPHIC EXAMINATION OF HARDENED CONCRETE, ASTM C856

Project No. P-0014824 **Date:** 8/1/2022 **Date reviewed:** 8/9/2022
Sample ID: 3A **Performed by:** B. Walter **Reviewed by:** B. Lemcke

I. GENERAL OBSERVATIONS

1. **Sample Dimensions:** Our analysis was performed on a 203 mm (8") x 102 mm (4") x 51 mm (2") thick lapped profile section and a 76 mm (3") x 52 mm (2") thin section that were saw-cut and prepared from the original 102 mm (4") diameter x 203 mm (8") long core.
2. **Surface Conditions:**
Outer: Rough, eroded finished surface. Approximately 4 mm (5/32") to 6 mm (1/4") of edge ground away, likely during coring process.
Inner: Fairly smooth, formed surface placed in formwork.
3. **Reinforcement:** A 9 mm (3/8") diameter steel rebar was present approximately 25 mm (1") from the inner surface. No corrosion observed.
4. **General Physical Conditions:** Approximately 4 mm (5/32") to 6 mm (1/4") of the circumference of the outer surface was ground away, likely during coring process. The paste within the inner at least 3 mm (1/8") and up to 8 mm (5/16") was lighter in color, corresponding with depth of carbonation. Colorless to white acicular ettringite was observed sparsely lining a few air voids within the non-carbonated paste. The concrete was not air-entrained and was well consolidated. No visual evidence of bulk expansive alkali-aggregate reactivity was observed.

II. AGGREGATE

1. **Coarse:** 38 mm (1-1/2") nominal sized naturally occurring gravel consisting of dolostone, partially silicified carbonate, greywacke/siltstone, and basalt. The particles were mostly sub-rounded in shape. The coarse aggregate appeared well graded and exhibited fair overall distribution.
2. **Fine:** Natural quartz, feldspar, carbonate, and lithic sand. The grains were mostly sub-rounded with many smaller sub-angular particles. The fine aggregate appeared well graded and exhibited good to fair overall uniform distribution.

III. CEMENTITIOUS PROPERTIES

1. **Air Content:** 0.7% total
2. **Depth of carbonation:** Ranged from 1 mm (1/32") up to 8 mm (5/16") depth from the outer surface. Ranged from 3 mm (1/8") up to 8 mm (5/16") depth from the inner surface, and 'spiked' up to 14 mm (9/16") along microcracking.
3. **Paste/aggregate bond:** Good.

4. Paste color: Similar to very pale orange (Munsell® 10YR 8/2) overall. The carbonated paste ranging from 3 mm (1/8") to 8 mm (5/16") depth from the inner surface was grayish orange (Munsell® 10YR 7/4)
5. Paste hardness: Moderate (Mohs ≈ 3) overall, soft on the inner surface (Mohs 2.5).
6. Microcracking: A few microcracks were observed proceeding sub-perpendicularly from the formed inner and outer surfaces of the core to a maximum observed depth of 12 mm (1/2").
7. Secondary deposits: Colorless to white acicular ettringite was observed sparsely lining a few air voids within the non-carbonated paste.
8. w/cm: Estimated at between 0.40 and 0.50 with approximately 4 to 6% residual portland cement particles
9. Cement hydration: Alites: Fully
Belites: Fully

24-LAB-001 PETROGRAPHIC EXAMINATION OF HARDENED CONCRETE, ASTM C856

Project No. P-0014824 **Date:** 8/1/2022 **Date reviewed:** 8/9/2022
Sample ID: 4A **Performed by:** B. Walter **Reviewed by:** B. Lemcke

I. GENERAL OBSERVATIONS

1. Sample Dimensions: Our analysis was performed on a 210 mm (8-1/4") x 102 mm (4") x 44 mm (1-3/4") thick lapped profile section and a 76 mm (3") x 52 mm (2") thin section that were saw-cut and prepared from the original 102 mm (4") diameter x 210 mm (8-1/4") long core.
2. Surface Conditions:
Outer: Smooth to rough, formed surface, placed in formwork
Inner: Rough, mortar eroded surface; exhibiting dark discoloration.
3. Reinforcement: A 9 mm (3/8") diameter steel rebar was present at 16 mm (5/8") depth from the eroded inner surface. No corrosion observed.
4. General Physical Conditions: A concentration of larger coarse aggregates was observed within the inner approximately 101 mm (4") of the core sample. The inner surface was mortar eroded and black in coloration. No original surface was present, as such the depth of paste/concrete erosion from the inner surface was not determinable. The mortar erosion has exposed many coarse aggregate particles which have been 'cleaned' of paste. The mortar erosion was consistent with exposure to an acidic solution or vapor. Further, portions of paste along this surface exhibited a yellowish-orange coloration and contained secondary deposits of ettringite – consistent with exposure to sulfate-ion. The concrete was not air-entrained and was well consolidated. No visual evidence of bulk expansive alkali-aggregate reactivity was observed in the sample.

II. AGGREGATE

1. Coarse: 38 mm (1-1/2") nominal sized naturally occurring carbonate-rich gravel consisting of dolostone, partially silicified carbonate, greywacke, and basalt/rhyolite. The particles were mostly sub-rounded in shape. The coarse aggregate appeared fairly graded and exhibited fair overall distribution.
2. Fine: Natural quartz, feldspar, carbonate, and lithic sand. The grains were mostly sub-rounded. The fine aggregate appeared well graded and exhibited good overall uniform distribution.

III. CEMENTITIOUS PROPERTIES

1. Air Content: 1.3% total
2. Depth of carbonation: Ranged from 3 mm (1/8") up to 5 mm (3/16") depth from the outer surface.
3. Paste/aggregate bond: Good.

4. Paste color: Similar to very pale orange (Munsell® 10YR 8/2)
5. Paste hardness: Moderate (Mohs \approx 3) overall, very soft (Mohs $<$ 2) on the mortar eroded inner surface.
6. Microcracking: A few fine microcracks were observed within the inner few millimeters of the core sample, passing through paste and aggregates.
7. Secondary deposits: Colorless to white acicular ettringite was observed inside sparsely lining a few air voids within the non-carbonated paste.
8. w/cm: Estimated at between 0.45 and 0.55 with approximately 3 to 5% residual portland cement particles
9. Cement hydration: Alites: Fully
Belites: Fully



AIR VOID ANALYSIS

Project:
 City of De Pere Box Culvert Inspection
 De Pere, Wisconsin

Reported To:
 Ruekert Mielke
 1400 Lombardi Avenue, Suite 101S
 Green Bay, Wisconsin 54304

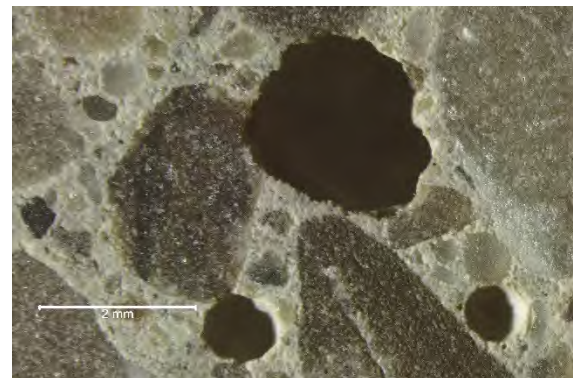
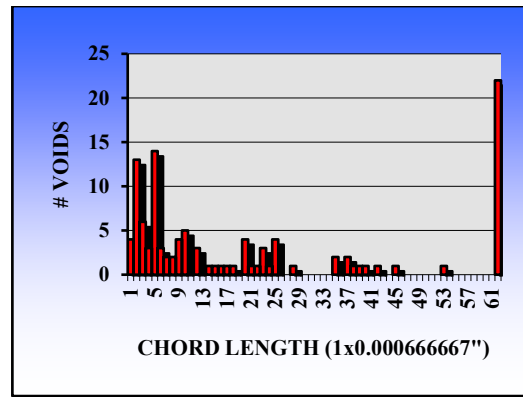
AET Project No.: P-0014824

Attn: Colin Meisel
Date: August 10, 2022

Sample: 1A
Conformance: The sample contains an air void system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance.

Sample Data
 Description: Hardened Concrete Core
 Dimensions: 102 mm (4") diameter
 x 210 mm (8-1/4") long
Test Data: By ASTM C457, Procedure A

Air Void Content %	2.8
Entrained, % < 0.040" (1mm)	0.7
Entrapped, % > 0.040" (1mm)	2.1
Air Voids/inch	1.1
Specific Surface, in ² /in ³	150
Spacing Factor, inches	0.032
Paste Content, % estimated	15
Magnification	75x
Traverse Length, inches	105
Test Date	8/1/2022
Technician	B. Walter



Magnification: 20x
 Description: Hardened air void system



AIR VOID ANALYSIS

Project:
City of De Pere Box Culvert Inspection
De Pere, Wisconsin

Reported To:
Ruekert Mielke
1400 Lombardi Avenue, Suite 101S
Green Bay, Wisconsin 54304

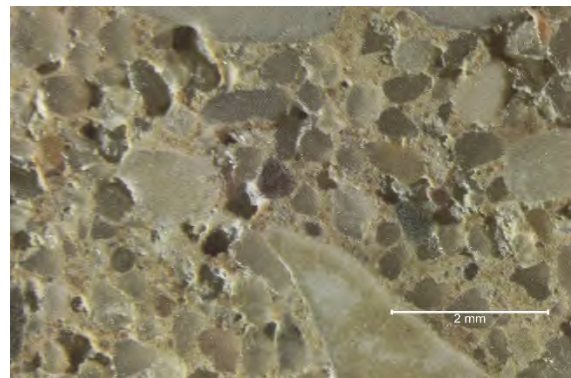
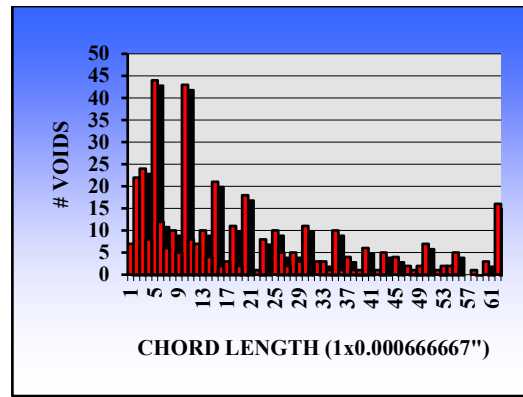
AET Project No.: P-0014824

Attn: Colin Meisel
Date: August 10, 2022

Sample: 2A
Conformance: The sample contains an air void system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance.

Sample Data
Description: Hardened Concrete Core
Dimensions: 102 mm (4") diameter
x 210 mm (8-1/4") long
Test Data: By ASTM C457, Procedure A

Air Void Content %	5.3
Entrained, % < 0.040" (1mm)	4.3
Entrapped, % > 0.040" (1mm)	1.0
Air Voids/inch	3.9
Specific Surface, in ² /in ³	290
Spacing Factor, inches	0.008
Paste Content, % estimated	13
Magnification	75x
Traverse Length, inches	100
Test Date	8/1/2022
Technician	B. Walter



Magnification: 20x
Description: Hardened air void system

AIR VOID ANALYSIS

Project:
City of De Pere Box Culvert Inspection
De Pere, Wisconsin

Reported To:
Ruekert Mielke
1400 Lombardi Avenue, Suite 101S
Green Bay, Wisconsin 54304

AET Project No.: P-0014824

Attn: Colin Meisel
Date: August 10, 2022

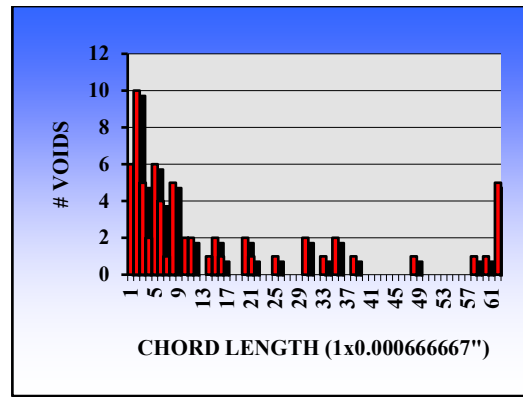
Sample: 3A
Conformance: The sample contains an air void system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance.

Sample Data

Description: Hardened Concrete Core
Dimensions: 102 mm (4") diameter
x 203 mm (8") long

Test Data: By ASTM C457, Procedure A

Air Void Content %	0.7
Entrained, % < 0.040" (1mm)	0.4
Entrapped, % > 0.040" (1mm)	0.3
Air Voids/inch	0.6
Specific Surface, in ² /in ³	310
Spacing Factor, inches	0.029
Paste Content, % estimated	17
Magnification	75x
Traverse Length, inches	105
Test Date	8/1/2022
Technician	B. Walter



Magnification: 32x
Description: Hardened air void system



AIR VOID ANALYSIS

Project:
City of De Pere Box Culvert Inspection
De Pere, Wisconsin

Reported To:
Ruekert Mielke
1400 Lombardi Avenue, Suite 101S
Green Bay, Wisconsin 54304

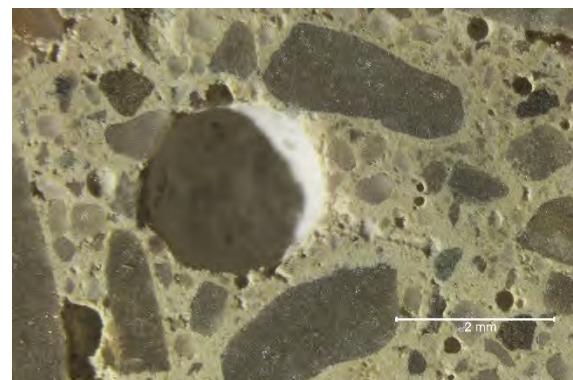
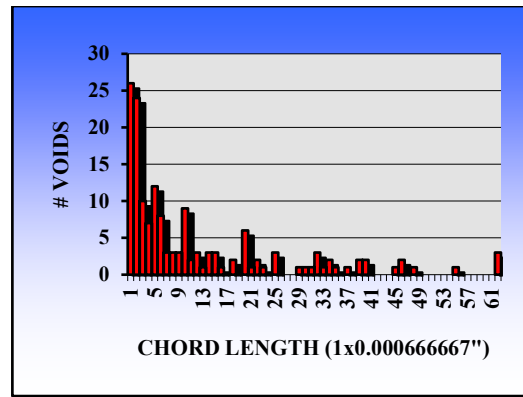
AET Project No.: P-0014824

Attn: Colin Meisel
Date: August 10, 2022

Sample: 4A
Conformance: The sample contains an air void system which is not consistent with current American Concrete Institute (ACI) recommendations for freeze-thaw resistance.

Sample Data
Description: Hardened Concrete Core
Dimensions: 102 mm (4") diameter
x 210 (8-1/4") long
Test Data: By ASTM C457, Procedure A

Air Void Content %	1.3
Entrained, % < 0.040" (1mm)	1.1
Entrapped, % > 0.040" (1mm)	0.2
Air Voids/inch	1.6
Specific Surface, in ² /in ³	480
Spacing Factor, inches	0.011
Paste Content, % estimated	16
Magnification	75x
Traverse Length, inches	100
Test Date	8/1/2022
Technician	B. Walter



Magnification: 20x
Description: Hardened air void system

Photo: 1



Sample ID:

1A

Description: Profile of the core sample as received with the outer surface to the left.

Photo: 2



Sample ID:

1A

Description: The outer surface of the sample as received in the laboratory, covered with soil.

Photo: 3



Sample ID:

1A

Description: The formed inner surface of the sample as received.

Photo: 4



Sample ID:

2A

Description: Profile of the core sample as received with the outer surface to the left.

Photo: 5



Sample ID:

2A

Description: The outer surface of the sample as received.

Photo: 6



Sample ID:

2A

Description: The rough, eroded inner surface of the sample as received.

Photo: 7



Sample ID:

3A

Description: Profile of the core sample as received with the outer surface to the left.

Photo: 8

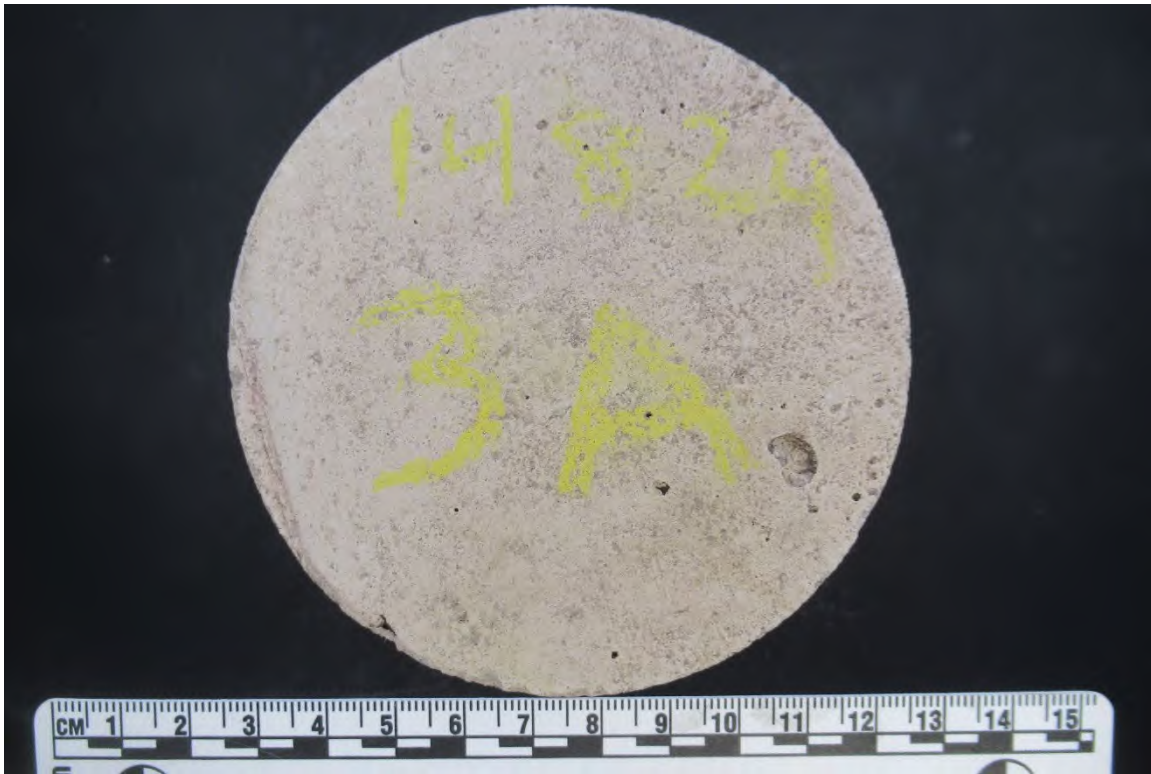


Sample ID:

3A

Description: The outer surface of the sample as received.

Photo: 9

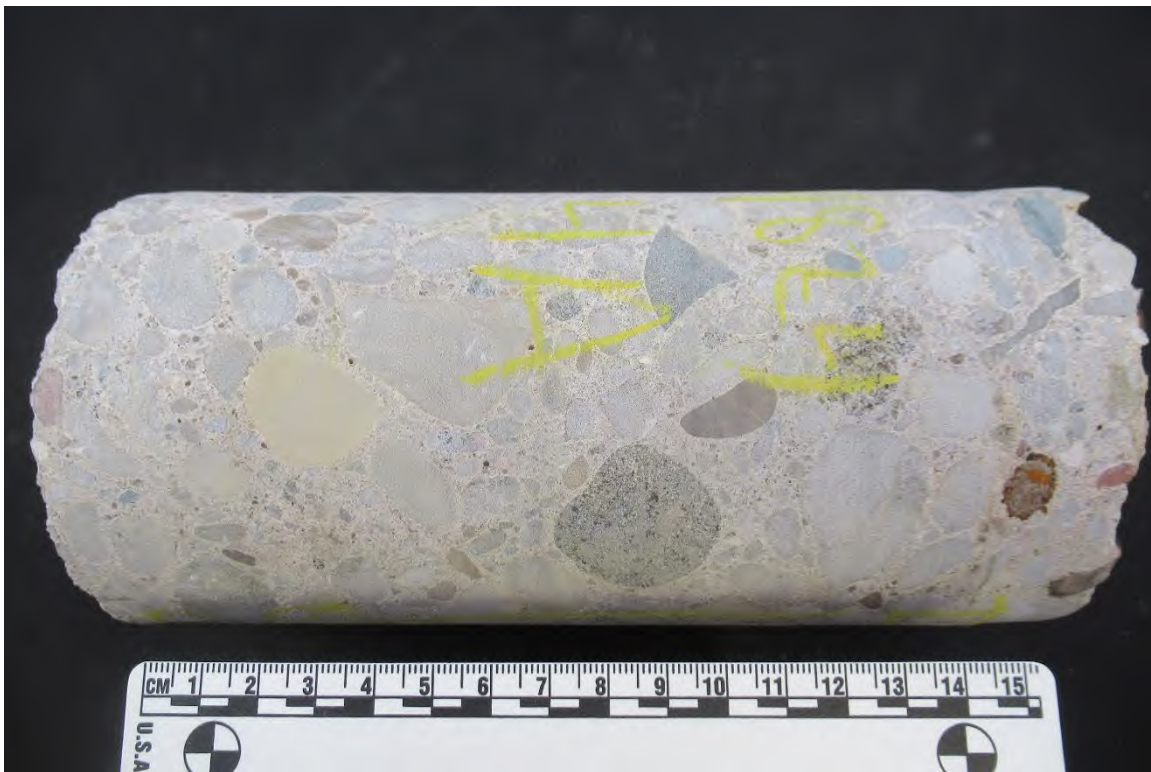


Sample ID:

3A

Description: The inner surface of the sample as received.

Photo: 10



Sample ID:

4A

Description: Profile of the core sample as received with the outer surface to the left.

Photo: 11



Sample ID:

4A

Description: The formed outer surface of the sample as received.

Photo: 12



Sample ID:

4A

Description: The mortar eroded and darkened inner surface of the sample as received.

Photo: 13



Sample ID:

1A

Description: Saw cut and lapped core profile with the outer surface to the left. Note some consolidation voids and paste/mortar rich areas within the outer 25 mm (1") of the core. Magenta stain from application of pH indicator.

Photo: 14

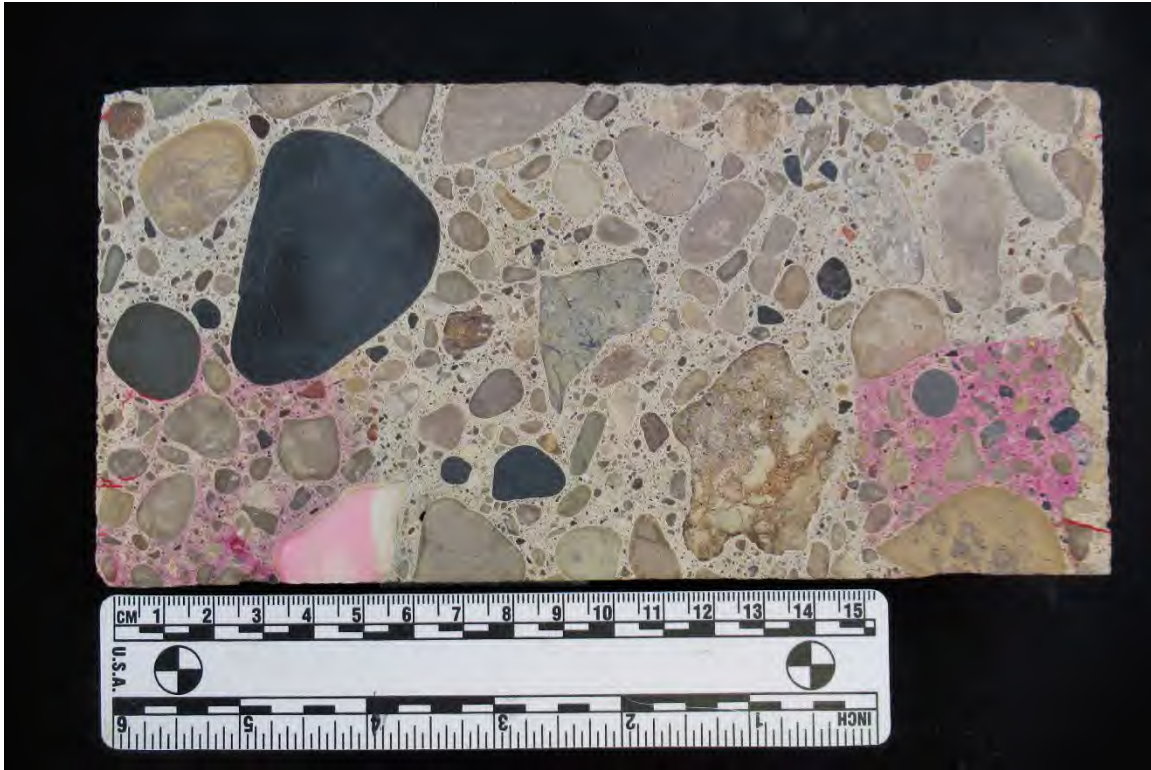


Sample ID:

2A

Description: Saw cut and lapped core profile with the outer surface to the left with macrocrack mapped in red ink. The concrete contained very few coarse aggregate particles and exhibited a very soft paste.

Photo: 15

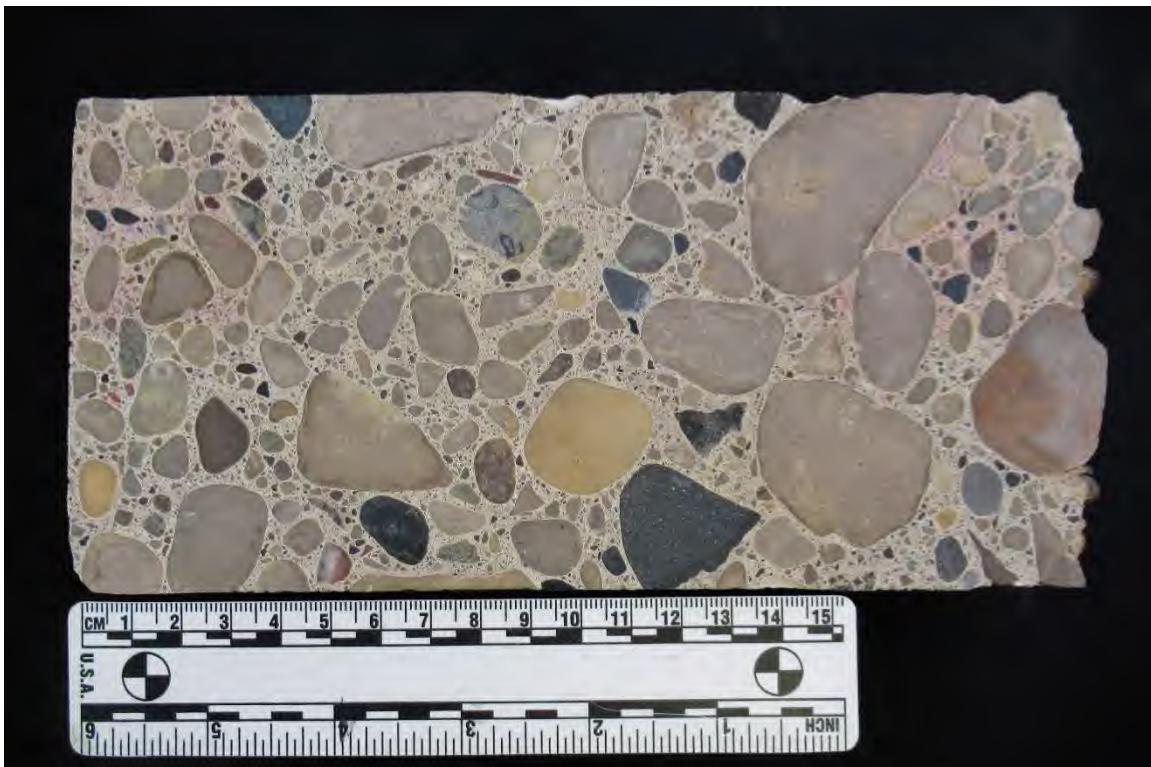


Sample ID:

3A

Description: Saw cut and lapped core profile with the outer surface to the left. Magenta stain from application of pH indicator.

Photo: 16



Sample ID:

4A

Description: Saw cut and lapped core profile with the outer surface to the left. Note the mortar eroded inner surface with exposed coarse aggregate particles. Magenta stain from application of pH indicator.

Photo: 17

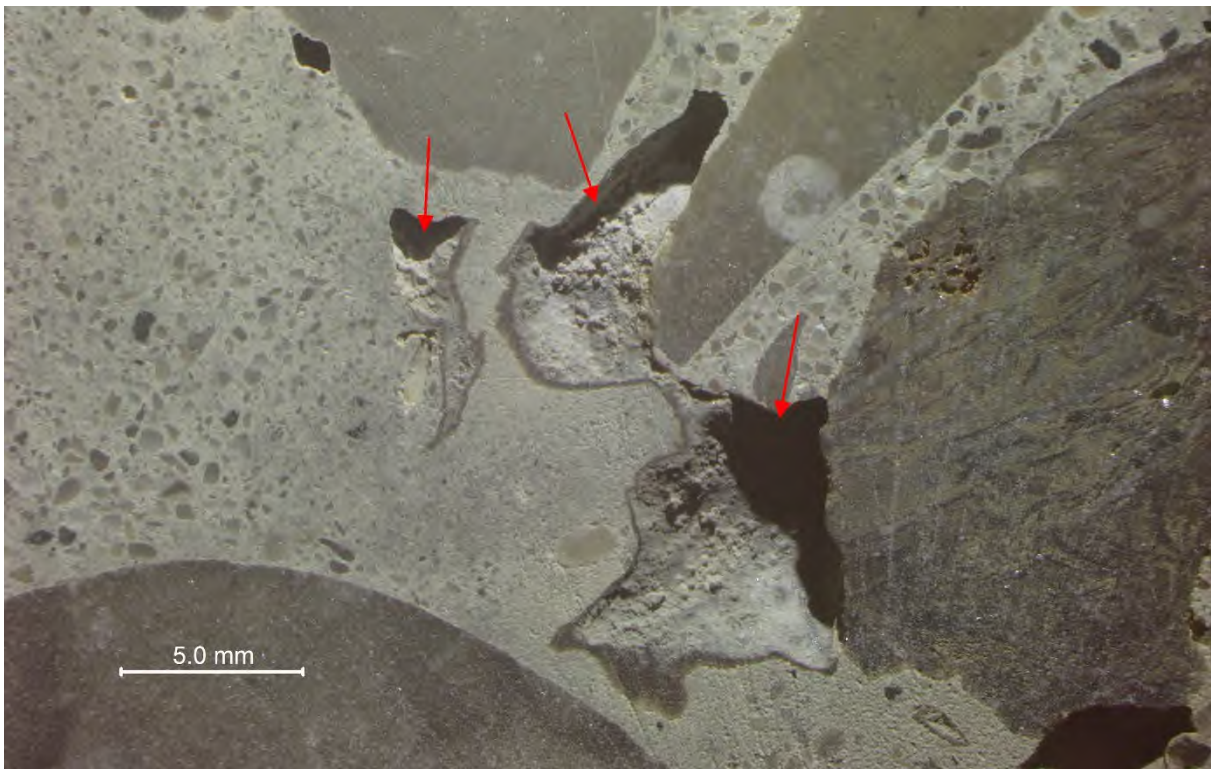


Sample ID:
Mag:

1A
3.5x

Description: Poorly consolidated outer surface of concrete viewed under magnification.

Photo: 18

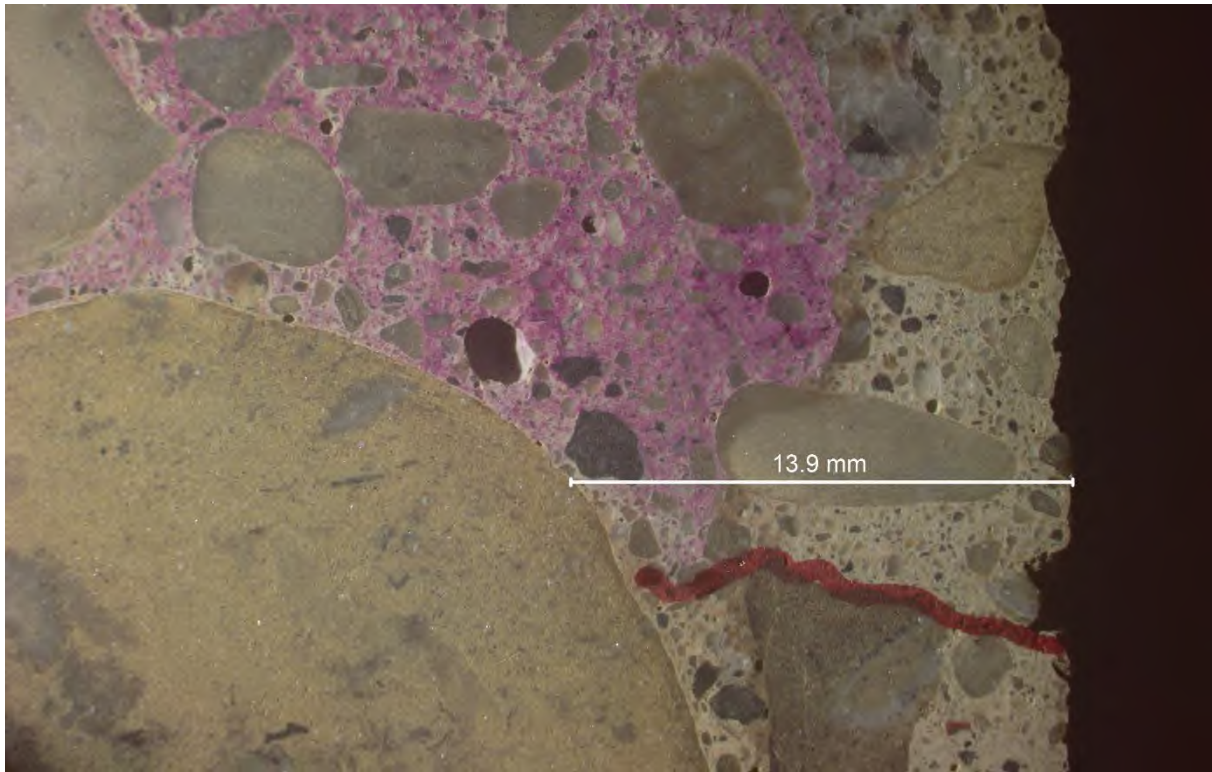


Sample ID:
Mag:

1A
3.5x

Description: Consolidation voids (red arrows) and mortar/paste-rich areas of the concrete within the outer 25 mm (1") of the core sample, viewed in saw cut and lapped profile under magnification.

Photo: 19



Sample ID:
Mag:

3A
3.5x

Description: Carbonation (unstained) 'spiked' up to 14 mm (9/16") depth along microcracking (traced in red) along the inner surface of the concrete, viewed in saw cut and lapped core profile under magnification.

Photo: 20

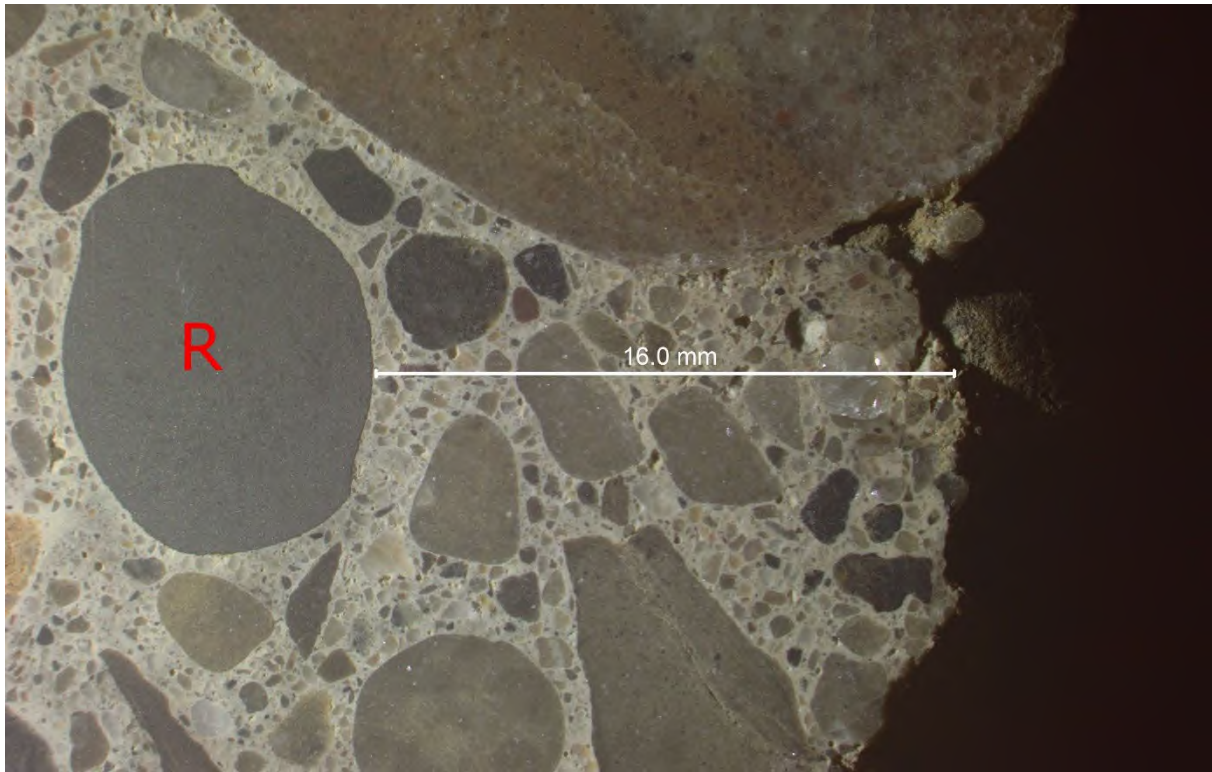


Sample ID:
Mag:

4A
3.5x

Description: Mortar eroded and darkened inner surface of concrete viewed under magnification.

Photo: 21

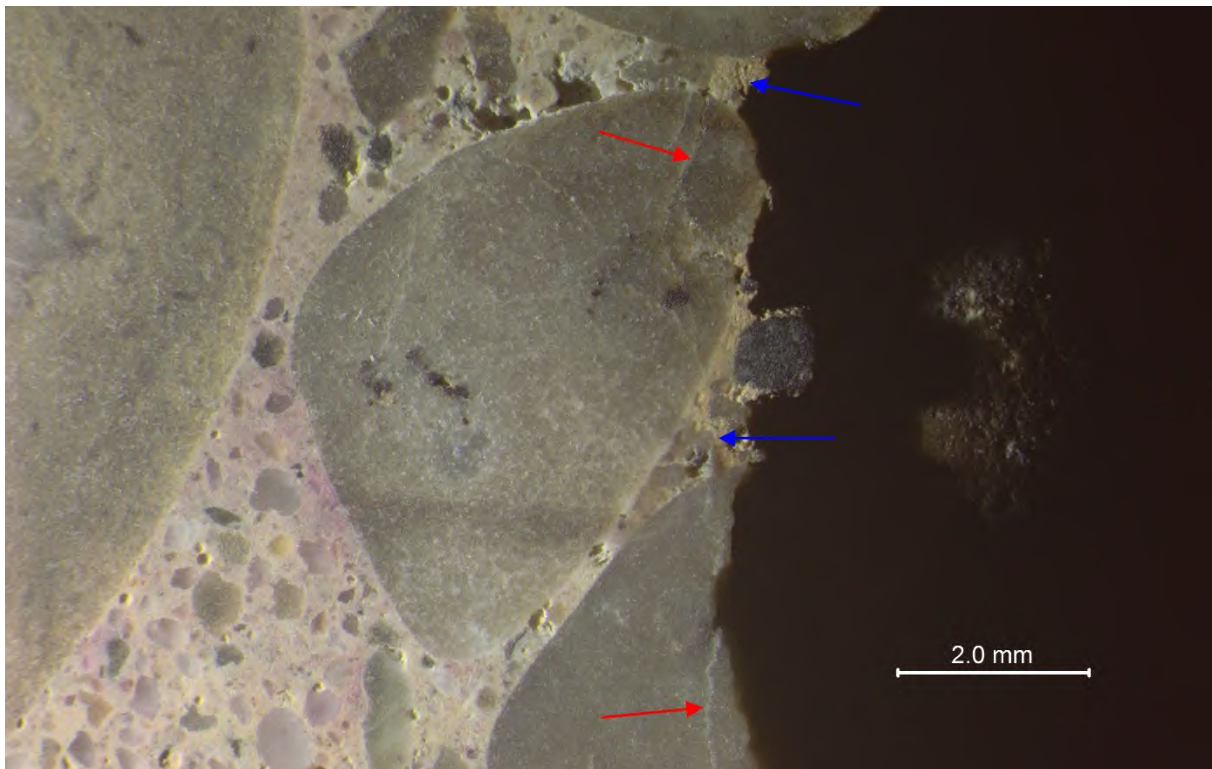


Sample ID:
Mag:

4A
3.5x

Description: Steel rebar reinforcement (R) present at approximately 16 mm (5/8") depth from the inner surface of the concrete (no corrosion observed). Viewed in saw cut and lapped core profile under magnification.

Photo: 22

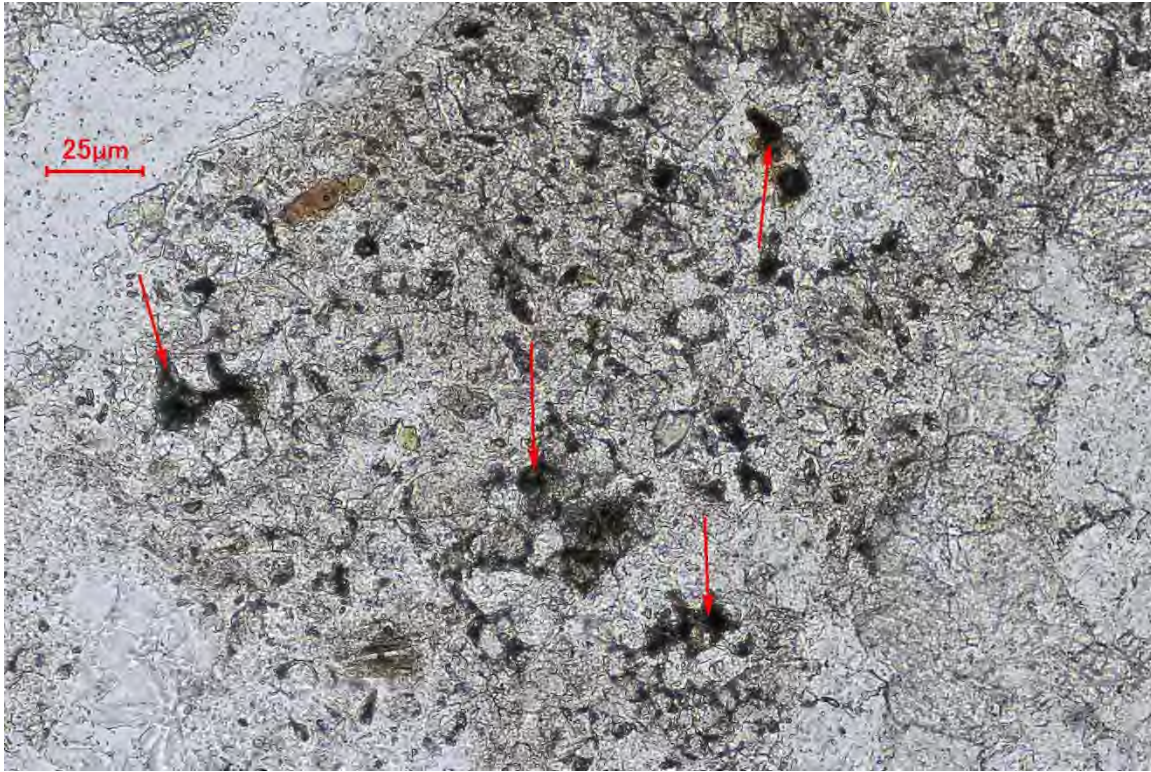


Sample ID:
Mag:

4A
10x

Description: Fine microcracking (red arrows) and discolored surface paste (blue arrows) along the mortar eroded inner surface of the concrete, viewed in saw cut and lapped core profile under magnification.

Photo: 23

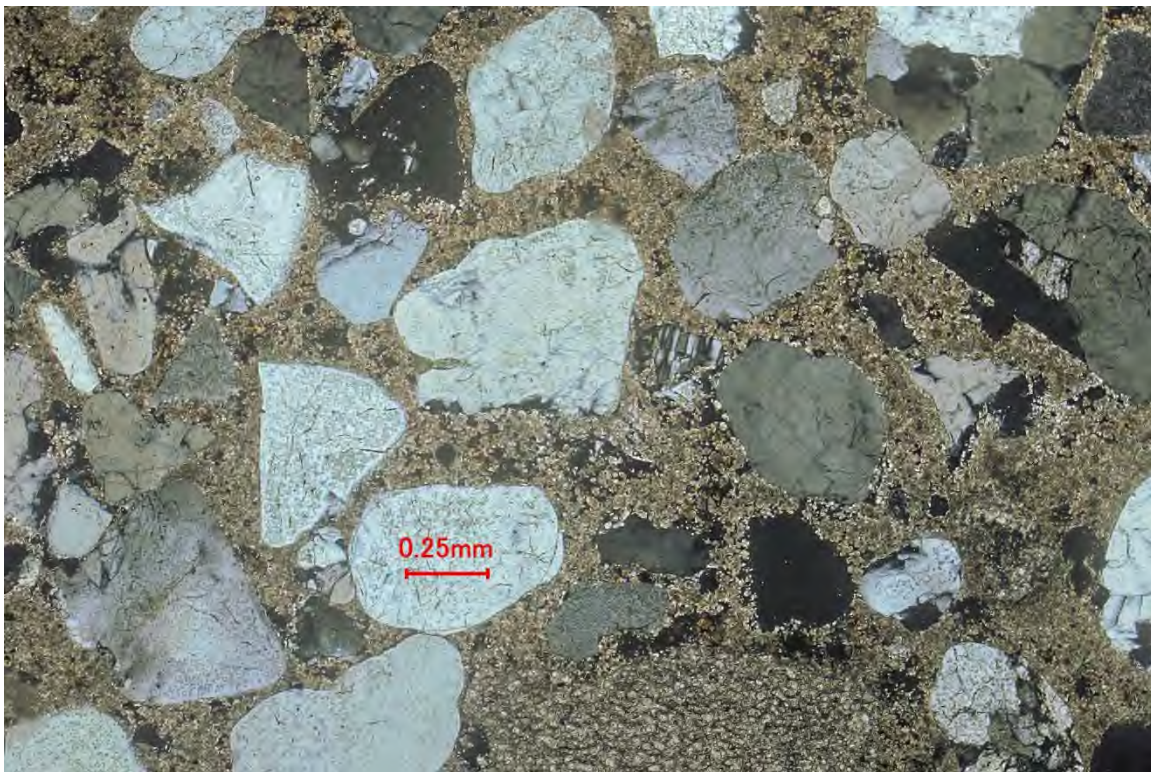


Sample ID:
Mag:

1A
400x

Description: Residual ferrite portland cement phase (red arrows) within concrete paste, viewed in thin section of core sample under transmitted plane polarized light.

Photo: 24

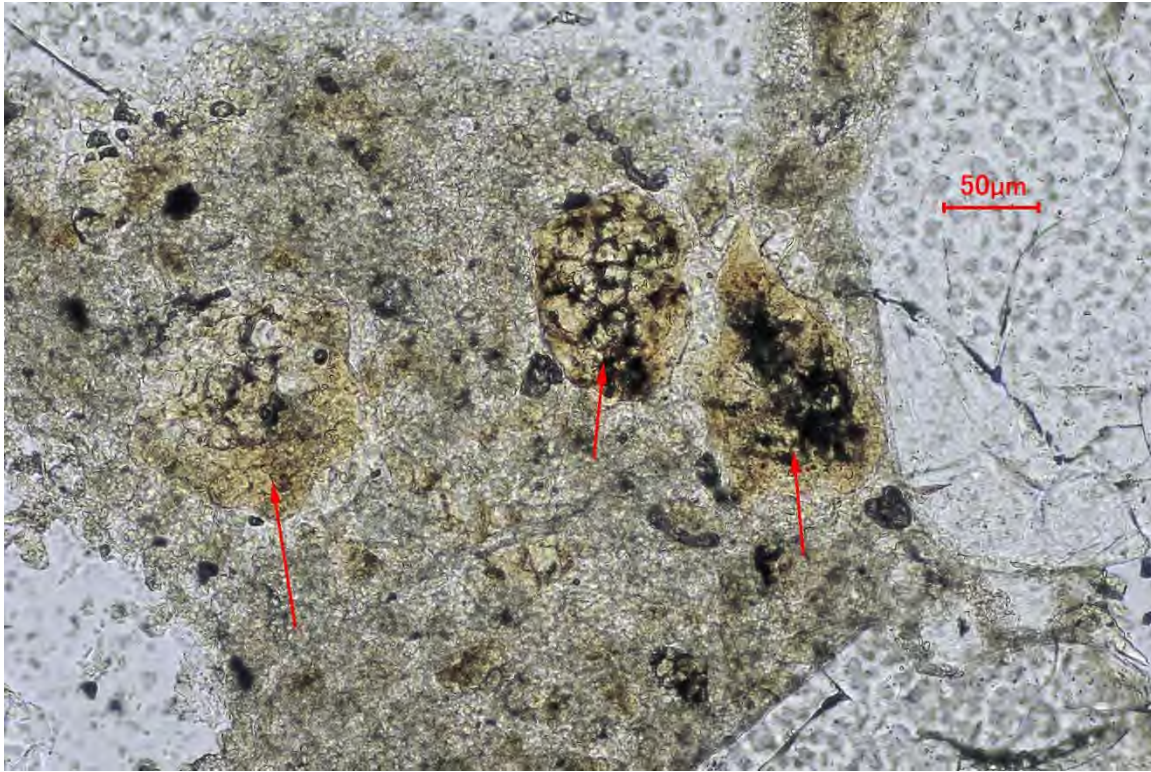


Sample ID:
Mag:

2A
40x

Description: Coarsely carbonated or bi-carbonated paste of concrete, viewed in thin section under transmitted cross polarized light.

Photo: 25

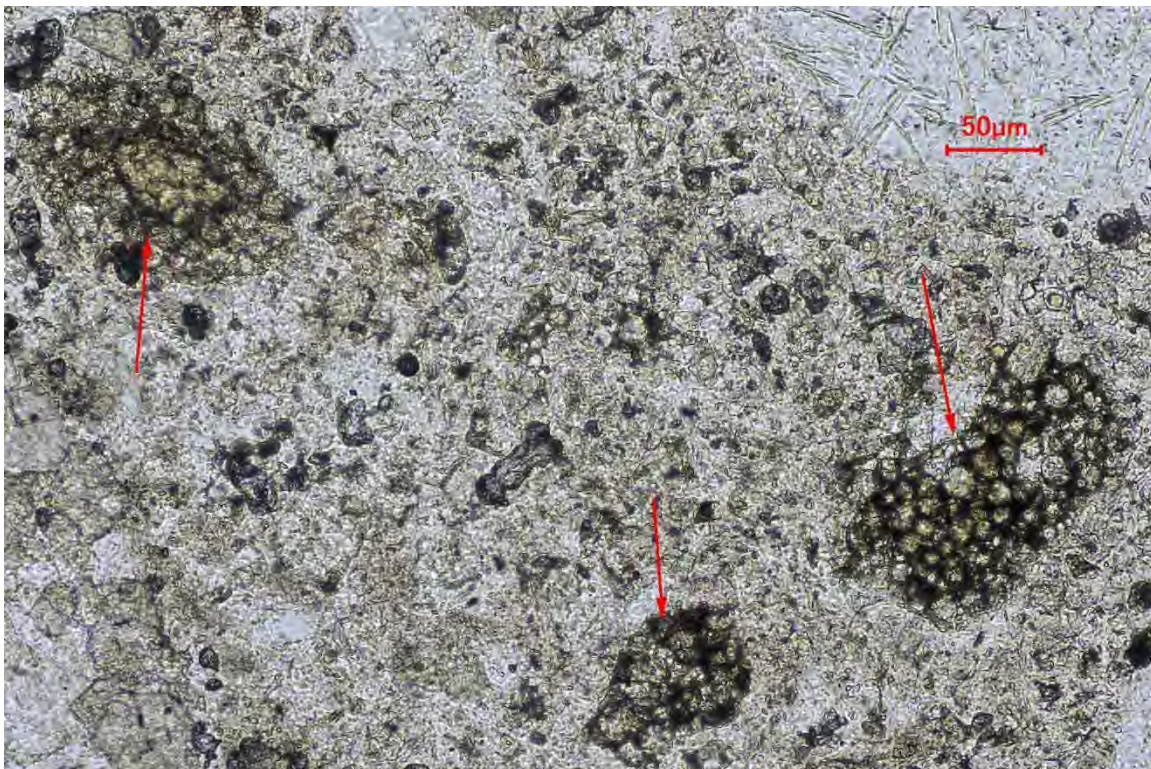


Sample ID:
Mag:

2A
200x

Description: Orange-stained or leached portland cement relics (red arrows) with some residual dark-colored ferrite phase present, viewed in thin section of concrete under transmitted plane polarized light.

Photo: 26



Sample ID:
Mag:

3A
400x

Description: Coarsely ground residual portland cement particles (red arrows) within concrete paste, viewed in thin section under transmitted plane polarized light.



American Engineering Testing, Inc.
 Wausau
 4203 Schofield Ave
 Schofield, WI 54476
 (715) 359-3534
 www.teamAET.com

Drilled Core Concrete Report

Report No: CC:AET-070322-C1

Issue No: 1

Client: Ruckert Mielke **CC:** AET-WAU
 Colin Meisel

Project: 2022 Concrete Box Culvert Inspection
 Grant Street

De Pere WI

Job No: P-0014824

This document shall not be reproduced, except in full, without written approval from American Engineering Testing, Inc.

Date of Issue:
Reviewed By:

7/26/2022
 Andrew Walters
 Staff Engineer

Sample Details

Sample ID: AET-070322-C1

Moisture Condition: SSD

Date Received: 07/14/22

Date Cored: 07/14/22

General Location: De Pere Box Culvert

Sample Details: 1: STA 11+30, 2: STA 21+12, 3: STA 21+65, 4: STA 28+00

Compressive Strength of Concrete Cores

ASTM C 42

Specimen ID	AET-070322-C1\1	AET-070322-C1\2	AET-070322-C1\3	AET-070322-C1\4
Date Tested	7/18/2022	7/18/2022	7/18/2022	7/18/2022
Time Tested				
Diameter (in)	3.96	3.95	3.96	3.95
Drilled Length (in)	8.25	8.25	8.00	8.25
Uncapped Length (in)	7.50	7.30	7.50	6.60
Capped Length (in)	7.70	7.55	7.75	6.85
L/D	1.94	1.91	1.96	1.73
Correction Factor	1.00	1.00	1.00	0.98
Area (in²)	12.32	12.25	12.32	12.25
Density (lb/ft³)				
Type of Cap	B	B	B	B
Nominal Aggregate Size (in)	0.8	0.8	0.8	0.8
Maximum Load (lbf)	84000	25627	106063	63766
Load Direction	Perpendicular	Perpendicular	Perpendicular	Perpendicular
Fracture Type/Remarks	2	4	4	4
Compressive Strength (psi)	6820	2090	8610	5200
Corrected Compressive Strength (psi)	6820	2090	8610	5100
Location	1	2	3	4

Average 28 Day Compressive Strength (psi):

Required Strength (psi):

Notes

1. Capping: B = Bonded ASTM 617,U = Unbonded ASTM C 1231

Remarks

Fracture Type: 2 = C39: Vert cracking/with cone; C1314 Cone & Shear, 4 = C39: Diagonal fracture; C1314: Tension break

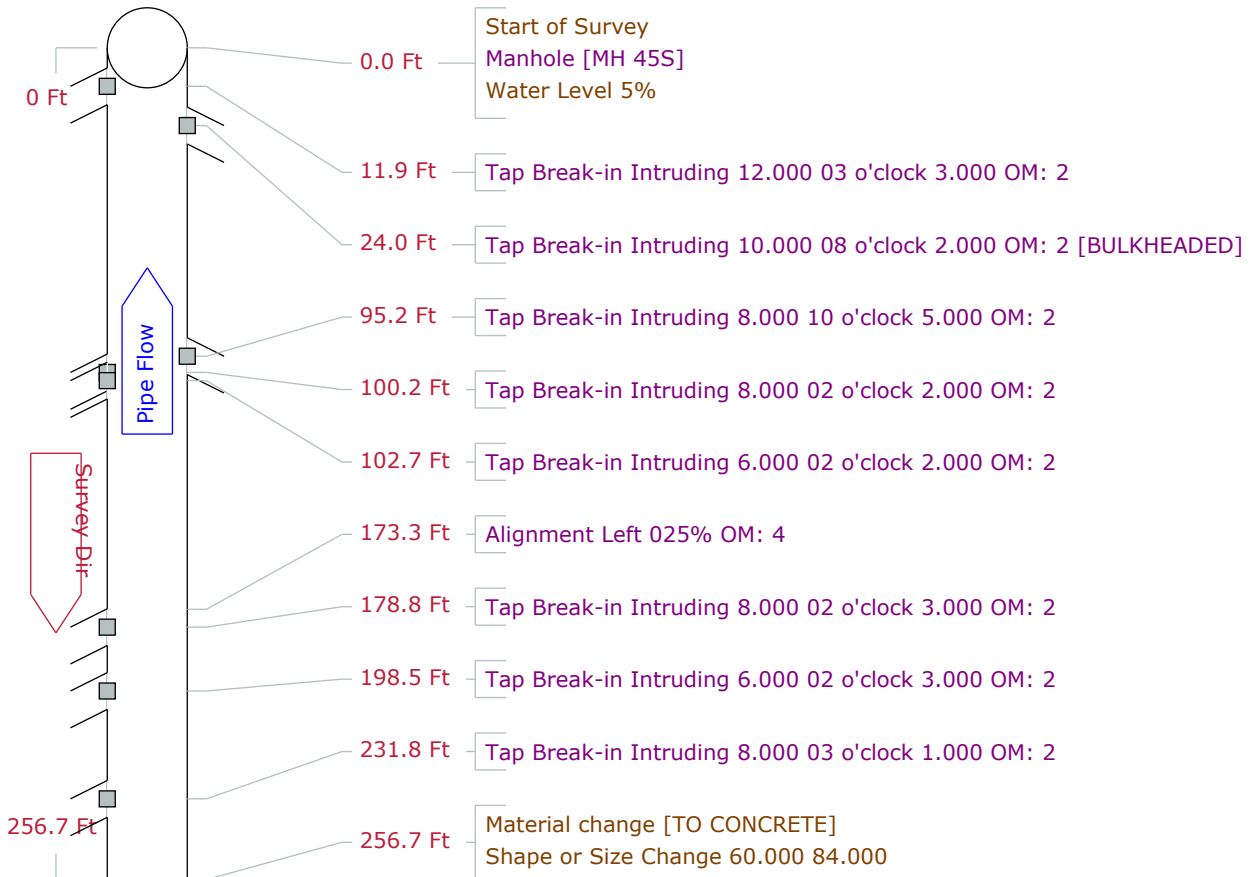
Core Locations:

1. Station 11+30, west wall, 27" down from ceiling
2. Station 21+12, east wall, 18" down from ceiling
3. Station 21+65, east wall, 18" down from ceiling
4. Station 28+00, west wall, 12" above floor

**APPENDIX C – TELEVISION REPORT
AND VIDEO**

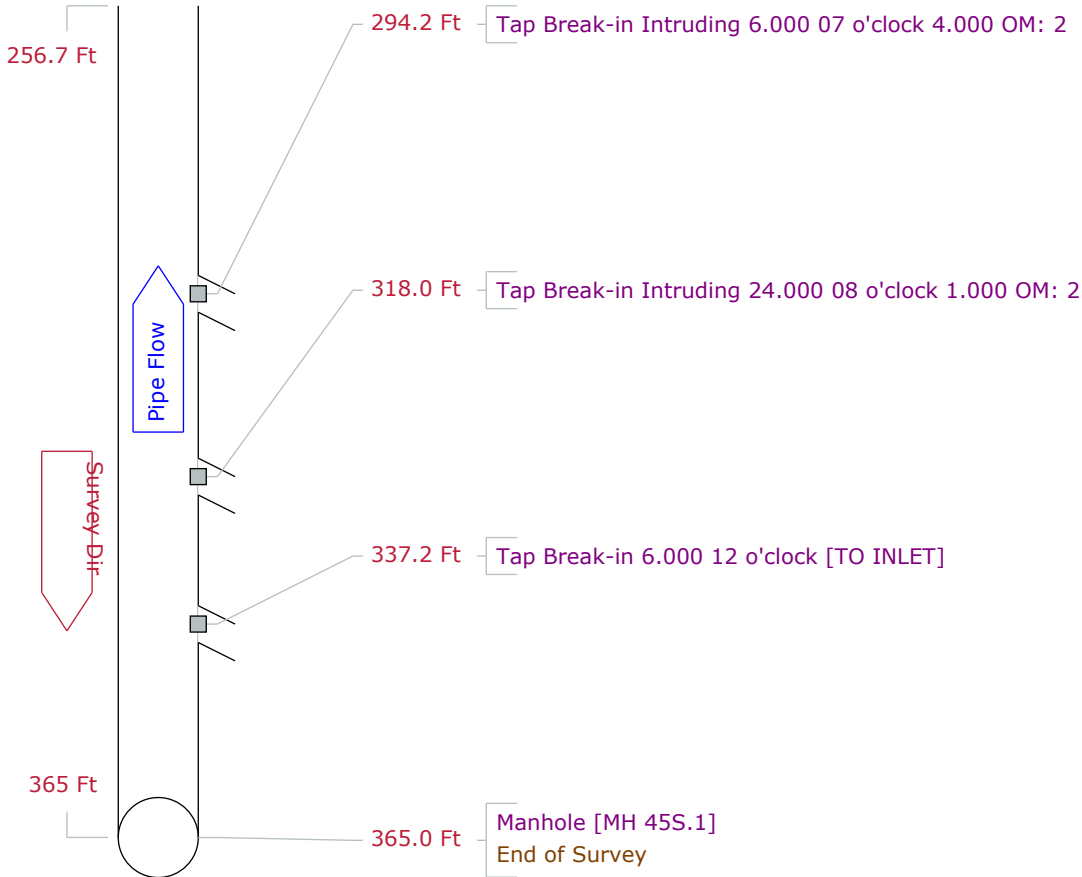
Pipe Graphic Report of PSR MH 45S.1 X for Ruekert & Mielke, Inc.

Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	8:24	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 45S.1	Rim to invert	10.10	Grade to invert		Rim to grade	Ft
Down	MH 45S	Rim to invert	7.90	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Circular	Height	48	Width	ins	Preclean	N
Material	Other	Joint length	Ft	Total length	365.0 Ft	Length Surveyed	365.00 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic	Constructional	
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Pipe Graphic Report of PSR MH 45S.1 X for Ruekert & Mielke, Inc.

Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	8:24	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 45S.1	Rim to invert	10.10	Grade to invert		Rim to grade	Ft
Down	MH 45S	Rim to invert	7.90	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Circular	Height	48	Width	ins	Preclean	N
Material	Other	Joint length	Ft	Total length	365.0 Ft	Length Surveyed	365.00 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment			Cat			
Additional info				Structural		O & M	
Location				Miscellaneous		Hydraulic	
Project				De Pere 22251 STM		Work Order	
Northing				Easting		Elevation	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/15	Setup 1
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 11.9 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 21.jpg



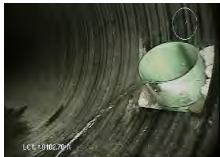
Video Index Count 24.0 Ft
 Code Tap Break-in Intruding
 Remarks BULKHEADED
 File Name 22.jpg



Video Index Count 95.2 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 23.jpg



Video Index Count 100.2 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 24.jpg



Video Index Count 102.7 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 25.jpg



Video Index Count 178.8 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 26.jpg



Video Index Count 198.5 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 27.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 1
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 231.8 Ft

Code Tap Break-in Intruding

Remarks

File Name 28.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 1
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 294.2 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 29.jpg



Video Index Count 318.0 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 30.jpg

Work Order	22251STM	Survey Date	2022/07/15	Setup 1
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 45S.1

X

for Ruekert & Mielke, Inc.

Setup 1	Surveyor Bill Krohn	Certificate # U609-1885	System Owner City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.		
P/O #	Date 2022/07/15	Time 8:24	Street Box Sewer Storm Lines
City De Pere	Further location details		
Up MH 45S.1	Rim to invert 10.10	Grade to invert	Rim to grade Ft
Down MH 45S	Rim to invert 7.90	Grade to invert	Rim to grade Ft
Use Stormwater	Direction Up	Flow control	Media No 22251STM
Shape Circular	Height 48 Width	ins Preclean N	Date Cleaned
Material Other	Joint length	Ft Total length 365.0 Ft	Length Surveyed 365.0 Ft
Lining	Year laid	Year rehabilitated	Weather Light Rain
Purpose Routine Assessment	Cat	Pressure	
Additional info			Structural O & M Constructional
Location Light Highway			Miscellaneous
Project De Pere 22251 STM	Work Order		
Northing	Easting	Elevation	
Coordinate System	GPS Accuracy		

Count	Video	CD Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST							Start of Survey
0.0		AMH							Manhole
0.0		MWL			5				Water Level
11.9		TBI	12.000	3.000		03	0001		
24.0		TBI	10.000	2.000		08	0002		BULKHEADED
95.2		TBI	8.000	5.000		10	0003		
100.2		TBI	8.000	2.000		02	0004		
102.7		TBI	6.000	2.000		02	0005		
173.3		LL			25				Alignment Left
178.8		TBI	8.000	3.000		02	0006		
198.5		TBI	6.000	3.000		02	0007		
231.8		TBI	8.000	1.000		03	0008		
256.7		MMC							Material change
256.7		MSC	60.000	84.000					Shape or Size Change
294.2		TBI	6.000	4.000		07	0009		
318.0		TBI	24.000	1.000		08	0010		
337.2		TB	6.000			12			TO INLET
365.0		AMH							Manhole
365.0		FH							End of Survey

365.0 Ft Total Length Surveyed

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 24	Pipe Ratings Index 2.2	Quick Rating 412A
	Overall	Pipe Rating 24	Pipe Ratings Index 2.2	Quick Rating 412A

Notes

MH 45S
 Refaced construction
 No steps
 No Cretex seal
 Open pick hole

MH 45S.1 (MH at Grant St.)
 Brick construction / Good condition
 No Cretex seal

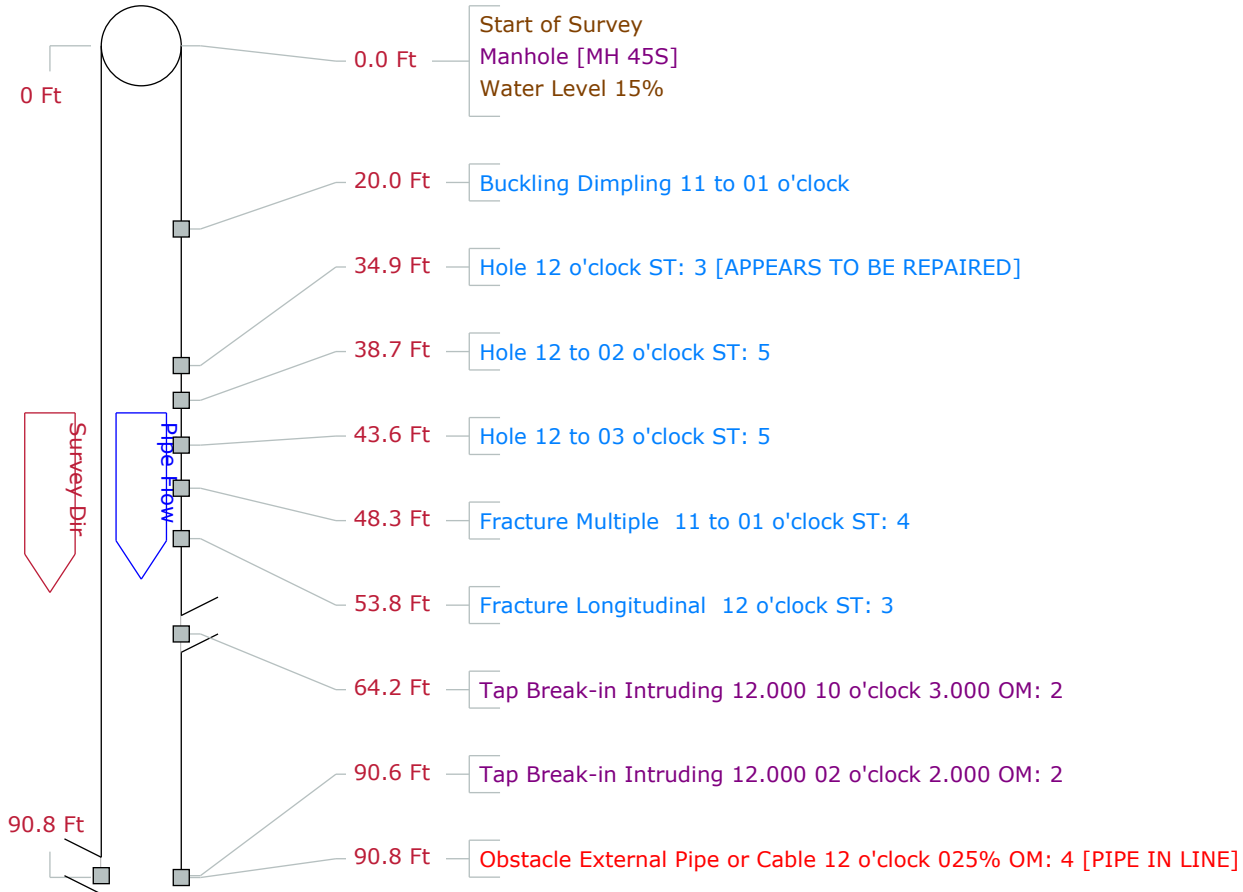
Section measures 366'



Great Lakes TV Seal, Inc.
 Phone:920-863-3663
 Fax:920-863-3662

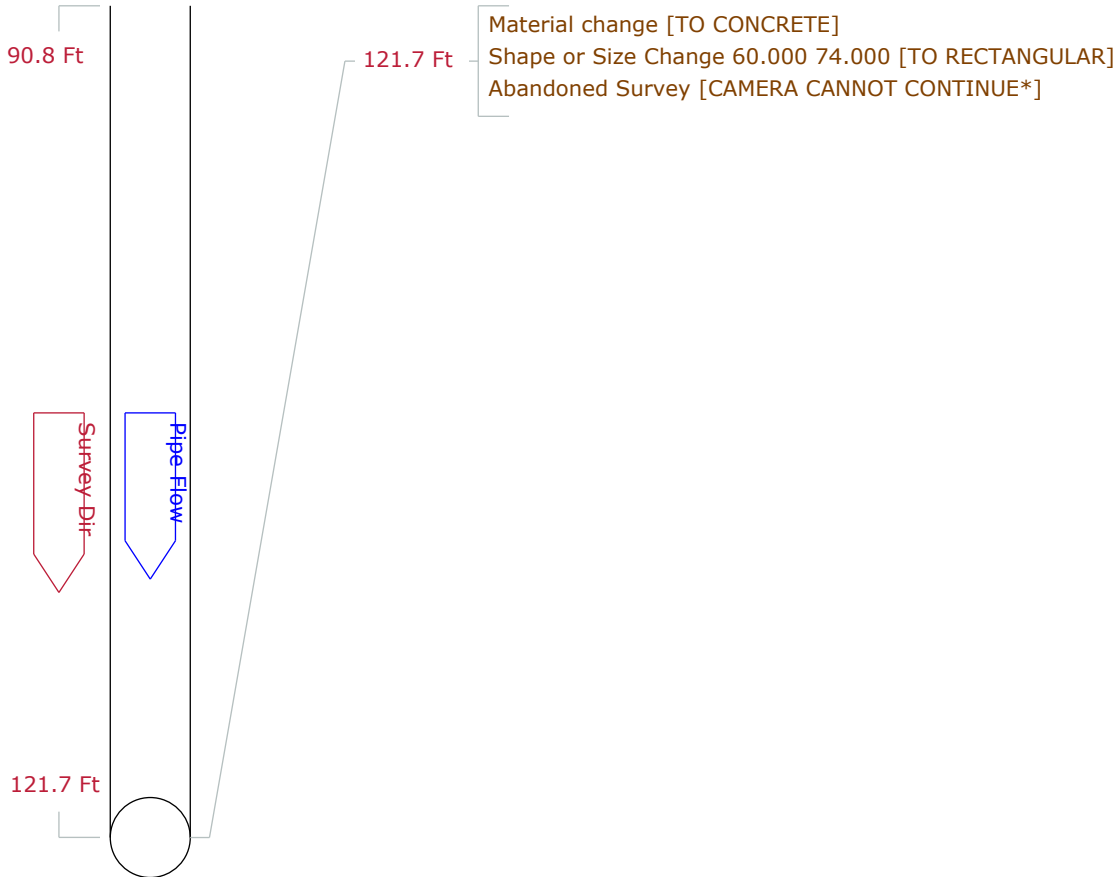
Pipe Graphic Report of PSR MH 45S X for Ruekert & Mielke, Inc.

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	9:08	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 45S	Rim to invert	7.90	Grade to invert		Rim to grade	Ft
Down	MH 46S	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control		Media No	22251STM
Shape	Circular	Height	48	Width	ins	Preclean	N
Material	Other	Joint length	Ft	Total length	Ft	Length Surveyed	121.70 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic	Constructional	
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Pipe Graphic Report of PSR MH 45S X for Ruekert & Mielke, Inc.

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	9:08	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S	Rim to invert	7.90	Grade to invert		Rim to grade	Ft
Down	MH 46S	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control		Media No	22251STM
Shape	Circular	Height	48	Width	ins	Preclean N	Date Cleaned
Material	Other	Joint length	Ft	Total length	Ft	Length Surveyed	121.70 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Elevation	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/15	Setup 2
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 34.9 Ft
 Code [Hole](#)
 Remarks APPEARS TO BE REPAIRED
 File Name 31.jpg



Video Index Count 38.7 Ft
 Code [Hole](#)
 Remarks
 File Name 32.jpg



Video Index Count 43.6 Ft
 Code [Hole](#)
 Remarks
 File Name 33.jpg



Video Index Count 48.3 Ft
 Code [Fracture Multiple](#)
 Remarks
 File Name 34.jpg



Video Index Count 53.8 Ft
 Code [Fracture Longitudinal](#)
 Remarks
 File Name 35.jpg



Video Index Count 64.2 Ft
 Code [Tap Break-in Intruding](#)
 Remarks
 File Name 36.jpg



Video Index Count 90.6 Ft
 Code [Tap Break-in Intruding](#)
 Remarks
 File Name 37.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 2
Path to picture files	Q:\2022 PIPELOGIX\Snapshots\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 90.8 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks PIPE IN LINE
 File Name 38.jpg



Tabular Report of PSR MH 45S

X

for Ruekert & Mielke, Inc.

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	9:08	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S	Rim to invert	7.90	Grade to invert		Rim to grade	Ft
Down	MH 46S	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Down	Flow control		Media No	22251STM
Shape	Circular	Height	48	Width	ins	Preclean	N
Material	Other	Joint length	Ft	Total length	Ft	Length Surveyed	121.7 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						De Pere 22251 STM	
Northing						Easting	
Coordinate System						GPS Accuracy	
						Work Order	Elevation

Count	Video	CD Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST							Start of Survey
0.0		AMH							Manhole
0.0		MWL			15				Water Level
20.0		KD				11	01		Buckling Dimpling
34.9		H				12		0001	Hole
38.7		H				12	02	0002	Hole
43.6		H				12	03	0003	Hole
48.3		FM				11	01	0004	Fracture Multiple
53.8		FL				12		0005	Fracture Longitudinal
64.2		TBI	12.000	3.000		10		0006	Tap Break-in Intruding
90.6		TBI	12.000	2.000		02		0007	Tap Break-in Intruding
90.8		OBP			25	12		0008	Obstacle External Pipe or Cable
121.7		MMC							Material change
121.7		MSC	60.000	74.000					Shape or Size Change
121.7		MSA							Abandoned Survey

121.7 Ft Total Length Surveyed

Notes	Scores	Structural:	Pipe Rating 20	Pipe Ratings Index 4	Quick Rating 5241
		O&M:	Pipe Rating 8	Pipe Ratings Index 2.7	Quick Rating 4122
		Overall	Pipe Rating 28	Pipe Ratings Index 6.7	Quick Rating 5242

MH 45S
 Refaced construction
 No Steps
 No Cretex seal
 Open pick hole

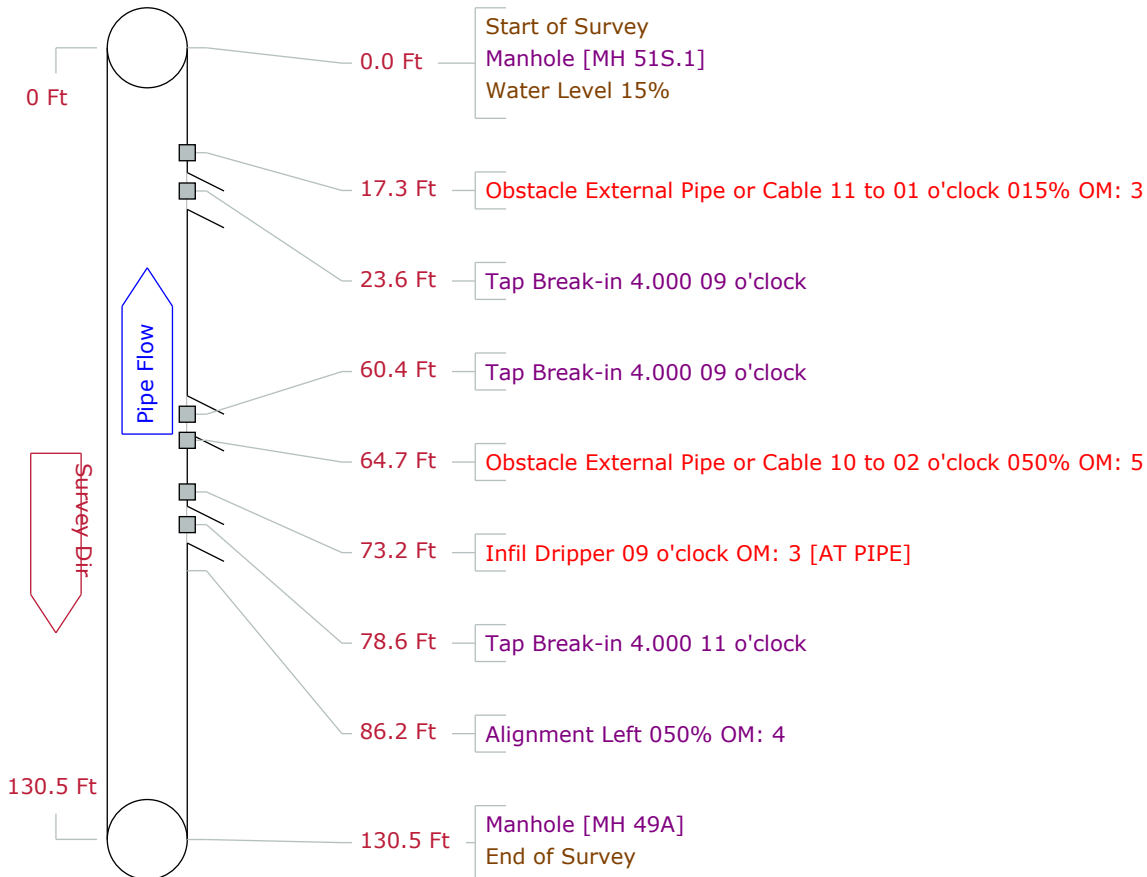
MH 46S
 Buried MH

*Note: At 121.7' camera cannot continue due to change in pipe shape and size
 Will do a reverse setup / See setup 6



Pipe Graphic Report of PSR MH 49A X for Ruekert & Mielke, Inc.

Setup	3	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	10:00	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 49A	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 51S.1	Rim to invert 5.90		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	130.5 Ft	Length Surveyed	130.50 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Elevation	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/15	Setup 3
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 17.3 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 42.jpg



Video Index Count 64.7 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 43.jpg



Video Index Count 73.2 Ft
 Code **Infil Dripper**
 Remarks AT PIPE
 File Name 44.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 3
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 49A X for Ruekert & Mielke, Inc.

Setup	3	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	10:00	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 49A	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 51S.1	Rim to invert	5.90	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length	130.5 Ft	Length Surveyed
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						De Pere 22251 STM	
Northing						Easting	
Coordinate System						GPS Accuracy	
						Work Order	
						Elevation	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 51S.1
0.0			MWL Water Level			15				
17.3			OBP Obstacle External Pipe or Cable			15	11	01	0001	
23.6			TB Tap Break-in	4.000			09			
60.4			TB Tap Break-in	4.000			09			
64.7			OBP Obstacle External Pipe or Cable			50	10	02	0002	
73.2			ID Infil Dripper				09		0003	AT PIPE
78.6			TB Tap Break-in	4.000			11			
86.2			LL Alignment Left			50				
130.5			AMH Manhole							MH 49A
130.5			FH End of Survey							

130.5 Ft Total Length Surveyed

Notes	Scores	Structural: Pipe Rating	0	Pipe Ratings Index	0	Quick Rating	0000
		O&M: Pipe Rating	15	Pipe Ratings Index	3.8	Quick Rating	5141
		Overall Pipe Rating	15	Pipe Ratings Index	3.8	Quick Rating	5141

MH 51S.1 (MH behind church)

Casting set on top pipe
Has storm cover

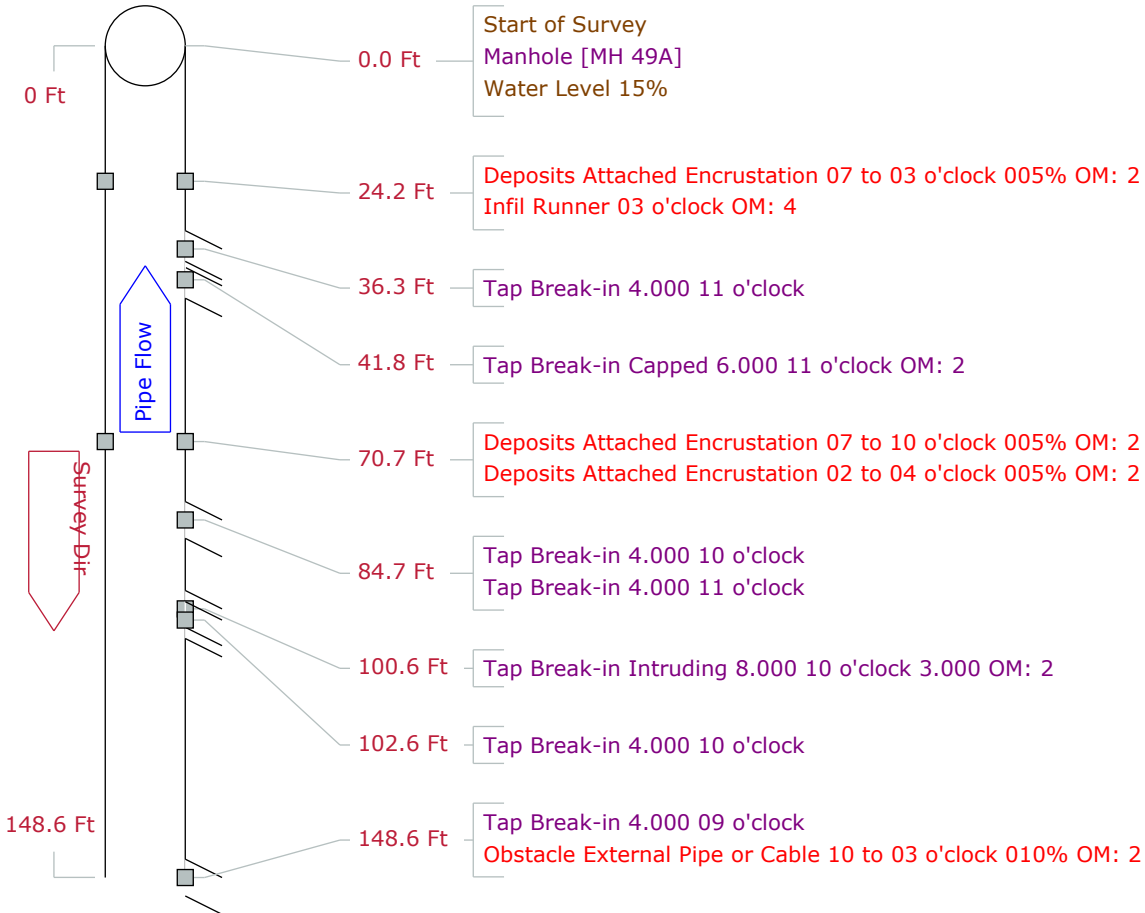
MH49A

Brick construction
Bricks deteriorated
Open pick hole



Pipe Graphic Report of PSR MH 49S X for Ruekert & Mielke, Inc.

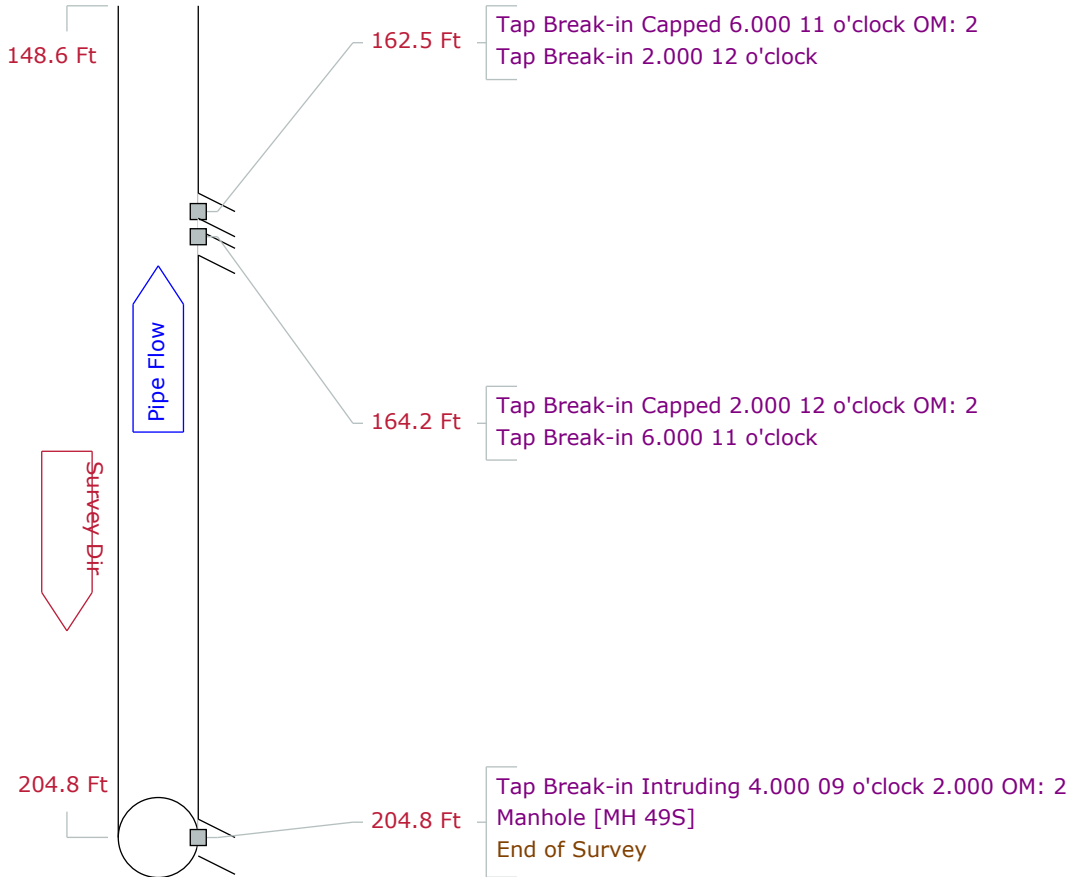
Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	10:12	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Down	MH 49A	Rim to invert	17.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	204.8 Ft	Length Surveyed	204.80 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic	Constructional	
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Great Lakes TV Seal, Inc.
 Phone: 920-863-3663
 Address: 3600 Kewaunee Rd., Green Bay, WI
 Fax: 920-863-3662

Pipe Graphic Report of PSR MH 49S X for Ruekert & Mielke, Inc.

Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	10:12	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Down	MH 49A	Rim to invert	17.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	204.8 Ft	Length Surveyed	204.80 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Easting	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/15	Setup 4
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 148.6 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 45.jpg



Video Index Count 204.8 Ft
 Code **Tap Break-in Intruding**
 Remarks
 File Name 46.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 4
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 49S

X

for Ruekert & Mielke, Inc.

Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	10:12	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Down	MH 49A	Rim to invert	17.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	204.8 Ft	Length Surveyed	204.8 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						De Pere 22251 STM	
Northing						Easting	
Coordinate System						GPS Accuracy	
						Work Order	
						Elevation	

Count	Video	CD Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST							Start of Survey
0.0		AMH							Manhole
0.0		MWL			15				Water Level
24.2		DAE			5	J	07	03	Deposits Attached Encrustation
24.2		IR					03		Infil Runner
36.3		TB	4.000				11		Tap Break-in
41.8		TBC	6.000				11		Tap Break-in Capped
70.7		DAE			5	J	07	10	Deposits Attached Encrustation
70.7		DAE			5	J	02	04	Deposits Attached Encrustation
84.7		TB	4.000				10		Tap Break-in
84.7		TB	4.000				11		Tap Break-in
100.6		TBI	8.000	3.000			10		Tap Break-in Intruding
102.6		TB	4.000				10		Tap Break-in
148.6		TB	4.000				09		Tap Break-in
148.6		OBP			10		10	03	0001
162.5		TBC	6.000				11		Tap Break-in Capped
162.5		TB	2.000				12		Tap Break-in
164.2		TBC	2.000				12		Tap Break-in Capped
164.2		TB	6.000				11		Tap Break-in
204.8		TBI	4.000	2.000			09	0002	Tap Break-in Intruding
204.8		AMH							Manhole
204.8		FH							End of Survey

204.8 Ft Total Length Surveyed



Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	10:12	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Down	MH 49A	Rim to invert	17.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84	ins	Preclean N
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length	204.8	Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info				Structural O & M Constructional Miscellaneous			
Location	Light Highway			Work Order			
Project	De Pere 22251 STM			Elevation			
Northing	Easting			GPS Accuracy			
Coordinate System							

Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
	O&M:	Pipe Rating 22	Pipe Ratings Index 2.2	Quick Rating 4129
	Overall	Pipe Rating 22	Pipe Ratings Index 2.2	Quick Rating 4129

Notes

MH 49A

- Brick construction
- Bricks deteriorated
- Open pick hole

MH 49S

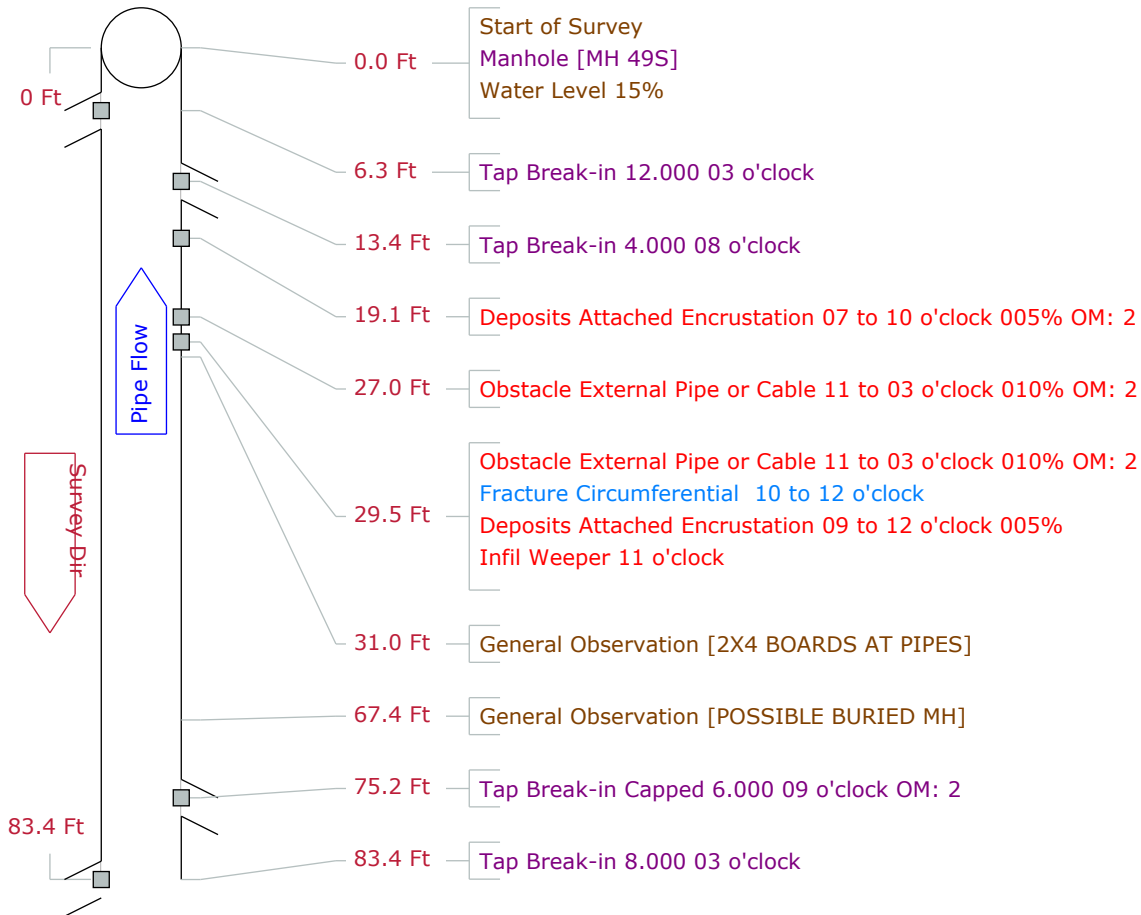
- Precast construction / Good condition
- Has storm cover

Section measures 260'



Pipe Graphic Report of PSR MH 45S X for Ruekert & Mielke, Inc.

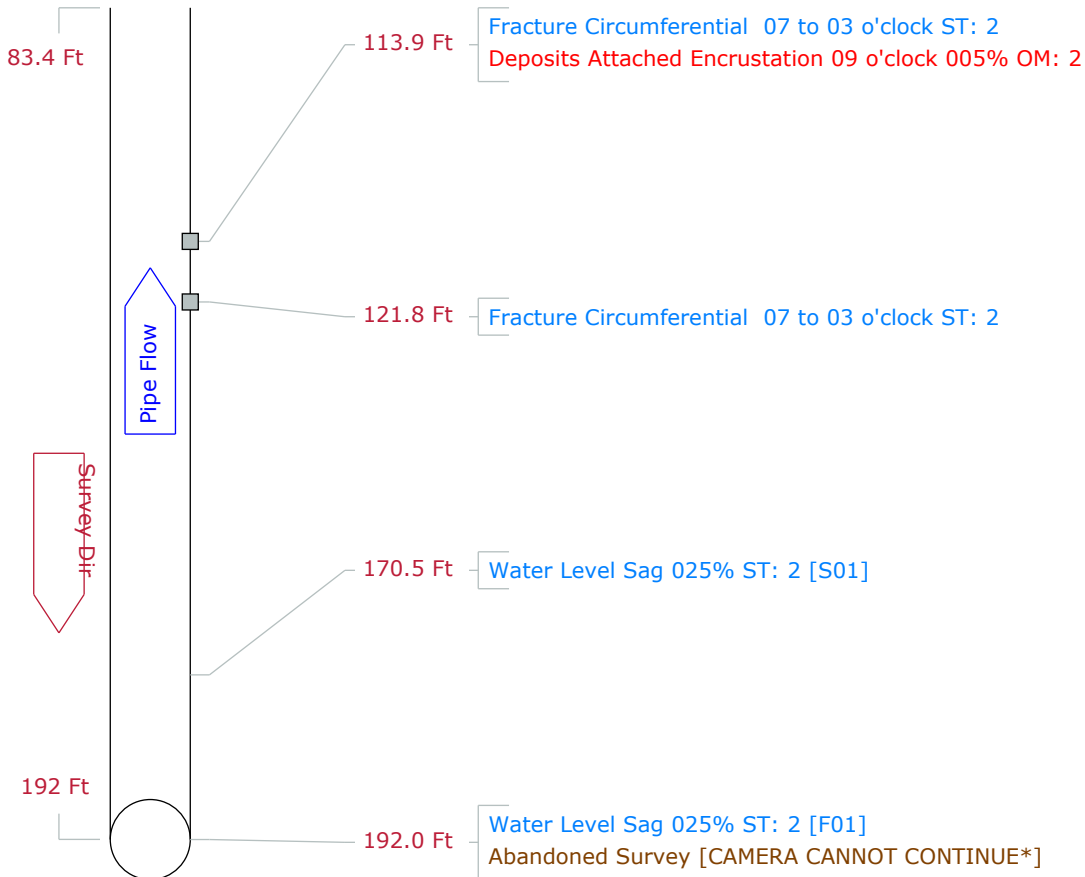
Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	10:26	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 45S	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 49S	Rim to invert 11.30		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	Ft	Length Surveyed	192.00 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Elevation	
Coordinate System						GPS Accuracy	



Great Lakes TV Seal, Inc.
 Phone: 920-863-3663
 Address: 3600 Kewaunee Rd., Green Bay, WI
 Fax: 920-863-3662

Pipe Graphic Report of PSR MH 45S X for Ruekert & Mielke, Inc.

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/15	Time	10:26	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S		Rim to invert		Grade to invert	Rim to grade	Ft
Down	MH 49S		Rim to invert 11.30		Grade to invert	Rim to grade	Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	Ft	Length Surveyed	192.00 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment			Cat			
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Easting	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/15	Setup 5
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 27.0 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 47.jpg



Video Index Count 29.5 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 48.jpg



Video Index Count 113.9 Ft
 Code **Fracture Circumferential**
 Remarks
 File Name 49.jpg



Video Index Count 121.8 Ft
 Code **Fracture Circumferential**
 Remarks
 File Name 50.jpg



Work Order	22251STM	Survey Date	2022/07/15	Setup 5
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 45S

X

for Ruekert & Mielke, Inc.

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	10:26	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	Ft	Length Surveyed	192.0 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						De Pere 22251 STM	
Northing						Easting	
Coordinate System						GPS Accuracy	
						Work Order	
						Elevation	

Count	Video	CD Code		In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST	Start of Survey							
0.0		AMH	Manhole							MH 49S
0.0		MWL	Water Level			15				
6.3		TB	Tap Break-in	12.000				03		
13.4		TB	Tap Break-in	4.000				08		
19.1		DAE	Deposits Attached Encrustation			5	J	07 10		
27.0		OBP	Obstacle External Pipe or Cable			10		11 03	0001	
29.5		OBP	Obstacle External Pipe or Cable			10		11 03	0002	
29.5		FC	Fracture Circumferential					10 12		
29.5		DAE	Deposits Attached Encrustation			5		09 12		
29.5		IW	Infil Weeper					11		
31.0		MGO	General Observation							2X4 BOARDS AT PIPES
67.4		MGO	General Observation							POSSIBLE BURIED MH
75.2		TBC	Tap Break-in Capped	6.000				09		
83.4		TB	Tap Break-in	8.000				03		
113.9		FC	Fracture Circumferential					07 03	0003	
113.9		DAE	Deposits Attached Encrustation			5		09		
121.8		FC	Fracture Circumferential					07 03	0004	
170.5		S01	MWLS Water Level Sag			25				
192.0		F01	MWLS Water Level Sag			25				
192.0		MSA	Abandoned Survey							CAMERA CANNOT CONTINUE*

192.0 Ft Total Length Surveyed



Tabular Report of PSR MH 45S X for Ruekert & Mielke, Inc.

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/15	Time	10:26	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S		Rim to invert		Grade to invert	Rim to grade	Ft
Down	MH 49S		Rim to invert 11.30		Grade to invert	Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length		Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment		Cat			Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251 STM					Work Order	
Northing			Easting			Elevation	
Coordinate System						GPS Accuracy	

Notes	Scores	Structural: Pipe Rating 12	Pipe Ratings Index 2	Quick Rating 2600
		O&M: Pipe Rating 10	Pipe Ratings Index 2	Quick Rating 2500
		Overall Pipe Rating 22	Pipe Ratings Index 4	Quick Rating 2A00

Note: Manhole numbers on screen are incorrect / Screen should read MH 49S to MH 45S

MH 49S

Precast construction / Good condition
Has storm cover

MH 45S

Refaced construction
No steps
No Cretex seal
Open pick hole

*Note: At 192.0' camera tipped over due to an unknow obstruction under water / Water level was rising due to rain
Will retelevise after rain stops / See setup 6

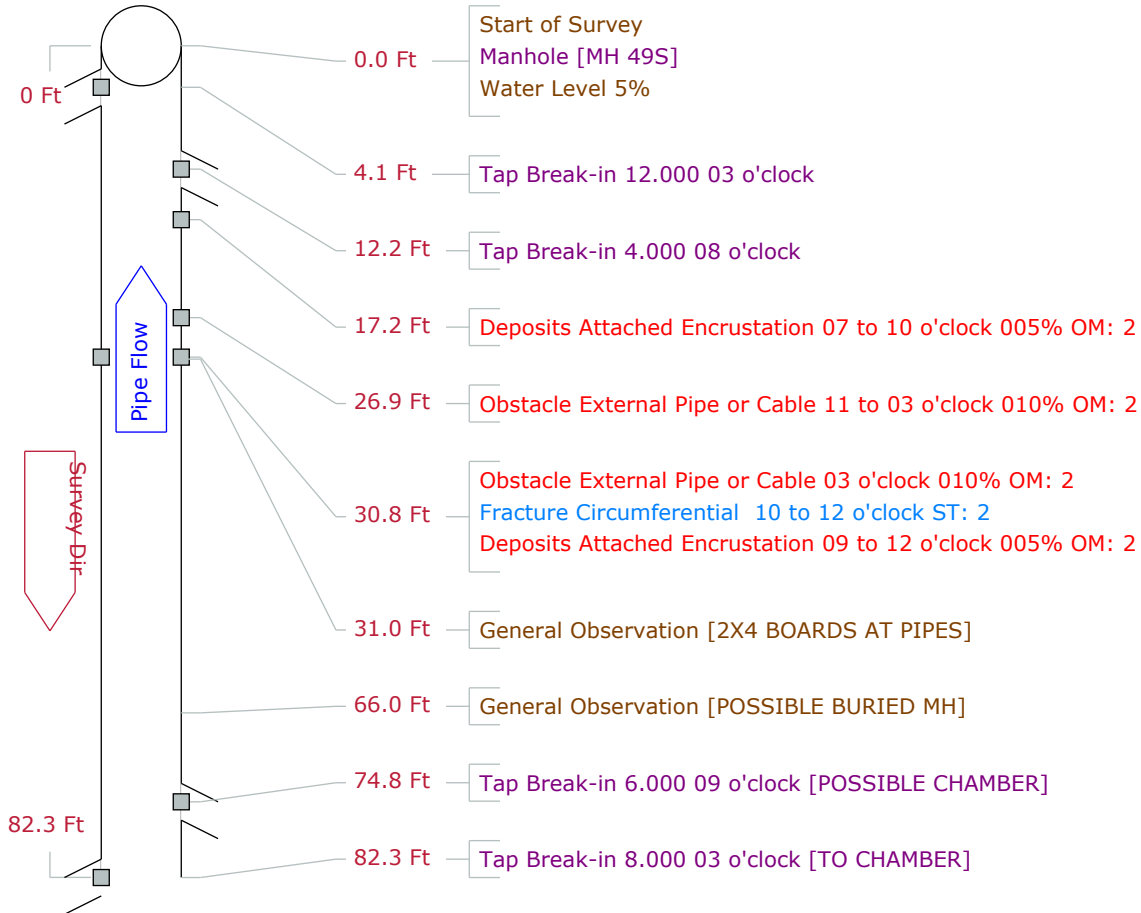
CD column indicates continuous defects:

S indicates start of defect
F indicates finish of defect



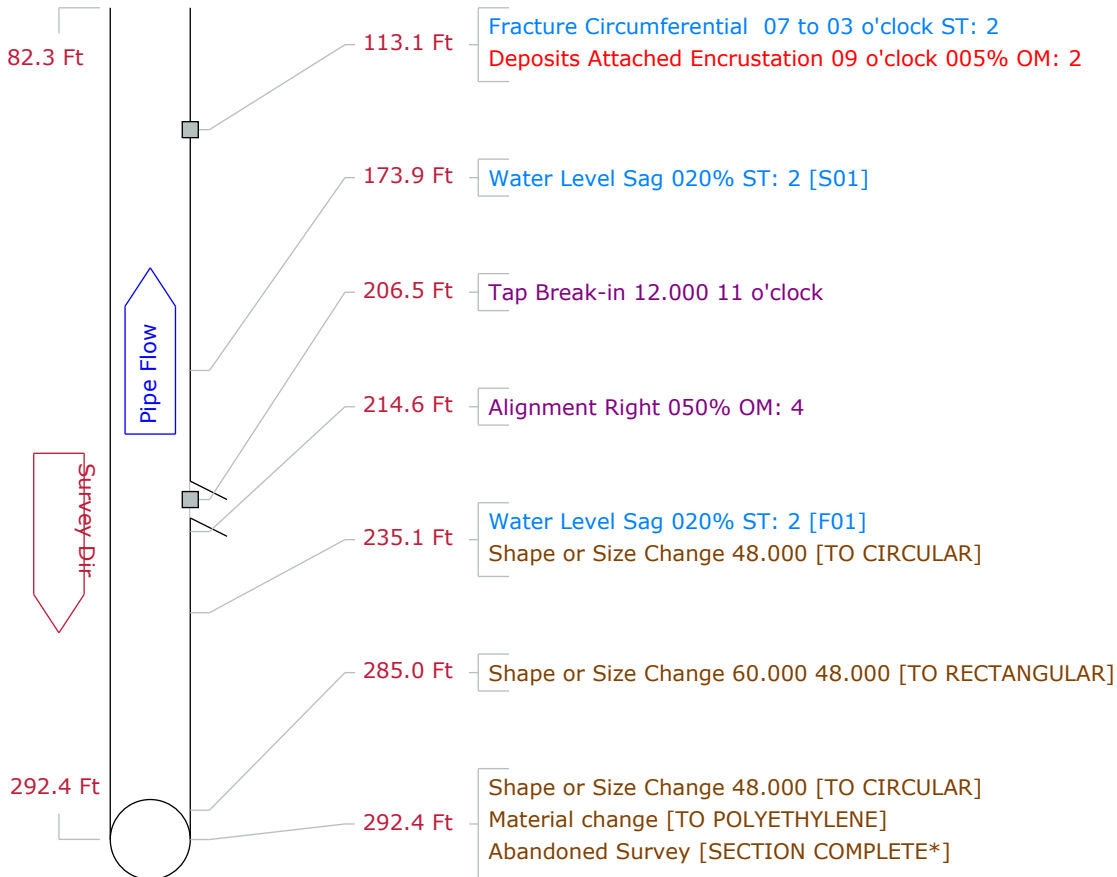
Pipe Graphic Report of PSR MH 45S Y for Ruekert & Mielke, Inc.

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere	
Drainage	Survey Customer Ruekert & Mielke, Inc.							
P/O #		Date	2022/07/18	Time	10:35	Street Box Sewer Storm Lines		
City	De Pere	Further location details						
Up	MH 45S	Rim to invert		Grade to invert		Rim to grade	Ft	
Down	MH 49S	Rim to invert 11.30		Grade to invert		Rim to grade	Ft	
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM	
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N	
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	Ft	Length Surveyed	292.40 Ft	
Lining		Year laid		Year rehabilitated		Weather	Light Rain	
Purpose	Routine Assessment	Cat						
Additional info	Retelevising after rain stopped					Structural	O & M	
Location	Light Highway						Miscellaneous	Hydraulic
Project	De Pere 22251 STM						Work Order	
Northing		Easting					Elevation	
Coordinate System							GPS Accuracy	



Pipe Graphic Report of PSR MH 45S Y for Ruekert & Mielke, Inc.

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/18	Time	10:35	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S		Rim to invert		Grade to invert		Rim to grade Ft
Down	MH 49S		Rim to invert 11.30		Grade to invert		Rim to grade Ft
Use	Stormwater	Direction	Upstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	Ft	Length Surveyed	292.40 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info	Retelevising after rain stopped					Structural	O & M
Location	Light Highway					Miscellaneous	Hydraulic
Project	De Pere 22251 STM					Work Order	
Northing	Easting					Elevation	
Coordinate System						GPS Accuracy	



Work Order	22251STM	Survey Date	2022/07/18	Setup 6
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 26.9 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 51.jpg



Video Index Count 30.8 Ft
 Code **Obstacle External Pipe or Cable**
 Remarks
 File Name 52.jpg



Video Index Count 31.0 Ft
 Code **General Observation**
 Remarks 2X4 BOARDS AT PIPES
 File Name 54.jpg



Video Index Count 113.1 Ft
 Code **Fracture Circumferential**
 Remarks
 File Name 55.jpg



Work Order	22251STM	Survey Date	2022/07/18	Setup 6
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 45S

Y

for Ruekert & Mielke, Inc.

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/18	Time	10:35	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length	Ft	Length Surveyed
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info	Retelevising after rain stopped					Structural	O & M
Location	Light Highway					Miscellaneous	Constructional
Project	De Pere 22251 STM					Work Order	
Northing						Easting	
Coordinate System						GPS Accuracy	

Count	Video	CD Code		In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 49S
0.0			MWL Water Level			5				
4.1			TB Tap Break-in	12.000				03		
12.2			TB Tap Break-in	4.000				08		
17.2			DAE Deposits Attached Encrustation			5	J	07 10		
26.9			OBP Obstacle External Pipe or Cable			10		11 03	0001	
30.8			OBP Obstacle External Pipe or Cable			10		03	0002	
30.8			FC Fracture Circumferential					10 12		
30.8			DAE Deposits Attached Encrustation			5		09 12		
31.0			MGO General Observation						0003	2X4 BOARDS AT PIPES
66.0			MGO General Observation							POSSIBLE BURIED MH
74.8			TB Tap Break-in	6.000				09		POSSIBLE CHAMBER
82.3			TB Tap Break-in	8.000				03		TO CHAMBER
113.1			FC Fracture Circumferential					07 03	0004	
113.1			DAE Deposits Attached Encrustation			5		09		
173.9		S01	MWLS Water Level Sag			20				
206.5			TB Tap Break-in	12.000				11		
214.6			LR Alignment Right			50				
235.1		F01	MWLS Water Level Sag			20				
235.1			MSC Shape or Size Change	48.000						TO CIRCULAR
285.0			MSC Shape or Size Change	60.000	48.000					TO RECTANGULAR
292.4			MSC Shape or Size Change	48.000						TO CIRCULAR
292.4			MMC Material change							TO POLYETHYLENE
292.4			MSA Abandoned Survey							SECTION COMPLETE*

292.4 Ft Total Length Surveyed



Tabular Report of PSR MH 45S Y for Ruekert & Mielke, Inc.

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/18	Time	10:35	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 45S	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 49S	Rim to invert	11.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Up	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length		Ft	Total length		Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info	Retelevising after rain stopped				Structural	O & M	Constructional
Location	Light Highway			Miscellaneous			
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			

Notes	Scores	Structural: Pipe Rating 28	Pipe Ratings Index 2	Quick Rating 2A00
		O&M: Pipe Rating 14	Pipe Ratings Index 2.3	Quick Rating 4125
		Overall Pipe Rating 42	Pipe Ratings Index 4.3	Quick Rating 412B

Note: Manhole numbers on screen are incorrect / Screen should read MH 49S to MH 45S

MH 49S

Precast construction / Good condition
Has storm cover

MH 45S

Refaced construction
No steps
No Cretex seal
Open pick hole

*Note: At 292.4' camera cannot continue into smaller pipe
MH 46S does not exist / This completes setup 2

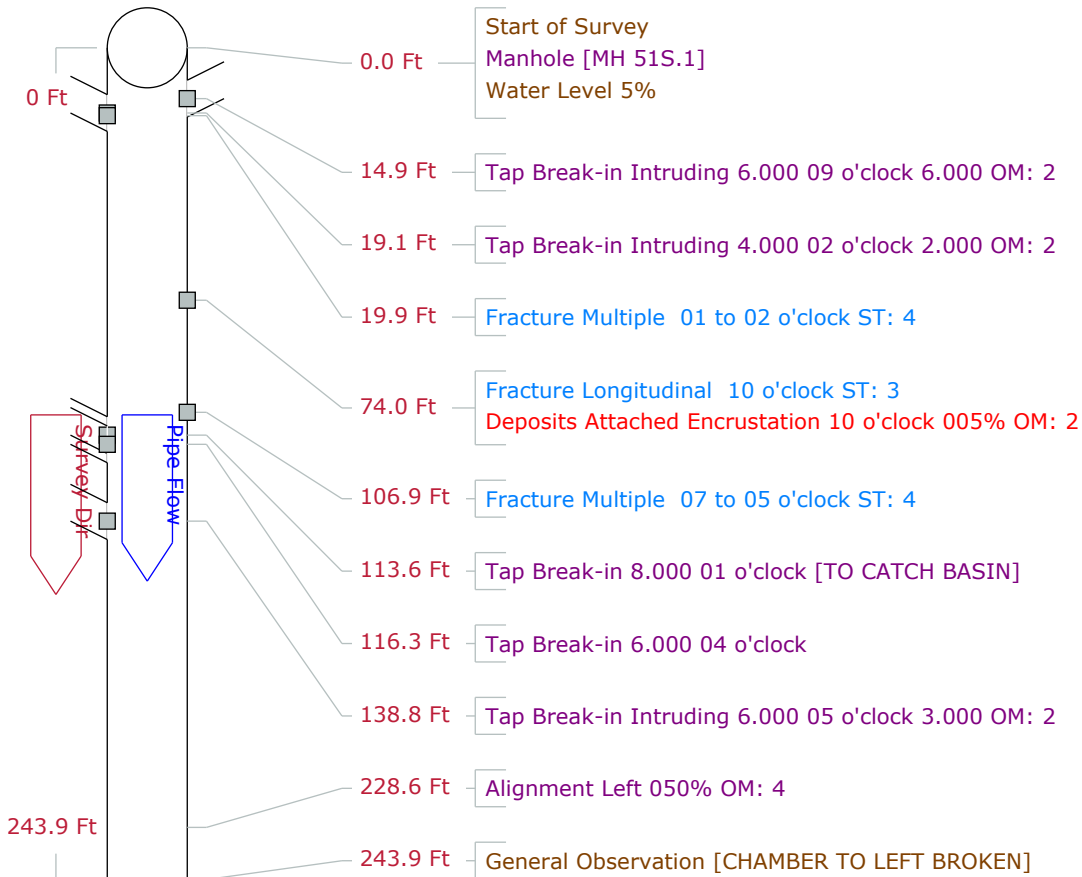
CD column indicates continuous defects:

S indicates start of defect
F indicates finish of defect



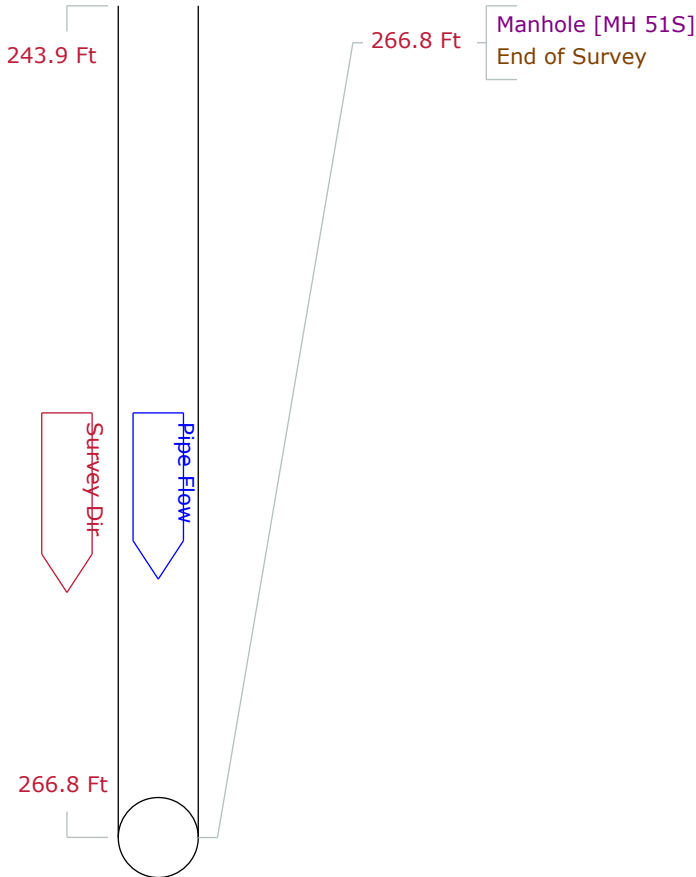
Pipe Graphic Report of PSR MH 51S.1 X for Ruekert & Mielke, Inc.

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/18	Time	11:25	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 51S.1	Rim to invert	5.90	Grade to invert		Rim to grade	Ft
Down	MH 51S	Rim to invert	14.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	266.8 Ft	Length Surveyed	266.80 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic	Constructional	
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Pipe Graphic Report of PSR MH 51S.1 X for Ruekert & Mielke, Inc.

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/18	Time	11:25	Street Box Sewer Storm Lines	
City	De Pere	Further location details					
Up	MH 51S.1	Rim to invert	5.90	Grade to invert		Rim to grade	Ft
Down	MH 51S	Rim to invert	14.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	266.8 Ft	Length Surveyed	266.80 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project						Work Order	
Northing						Elevation	
Coordinate System						GPS Accuracy	



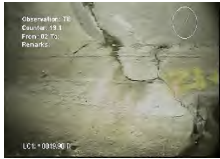
Work Order	22251STM	Survey Date	2022/07/18	Setup 7
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 14.9 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 56.jpg



Video Index Count 19.1 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 57.jpg



Video Index Count 19.9 Ft
 Code Fracture Multiple
 Remarks
 File Name 58.jpg



Video Index Count 74.0 Ft
 Code Fracture Longitudinal
 Remarks
 File Name 59.jpg



Video Index Count 106.9 Ft
 Code Fracture Multiple
 Remarks
 File Name 60.jpg



Video Index Count 138.8 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 61.jpg



Video Index Count 243.9 Ft
 Code General Observation
 Remarks CHAMBER TO LEFT BROKEN
 File Name 83.jpg



Work Order	22251STM	Survey Date	2022/07/18	Setup 7
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 51S.1 X for Ruekert & Mielke, Inc.

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/18	Time	11:25	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 51S.1	Rim to invert	5.90	Grade to invert		Rim to grade	Ft
Down	MH 51S	Rim to invert	14.30	Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Down	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	266.8 Ft	Length Surveyed	266.8 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251 STM	Work Order					
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 51S.1
0.0			MWL Water Level			5				
14.9			TBI Tap Break-in Intruding	6.000	6.000		09		0001	
19.1			TBI Tap Break-in Intruding	4.000	2.000		02		0002	
19.9			FM Fracture Multiple				01 02		0003	
74.0			FL Fracture Longitudinal				10		0004	
74.0			DAE Deposits Attached Encrustation			5	10			
106.9			FM Fracture Multiple				07 05		0005	
113.6			TB Tap Break-in	8.000			01			TO CATCH BASIN
116.3			TB Tap Break-in	6.000			04			
138.8			TBI Tap Break-in Intruding	6.000	3.000		05		0006	
228.6			LL Alignment Left			50				
243.9			MGO General Observation						0007	CHAMBER TO LEFT BROKEN
266.8			AMH Manhole							MH 51S
266.8			FH End of Survey							

266.8 Ft Total Length Surveyed

Notes	Scores	Structural:	Pipe Rating 11	Pipe Ratings Index 3.7	Quick Rating 4231
		O&M:	Pipe Rating 12	Pipe Ratings Index 2.4	Quick Rating 4124
		Overall	Pipe Rating 23	Pipe Ratings Index 6.1	Quick Rating 4331

MH 51S.1 (MH behind church)

Casting set on top pipe
Has storm cover

MH 51S

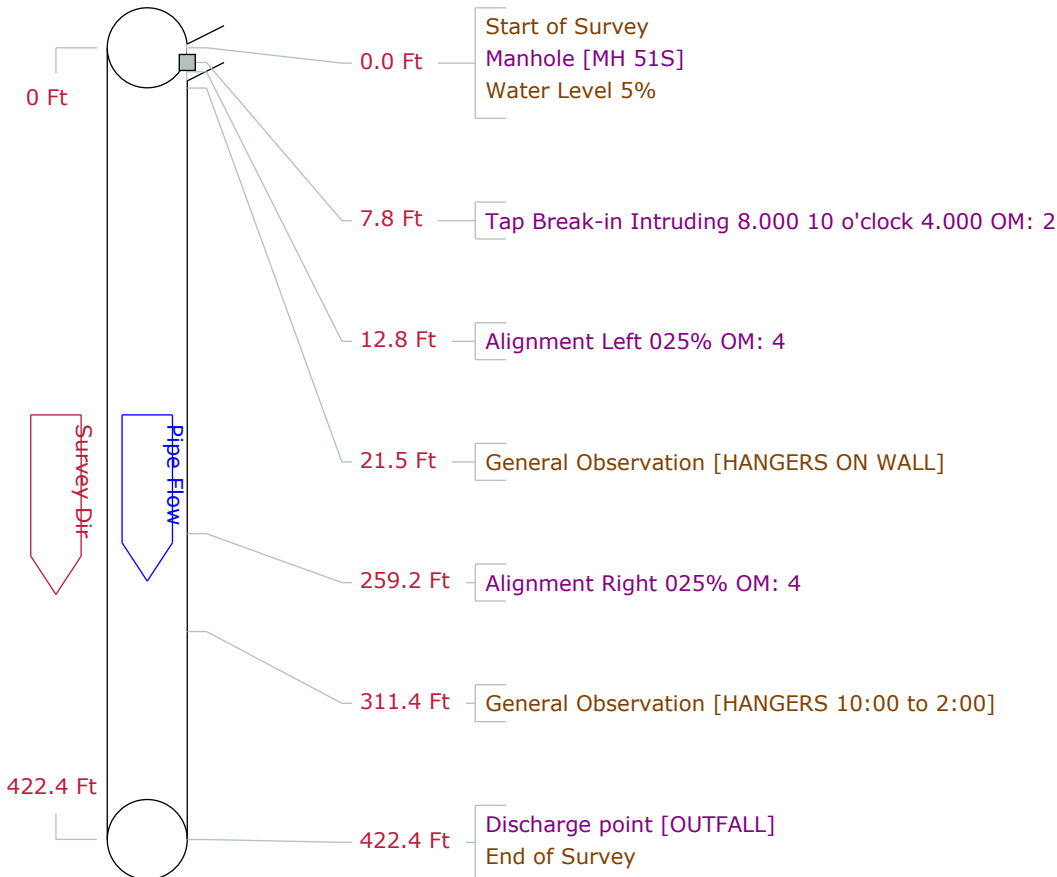
Precast construction / Good condition
Open pick hole

Section measures 267'



Pipe Graphic Report of PSR MH 51S X for Ruekert & Mielke, Inc.

Setup	8	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke, Inc.						
P/O #		Date	2022/07/18	Time	11:40	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 51S	Rim to invert	14.30	Grade to invert		Rim to grade	Ft
Down	OUTFALL	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Downstream	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	422.4 Ft	Length Surveyed	422.40 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location	Light Highway			Miscellaneous	Hydraulic	Constructional	
Project	De Pere 22251 STM			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Work Order	22251STM	Survey Date	2022/07/18	Setup 8
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Video Index Count 7.8 Ft
 Code Tap Break-in Intruding
 Remarks
 File Name 62.jpg



Video Index Count 21.5 Ft
 Code General Observation
 Remarks HANGERS ON WALL
 File Name 64.jpg



Video Index Count 311.4 Ft
 Code General Observation
 Remarks HANGERS 10:00 to 2:00
 File Name 65.jpg



Work Order	22251STM	Survey Date	2022/07/18	Setup 8
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\REUKERT MIELKE DE PERE 22251STM\			
Path to video files	Q:\2022 PIPELOGIX\Movies\REUKERT MIELKE DE PERE 22251STM\			
Path to media files	Q:\2022 PIPELOGIX\Media\REUKERT MIELKE DE PERE 22251STM\			



Tabular Report of PSR MH 51S X for Ruekert & Mielke, Inc.

Setup	8	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke, Inc.				
P/O #		Date	2022/07/18	Time	11:40	Street	Box Sewer Storm Lines
City	De Pere	Further location details					
Up	MH 51S	Rim to invert	14.30	Grade to invert		Rim to grade	Ft
Down	OUTFALL	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Stormwater	Direction	Down	Flow control		Media No	22251STM
Shape	Rectangular	Height	60	Width	84 ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	Ft	Total length	422.4 Ft	Length Surveyed	422.4 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project						Work Order	
Northing						Easting	
Coordinate System						Elevation	
						GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 51S
0.0			MWL Water Level			5				
7.8			TBI Tap Break-in Intruding	8.000	4.000		10		0001	
12.8			LL Alignment Left			25				
21.5			MGO General Observation						0002	HANGERS ON WALL
259.2			LR Alignment Right			25				
311.4			MGO General Observation						0003	HANGERS 10:00 to 2:00
422.4			ADP Discharge point							OUTFALL
422.4			FH End of Survey							

422.4 Ft Total Length Surveyed

Notes	Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
		O&M:	Pipe Rating 10	Pipe Ratings Index 3.3	Quick Rating 4221
		Overall	Pipe Rating 10	Pipe Ratings Index 3.3	Quick Rating 4221

MH 51S

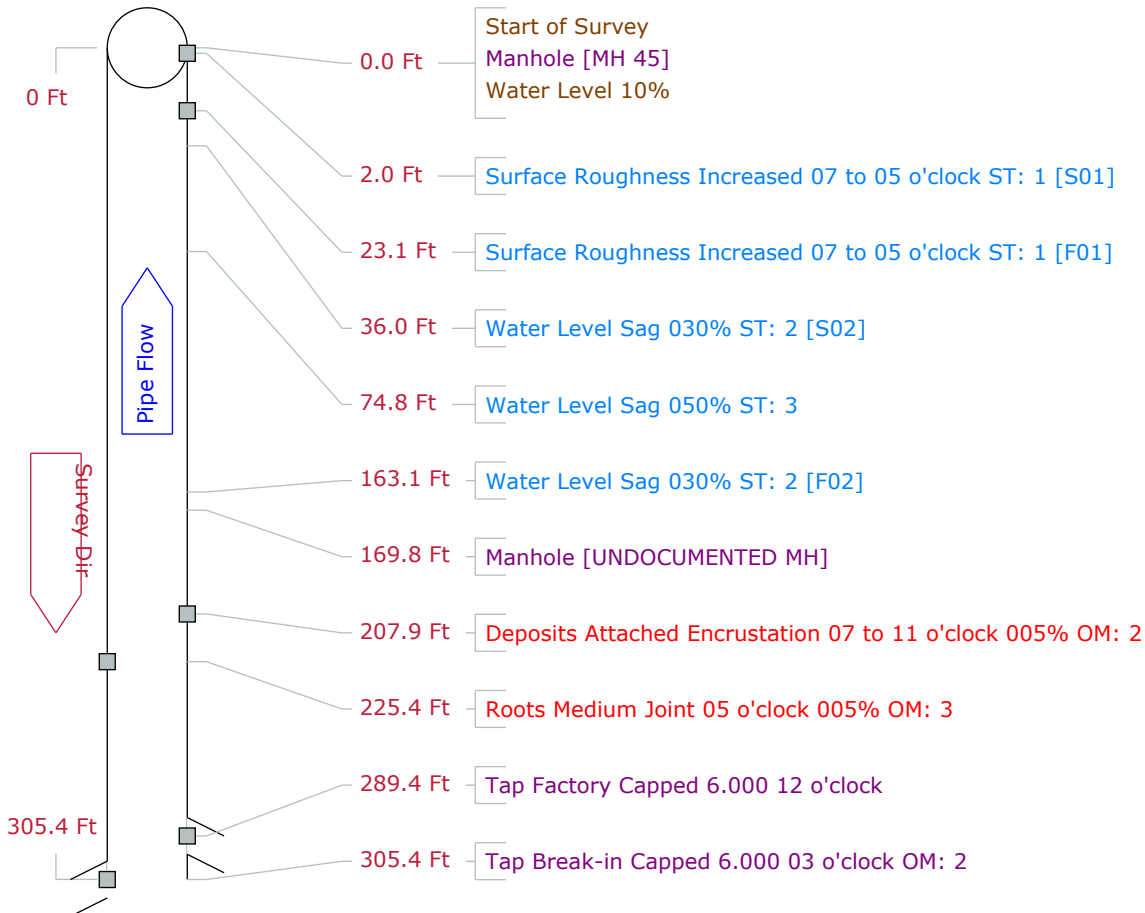
Precast construction / Good condition

Open pick hole



Pipe Graphic Report of PSR 45.1 X for Ruekert & Mielke

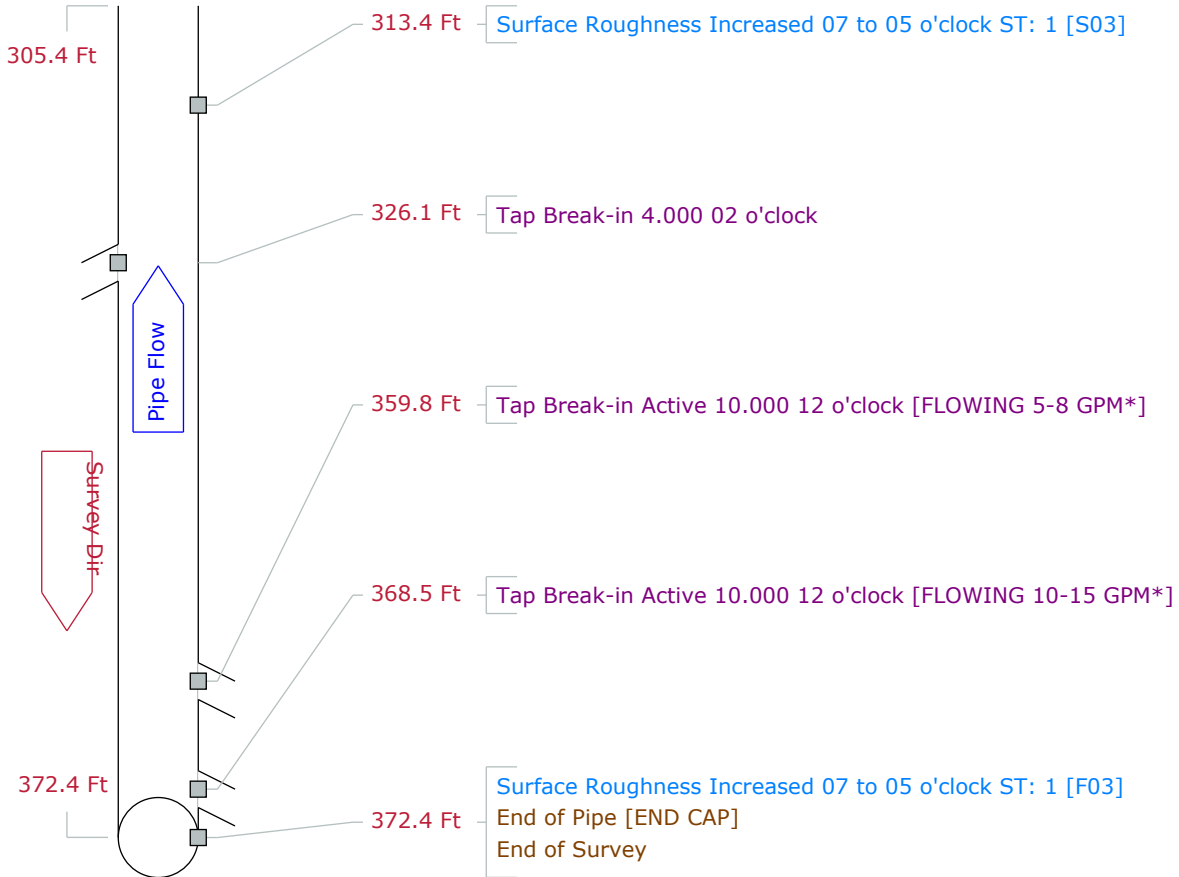
Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/15	Time	12:51	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 45.1	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 45	Rim to invert 7.40		Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Upstream	Flow control		Media No 22251SAN	
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length		372.4 Ft	Length Surveyed 372.40 Ft
Lining		Year laid		Year rehabilitated		Weather Light Rain	
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN					Work Order	
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Great Lakes TV Seal, Inc.
 Phone: 920-863-3663
 Address: 3600 Kewaunee Rd., Green Bay, WI
 Fax: 920-863-3662

Pipe Graphic Report of PSR 45.1 X for Ruekert & Mielke

Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/15	Time	12:51	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 45.1		Rim to invert		Grade to invert	Rim to grade	Ft
Down	MH 45		Rim to invert 7.40		Grade to invert	Rim to grade	Ft
Use	Sanitary	Direction	Upstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	372.4 Ft	Length Surveyed	372.40 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment			Cat			
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Great Lakes TV Seal, Inc.
 Phone: 920-863-3663
 Address: 3600 Kewaunee Rd., Green Bay, WI
 Fax: 920-863-3662

Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	12:51	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 45.1	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 45	Rim to invert	7.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Up	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	372.4 Ft	Length Surveyed	372.4 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN	Work Order					
Northing		Easting					Elevation
Coordinate System						GPS Accuracy	

Count	Video	CD Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST							Start of Survey
0.0		AMH							Manhole
0.0		MWL			10				Water Level
2.0		S01				07	05		Surface Roughness Increased
23.1		F01				07	05		Surface Roughness Increased
36.0		S02			30				MWLS Water Level Sag
74.8					50				MWLS Water Level Sag
163.1		F02			30				MWLS Water Level Sag
169.8		AMH							Manhole
207.9		DAE			5	J	07	11	Deposits Attached Encrustation
225.4		RMJ			5	J	05		Roots Medium Joint
289.4		TFC	6.000				12		Tap Factory Capped
305.4		TBC	6.000				03		Tap Break-in Capped
313.4		S03				07	05		Surface Roughness Increased
326.1		TB	4.000				02		Tap Break-in
359.8		TBA	10.000				12		Tap Break-in Active
368.5		TBA	10.000				12		Tap Break-in Active
372.4		F03				07	05		Surface Roughness Increased
372.4		AEP							End of Pipe
372.4		FH							End of Survey

372.4 Ft Total Length Surveyed



Setup	1	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	12:51	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 45.1	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 45	Rim to invert	7.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Up	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	372.4 Ft	Length Surveyed	372.4 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info				Structural O & M Constructional Miscellaneous			
Location							
Project	De Pere 22251SAN			Work Order			
Northing				Easting			
Coordinate System				GPS Accuracy			

Scores

Structural:	Pipe Rating 69	Pipe Ratings Index 1.6	Quick Rating 312D
O&M:	Pipe Rating 7	Pipe Ratings Index 2.3	Quick Rating 3122
Overall	Pipe Rating 76	Pipe Ratings Index 3.9	Quick Rating 322D

Notes

MH 45
 Poured construction
 Steps rusting out
 No Cretex seal
 Open pick hole

MH 45.1 (MH at Grant St.)
 Manhole does not exist

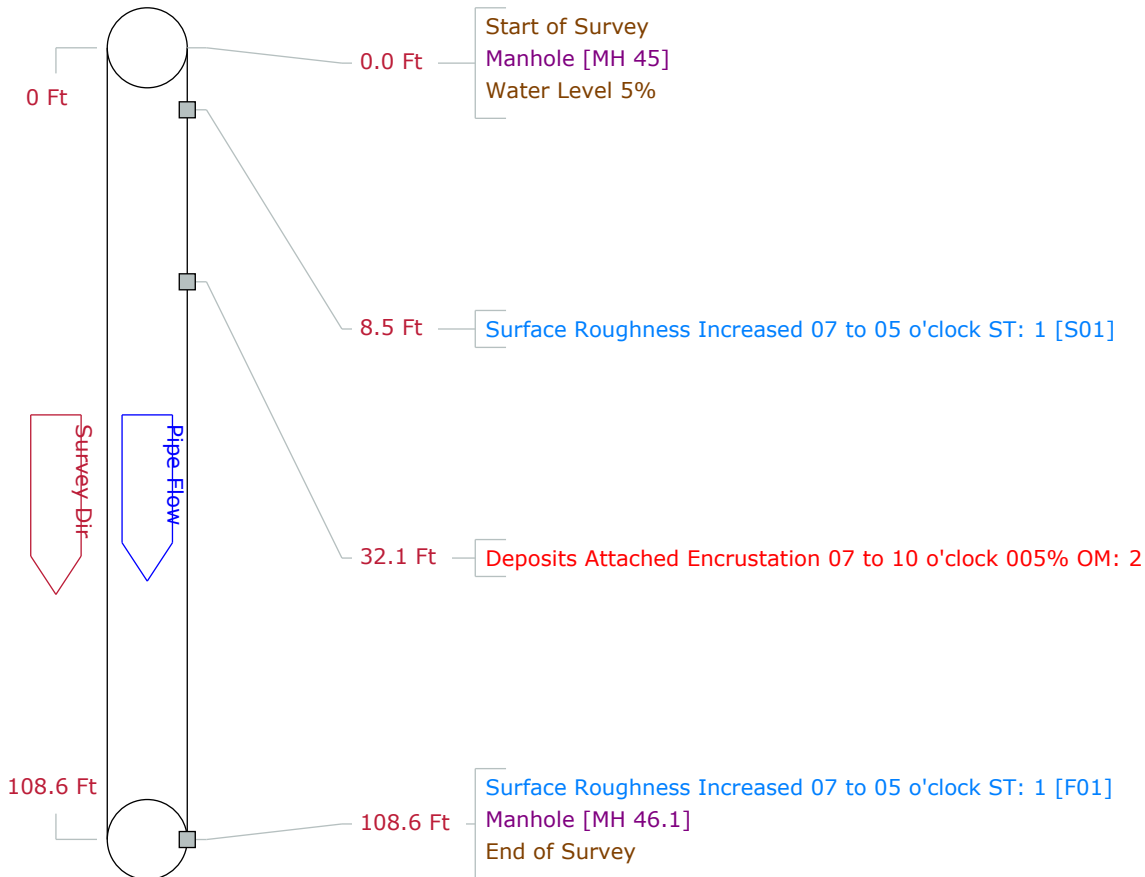
*Note: Laterals at 359.8' and 368.5' / Possibly main line connections from Grant St.

CD column indicates continuous defects:
 S indicates start of defect
 F indicates finish of defect



Pipe Graphic Report of PSR 45 X for Ruekert & Mielke

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/15	Time	14:04	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 45	Rim to invert	7.40	Grade to invert		Rim to grade	Ft
Down	MH 46.1	Rim to invert	5.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	108.6 Ft	Length Surveyed	108.60 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Tabular Report of PSR 45 X for Ruekert & Mielke

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	14:04	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 45	Rim to invert	7.40	Grade to invert		Rim to grade	Ft
Down	MH 46.1	Rim to invert	5.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	108.6 Ft	Length Surveyed	108.6 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN					Work Order	
Northing		Easting		Elevation			
Coordinate System						GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 45
0.0			MWL Water Level			5				
8.5		S01	SRI Surface Roughness Increased					07	05	
32.1			DAE Deposits Attached Encrustation			5	J	07	10	
108.6		F01	SRI Surface Roughness Increased					07	05	
108.6			AMH Manhole							MH 46.1
108.6			FH End of Survey							

108.6 Ft Total Length Surveyed



Tabular Report of PSR 45 X for Ruekert & Mielke

Setup	2	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	14:04	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 45	Rim to invert	7.40	Grade to invert		Rim to grade	Ft
Down	MH 46.1	Rim to invert	5.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	108.6 Ft	Length Surveyed	108.6 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info				Structural O & M Constructional Miscellaneous			
Location							
Project	De Pere 22251SAN			Work Order			
Northing				Easting			
Coordinate System				Elevation			
				GPS Accuracy			

Notes	Scores	Structural: Pipe Rating 20	Pipe Ratings Index 1	Quick Rating 1C00
		O&M: Pipe Rating 2	Pipe Ratings Index 2	Quick Rating 2100
		Overall Pipe Rating 22	Pipe Ratings Index 3	Quick Rating 211C

Note: Manhole numbers on screen are incorrect / Screen should read MH 45 to MH 46.1

MH 45
 Poured construction
 Steps rusting out
 No Cretex seal
 Open pick hole

MH 46.1 (Undocumented MH)
 Precast construction / Good condition
 No Cretex seal

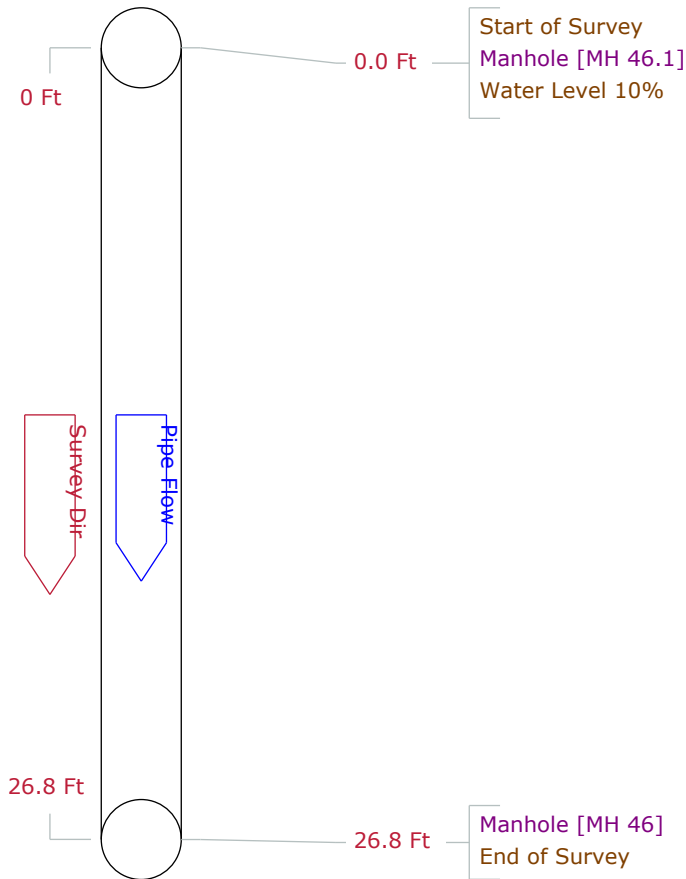
Section measures 108'

CD column indicates continuous defects:
 S indicates start of defect
 F indicates finish of defect



Pipe Graphic Report of PSR 46.1 X for Ruekert & Mielke

Setup	3	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/15	Time	14:35	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 46.1	Rim to invert	5.70	Grade to invert		Rim to grade	Ft
Down	MH 46	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	26.8 Ft	Length Surveyed	26.80 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Tabular Report of PSR 46.1

X

for Ruekert & Mielke

Setup	3	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	14:35	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 46.1	Rim to invert	5.70	Grade to invert		Rim to grade	Ft
Down	MH 46	Rim to invert		Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	26.8	Length Surveyed	26.8
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN	Work Order					
Northing		Easting					Elevation
Coordinate System						GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 46.1
0.0			MWL Water Level			10				
26.8			AMH Manhole							MH 46
26.8			FH End of Survey							

26.8 Ft Total Length Surveyed

Notes	Scores	Structural: Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
		O&M: Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
		Overall Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000

Note: Manhole numbers on screen are incorrect / Screen should read MH 46.1 to MH 46

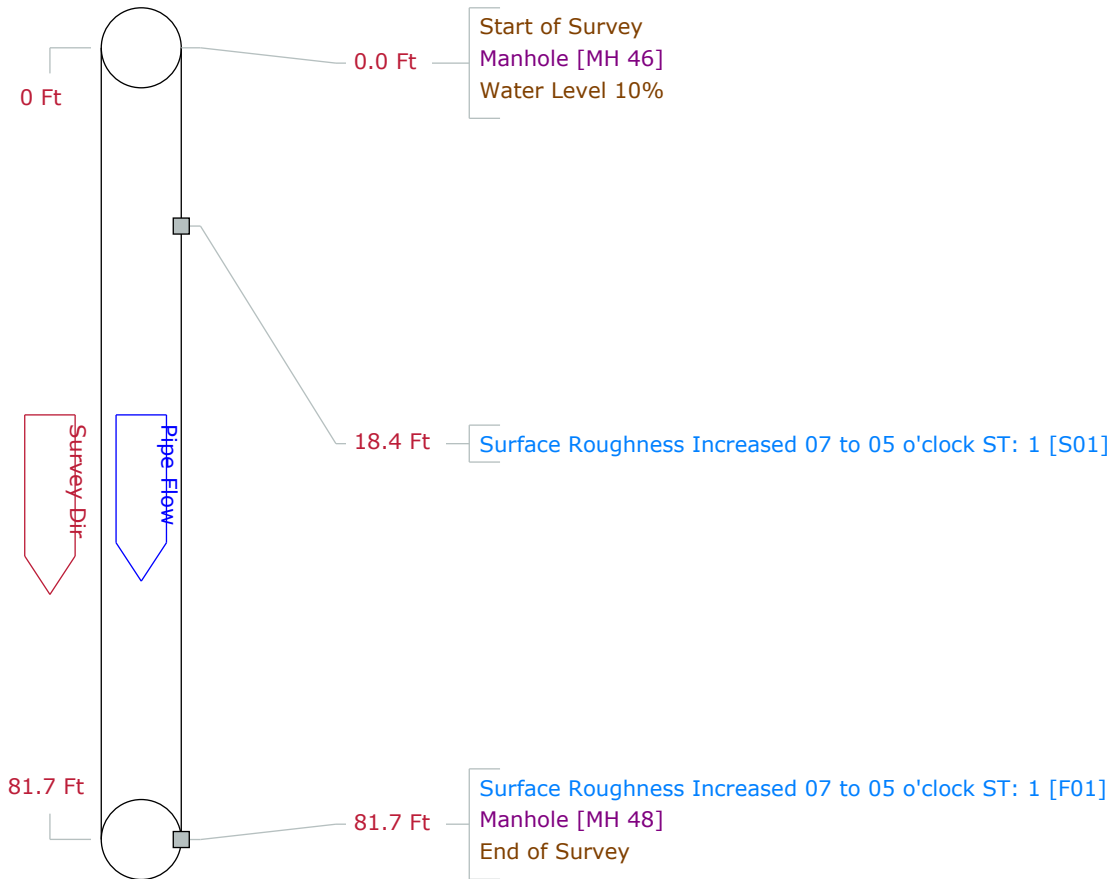
MH 46.1 (Undocumented MH)
 Precast construction / Good condition
 No Cretex seal

MH 46
 Buried MH



Pipe Graphic Report of PSR MH 46 X for Ruekert & Mielke

Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/15	Time	14:38	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 46	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 48	Rim to invert 21.20		Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control	Media No 22251SAN		
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	81.7 Ft	Length Surveyed	81.70 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Tabular Report of PSR MH 46 X for Ruekert & Mielke

Setup	4	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/15	Time	14:38	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 46	Rim to invert		Grade to invert		Rim to grade	Ft
Down	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	81.7	Length Surveyed	81.7
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN					Work Order	
Northing		Easting		Elevation			
Coordinate System						GPS Accuracy	

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 46
0.0			MWL Water Level			10				
18.4		S01	SRI Surface Roughness Increased				07	05		
81.7		F01	SRI Surface Roughness Increased				07	05		
81.7			AMH Manhole							MH 48
81.7			FH End of Survey							

81.7 Ft Total Length Surveyed

Notes	Scores	Structural: Pipe Rating 13	Pipe Ratings Index 1	Quick Rating 1A00
		O&M: Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
		Overall Pipe Rating 13	Pipe Ratings Index 1	Quick Rating 1A00

Note: Manhole numbers on screen are incorrect / Screen should read MH 46 to MH 48 / MH 47 does not exist as shown on map

MH 46
Buried MH

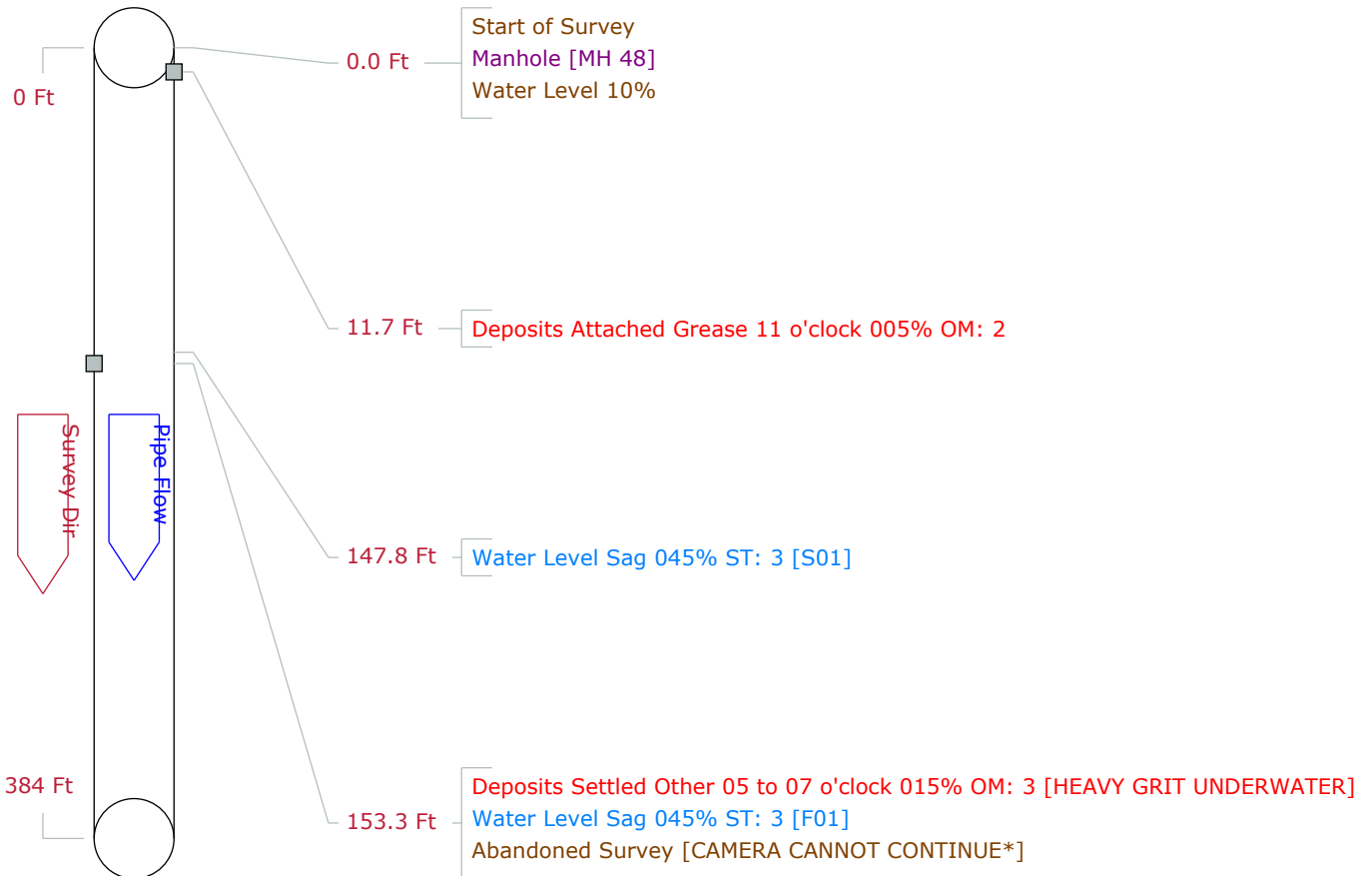
MH 48
Top 16' refaced / Bottom poured construction
Gasket missing from cover
No Cretex seal

CD column indicates continuous defects:
S indicates start of defect
F indicates finish of defect



Pipe Graphic Report of PSR MH 48 X for Ruekert & Mielke

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/18	Time	7:29	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	384.0 Ft	Length Surveyed	153.30 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting				Elevation	
Coordinate System						GPS Accuracy	



Work Order	22251SAN	Survey Date	2022/07/18	Setup 5
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Video Index Count 11.7 Ft
Code Deposits Attached Grease
Remarks
File Name 21.jpg



Work Order	22251SAN	Survey Date	2022/07/18	Setup 5
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Tabular Report of PSR MH 48 X for Ruekert & Mielke

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/18	Time	7:29	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	384.0 Ft	Length Surveyed	153.3 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN			Work Order			
Northing	Easting			Elevation			
Coordinate System				GPS Accuracy			

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 48
0.0			MWL Water Level			10				
11.7			DAGS Deposits Attached Grease			5	11	0001		
147.8		S01	MWLS Water Level Sag			45				
153.3			DSZ Deposits Settled Other			15	05 07			HEAVY GRIT UNDERWATER
153.3		F01	MWLS Water Level Sag			45				
153.3			MSA Abandoned Survey							CAMERA CANNOT CONTINUE*

153.3 Ft Total Length Surveyed



Tabular Report of PSR MH 48 X for Ruekert & Mielke

Setup	5	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey	Customer	Ruekert & Mielke			
P/O #		Date	2022/07/18	Time	7:29	Street	
City	De Pere	Box Sewer Sanitary Lines					
Further location details							
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	384.0 Ft	Length Surveyed	153.3 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info				Structural O & M Constructional Miscellaneous			
Location							
Project	De Pere 22251SAN			Work Order			
Northing				Easting			
Coordinate System				Elevation			
				GPS Accuracy			

Notes	Scores	Structural: Pipe Rating	3	Pipe Ratings Index	3	Quick Rating	3100
		O&M: Pipe Rating	5	Pipe Ratings Index	2.5	Quick Rating	3121
		Overall Pipe Rating	8	Pipe Ratings Index	5.5	Quick Rating	3221

MH 48
 Top 16' refaced / Bottom poured construction
 Gasket missing from cover
 No Cretex seal

MH 49.1 (MH on Main St.)
 Precast construction / Good condition
 Open pick hole

Section measures 384'

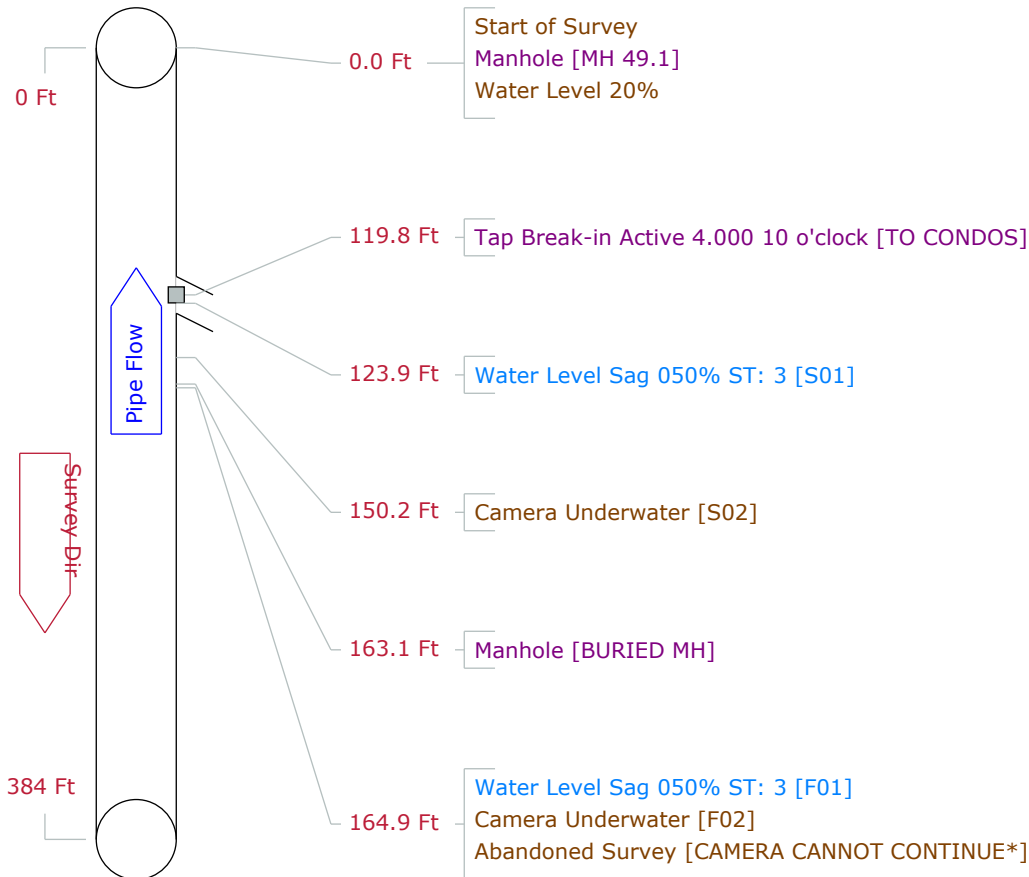
*Note: At 153.3' camera cannot continue due to heavy grit underwater / Will do a reverse setup / See setup 6

CD column indicates continuous defects:
 S indicates start of defect
 F indicates finish of defect



Pipe Graphic Report of PSR MH 48 F for Ruekert & Mielke

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/18	Time	8:56	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Upstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	384.0 Ft	Length Surveyed	164.90 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info	Reverse setup			Structural	O & M	Constructional	
Location				Miscellaneous	Hydraulic		
Project	De Pere 22251SAN			Work Order			
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			



Work Order	22251SAN	Survey Date	2022/07/18	Setup 6
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Video Index Count 163.1 Ft
Code Manhole
Remarks BURIED MH
File Name 23.jpg



Work Order	22251SAN	Survey Date	2022/07/18	Setup 6
Video				
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Tabular Report of PSR MH 48

F

for Ruekert & Mielke

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/18	Time	8:56	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Up	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	384.0 Ft	Length Surveyed	164.9 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info	Reverse setup				Structural	O & M	Constructional
Location					Miscellaneous		
Project	De Pere 22251SAN				Work Order		
Northing		Easting		Elevation			
Coordinate System					GPS Accuracy		

Count	Video	CD	Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0			ST Start of Survey							
0.0			AMH Manhole							MH 49.1
0.0			MWL Water Level			20				
119.8			TBA Tap Break-in Active	4.000			10			TO CONDOS
123.9		S01	MWLS Water Level Sag			50				
150.2		S02	MCU Camera Underwater							
163.1			AMH Manhole						0001	BURIED MH
164.9		F01	MWLS Water Level Sag			50				
164.9		F02	MCU Camera Underwater							
164.9			MSA Abandoned Survey							CAMERA CANNOT CONTINUE*

164.9 Ft Total Length Surveyed



Tabular Report of PSR MH 48 F for Ruekert & Mielke

Setup	6	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey	Customer	Ruekert & Mielke			
P/O #		Date	2022/07/18	Time	8:56	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 48	Rim to invert	21.20	Grade to invert		Rim to grade	Ft
Down	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Up	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	384.0 Ft	Length Surveyed	164.9 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info	Reverse setup					Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN					Work Order	
Northing		Easting		Elevation			
Coordinate System				GPS Accuracy			

Notes	Scores	Structural: Pipe Rating	24	Pipe Ratings Index	3	Quick Rating	3800
		O&M: Pipe Rating	12	Pipe Ratings Index	4	Quick Rating	4300
		Overall Pipe Rating	36	Pipe Ratings Index	7	Quick Rating	4338

MH 49.1 (MH on Main St.)
 Precast construction / Good condition
 Open pick hole

MH 48
 Top 16' refaced / Bottom poured construction
 Gasket missing from cover
 No Cretex seal

Section measures 384'

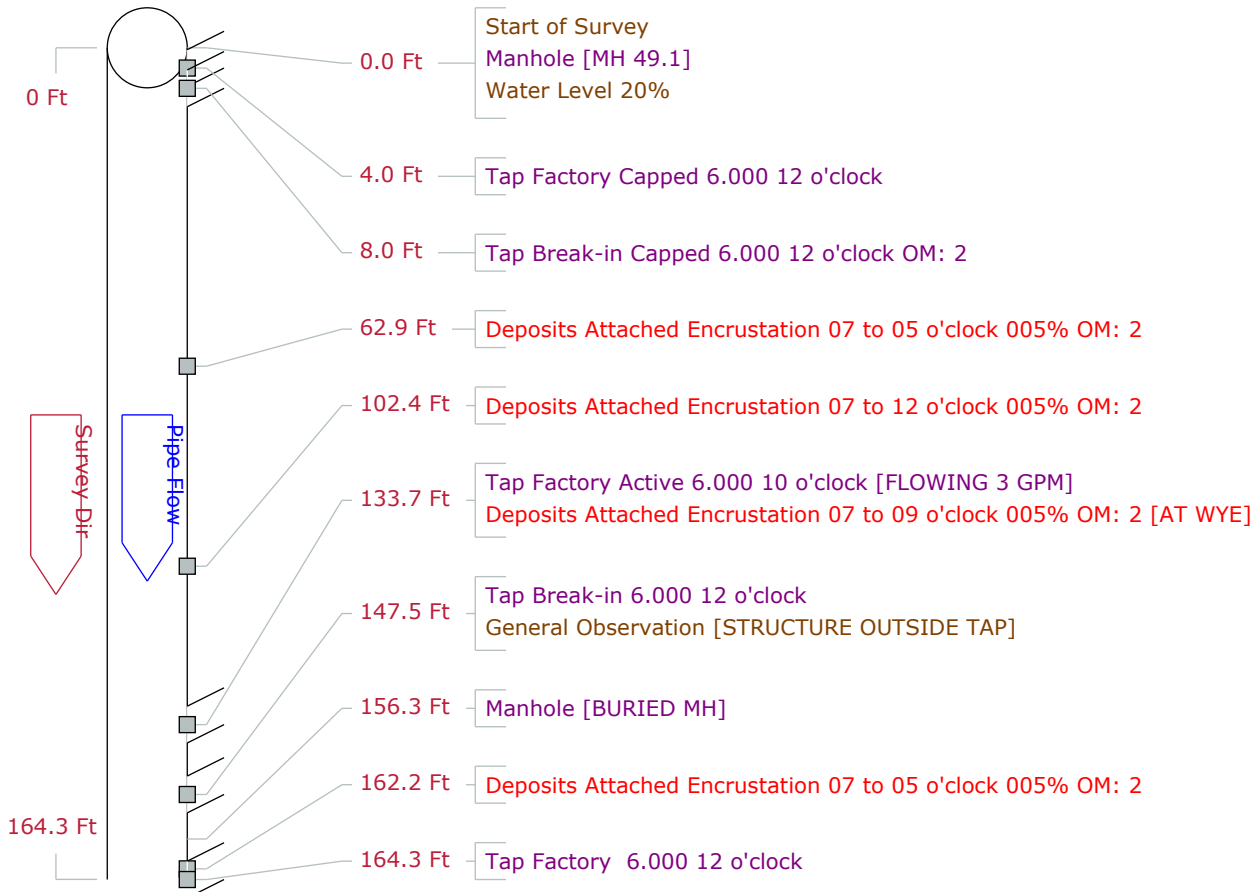
*Note: At 164.9' we will discontinue televising so camera does not become lodged in Buried MH
 Approximately 76' not televised

CD column indicates continuous defects:
 S indicates start of defect
 F indicates finish of defect



Pipe Graphic Report of PSR MH 49.1 F for Ruekert & Mielke

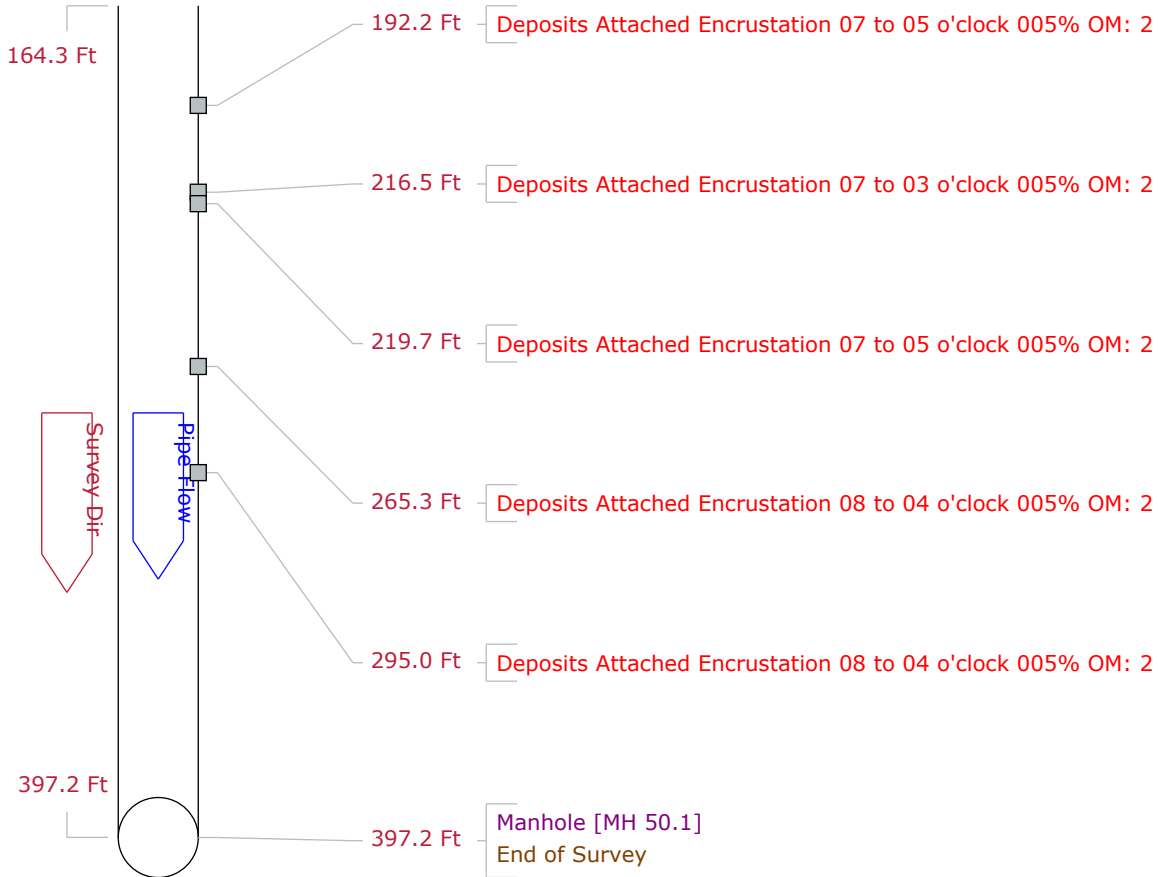
Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/18	Time	9:15	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Down	MH 50.1	Rim to invert	11.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	397.2 Ft	Length Surveyed	397.20 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info						Structural	O & M
Location						Miscellaneous	Hydraulic
Project	De Pere 22251SAN	Work Order					
Northing		Easting		Elevation			
Coordinate System		GPS Accuracy					



Great Lakes TV Seal, Inc.
 Phone: 920-863-3663
 Address: 3600 Kewaunee Rd., Green Bay, WI
 Fax: 920-863-3662

Pipe Graphic Report of PSR MH 49.1 F for Ruekert & Mielke

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage	Survey Customer Ruekert & Mielke						
P/O #		Date	2022/07/18	Time	9:15	Street Box Sewer Sanitary Lines	
City	De Pere	Further location details					
Up	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Down	MH 50.1	Rim to invert	11.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Downstream	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean N	Date Cleaned
Material	Reinforced Concrete Pipe	Joint length	3.0 Ft	Total length	397.2 Ft	Length Surveyed	397.20 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat					
Additional info				Structural O & M Constructional Miscellaneous Hydraulic			
Location				Work Order			
Project	De Pere 22251SAN	Easting		Elevation		GPS Accuracy	
Northing				Coordinate System			



CCTV Picture List of MH 49.1 F for Ruekert & Mielke

Work Order	22251SAN	Survey Date	2022/07/18	Setup 7
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Video Index Count 133.7 Ft
 Code Deposits Attached Encrustation
 Remarks AT WYE
 File Name 18.jpg



Video Index Count 147.5 Ft
 Code General Observation
 Remarks STRUCTURE OUTSIDE TAP
 File Name 19.jpg



Video Index Count 156.3 Ft
 Code Manhole
 Remarks BURIED MH
 File Name 20.jpg



Work Order	22251SAN	Survey Date	2022/07/18	Setup 7
Path to picture files	Q:\2022 PIPELOGIX\Snaps\RUEKERT MIELKE DE PERE 22251SAN\			
Path to video files	Q:\2022 PIPELOGIX\Movies\RUEKERT MIELKE DE PERE 22251SAN\			
Path to media files	Q:\2022 PIPELOGIX\Media\RUEKERT MIELKE DE PERE 22251SAN\			



Tabular Report of PSR MH 49.1

F

for Ruekert & Mielke

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/18	Time	9:15	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Down	MH 50.1	Rim to invert	11.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean N	Date Cleaned
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	397.2 Ft	Length Surveyed	397.2 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info						Structural	O & M
Location						Miscellaneous	Constructional
Project	De Pere 22251SAN	Work Order					
Northing		Easting					Elevation
Coordinate System						GPS Accuracy	

Count	Video	CD Code	In1	In2	%	JntFr	To	ImRef	Remarks
0.0		ST							Start of Survey
0.0		AMH							Manhole
0.0		MWL			20				Water Level
4.0		TFC	6.000			12			Tap Factory Capped
8.0		TBC	6.000			12			Tap Break-in Capped
62.9		DAE			5	J	07	05	Deposits Attached Encrustation
102.4		DAE			5	J	07	12	Deposits Attached Encrustation
133.7		TFA	6.000			10			Tap Factory Active
133.7		DAE			5		07	09	Deposits Attached Encrustation
147.5		TB	6.000			12			Tap Break-in
147.5		MGO						0002	General Observation
156.3		AMH						0003	Manhole
162.2		DAE			5		07	05	Deposits Attached Encrustation
164.3		TF	6.000			12			Tap Factory
192.2		DAE			5	J	07	05	Deposits Attached Encrustation
216.5		DAE			5	J	07	03	Deposits Attached Encrustation
219.7		DAE			5	J	07	05	Deposits Attached Encrustation
265.3		DAE			5	J	08	04	Deposits Attached Encrustation
295.0		DAE			5	J	08	04	Deposits Attached Encrustation
397.2		AMH							Manhole
397.2		FH							End of Survey

397.2 Ft Total Length Surveyed



Tabular Report of PSR MH 49.1 F for Ruekert & Mielke

Setup	7	Surveyor	Bill Krohn	Certificate #	U609-1885	System Owner	City of De Pere
Drainage		Survey Customer	Ruekert & Mielke				
P/O #		Date	2022/07/18	Time	9:15	Street	Box Sewer Sanitary Lines
City	De Pere	Further location details					
Up	MH 49.1	Rim to invert	14.40	Grade to invert		Rim to grade	Ft
Down	MH 50.1	Rim to invert	11.70	Grade to invert		Rim to grade	Ft
Use	Sanitary	Direction	Down	Flow control		Media No	22251SAN
Shape	Circular	Height	12	Width	ins	Preclean	N
Material	Reinforced Concrete Pipe	Joint length	3.00Ft	Total length	397.2 Ft	Length Surveyed	397.2 Ft
Lining		Year laid		Year rehabilitated		Weather	Light Rain
Purpose	Routine Assessment	Cat				Pressure	
Additional info				Structural O & M Constructional Miscellaneous			
Location	De Pere 22251SAN			Work Order			
Northing	Easting			Elevation			
Coordinate System	GPS Accuracy						

Notes	Scores	Structural:	Pipe Rating 0	Pipe Ratings Index 0	Quick Rating 0000
		O&M:	Pipe Rating 20	Pipe Ratings Index 2	Quick Rating 2A00
		Overall	Pipe Rating 20	Pipe Ratings Index 2	Quick Rating 2A00

MH 49.1 (MH on Main St.)
 Precast construction / Good condition
 Open pick hole

MH 50.1
 Precast construction / Good condition
 No Cretex seal

Section measures 398'



APPENDIX D – PHOTOS



Figure 1 – STA. 10+00 24-inch Manhole at Grant Street.

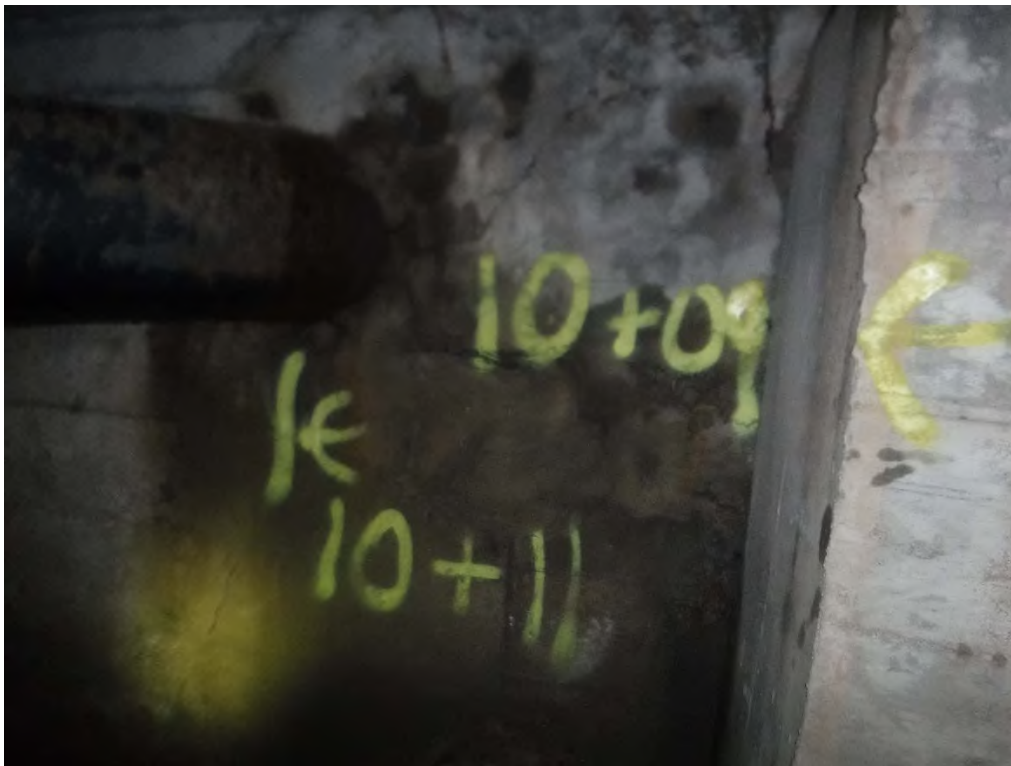


Figure 2 – STA. 10+09, Construction joint and 12" DI Sanitary Sewer.

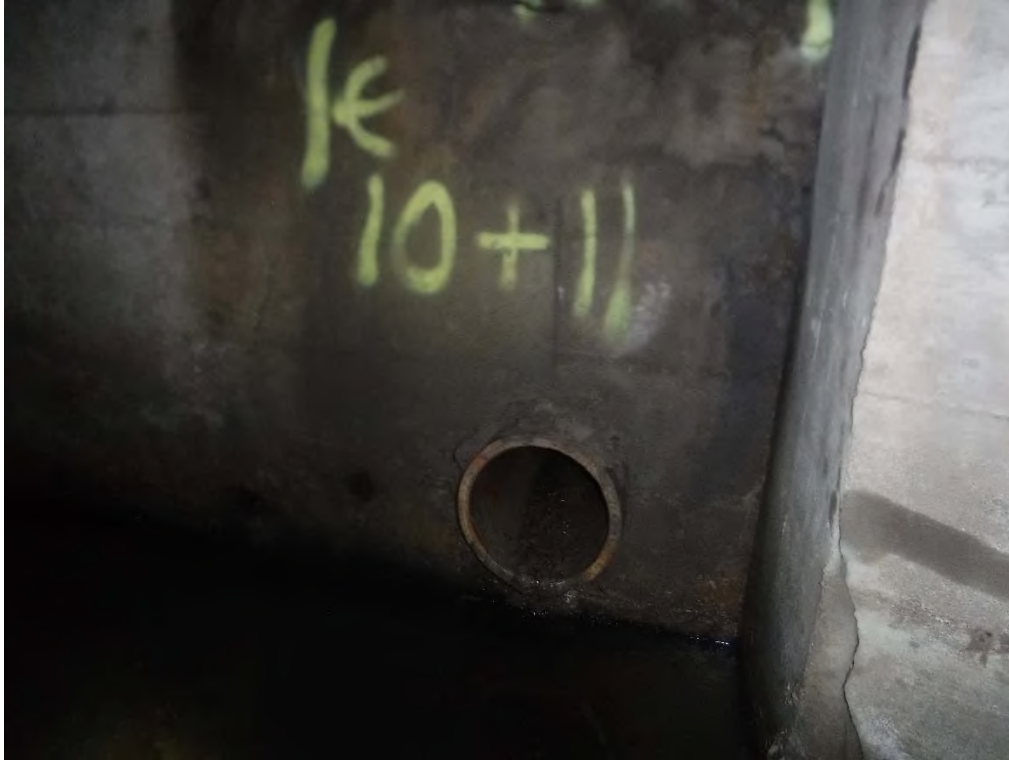


Figure 3 – STA. 10+10, Storm Connection 8" Clay.



Figure 4 – STA. 10+11, 12" DI Sanitary Sewer.



Figure 5 – STA. 10+13, 12" DI Sanitary Sewer.



Figure 6 – STA. 10+25, Sealed Manhole.



Figure 7 – STA. 10+30. Construction joint recommended grout repair.



Figure 8 – STA. 10+55, storm inlet.

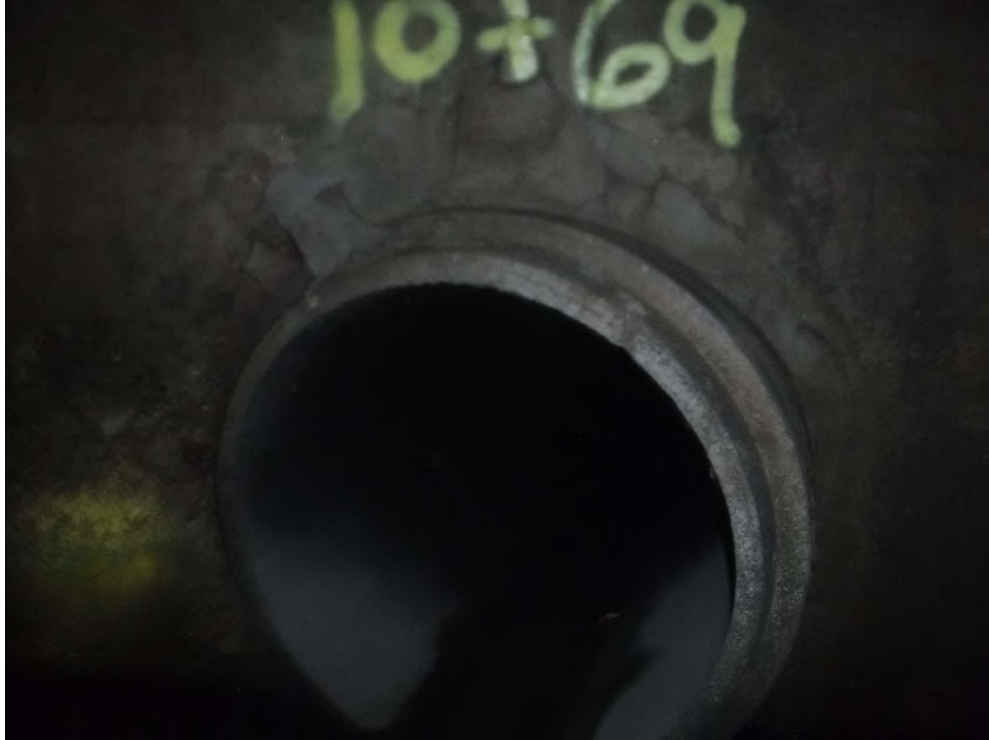


Figure 9 - STA. 10+69, 30" concrete. Recommend grouting connection.

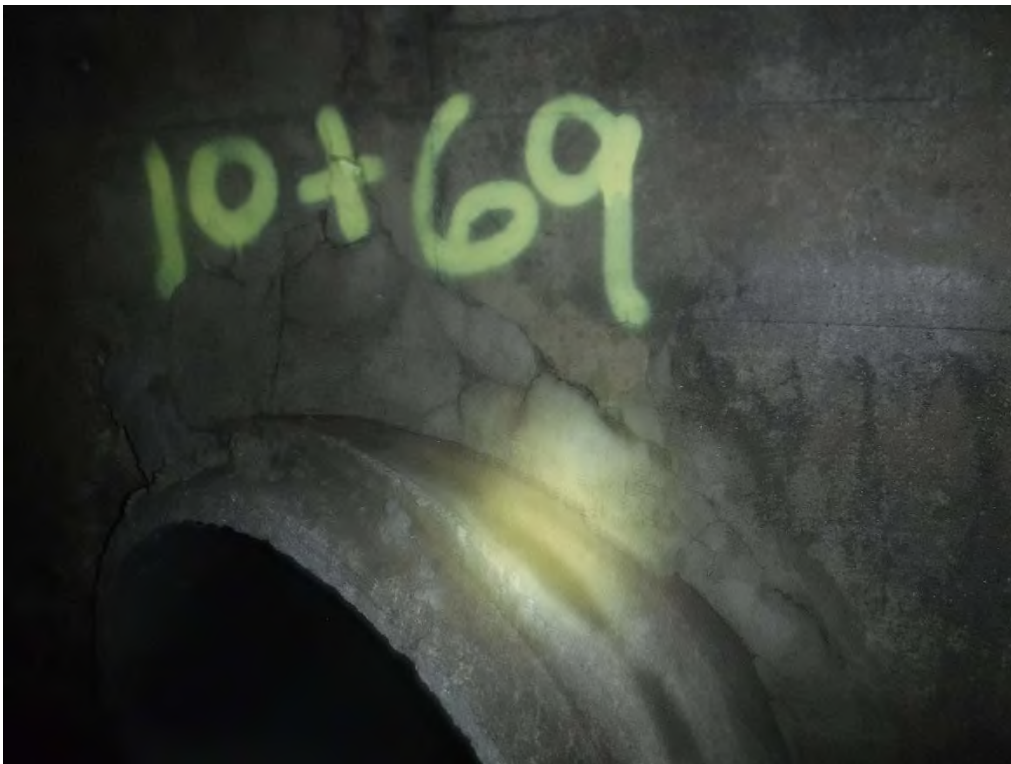


Figure 10 - STA. 10+69, 30" concrete. Recommend grouting connection.



Figure 11 - STA.10+90 6" DI. Recommended grout connection.



Figure 12 - STA. 11+00, recommend grout repair.



Figure 13 - STA. 11+28, ceiling delamination.



Figure 14 - STA. 11+32, 48-inch diameter storm sewer lining.



Figure 15 - 48" storm sewer lining in failure.



Figure 16 - STA. 15+2148" storm sewer lining.



Figure 17 - STA. 15+30 railroad arch bridge structure.



Figure 18 - STA. 15+30 railroad arch bridge structure.



Figure 19 - STA. 15+30 infiltration.



Figure 20 - STA. 15+30 infiltration.



Figure 21 - STA. 15+50



Figure 22 - STA. 15+50



Figure 23 - STA. 15+50



Figure 24 - STA. 15+80.



Figure 25 - STA. 16+02, diagonal floor crack.



Figure 26 - STA. 16+10, 18" Concrete connection.



Figure 27 - STA. 16+74 wall void.

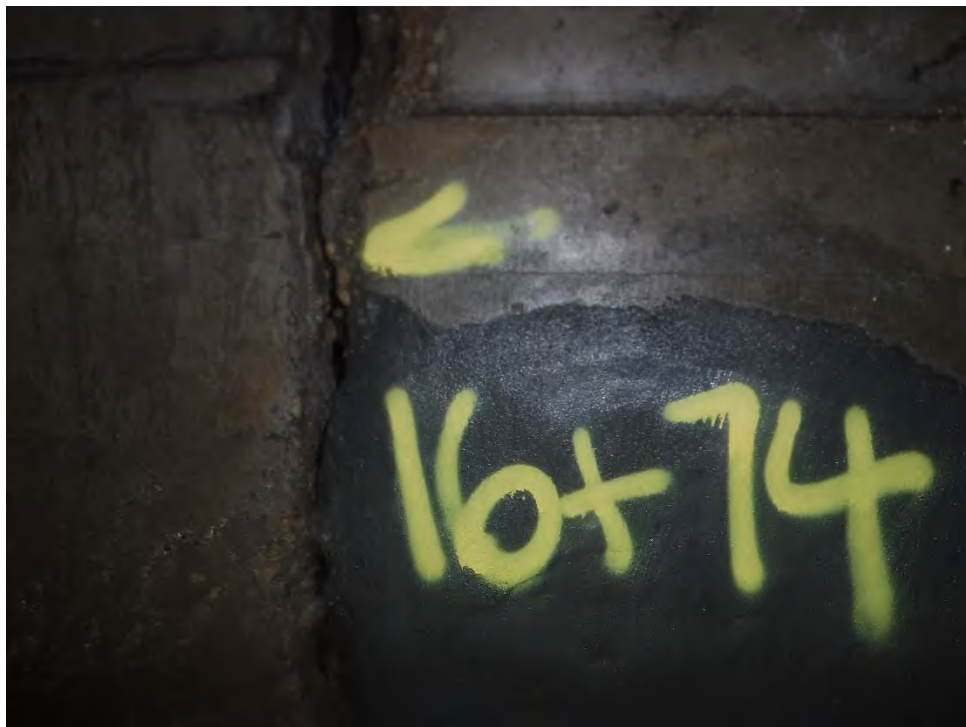


Figure 28 - STA. 16+74 wall void.



Figure 29 - STA. 17+05 wall crack.



Figure 30 - STA. 17+05 crack.



Figure 31 - STA. 17+05 crack.



Figure 32 - STA. 17+35, 8" Clay.

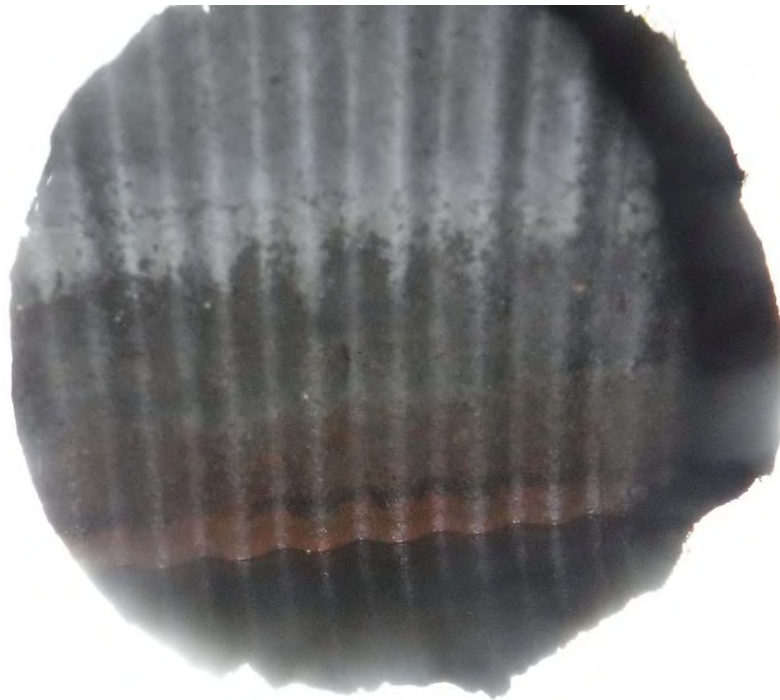


Figure 33 - STA. 17+43 CMP Chamber.

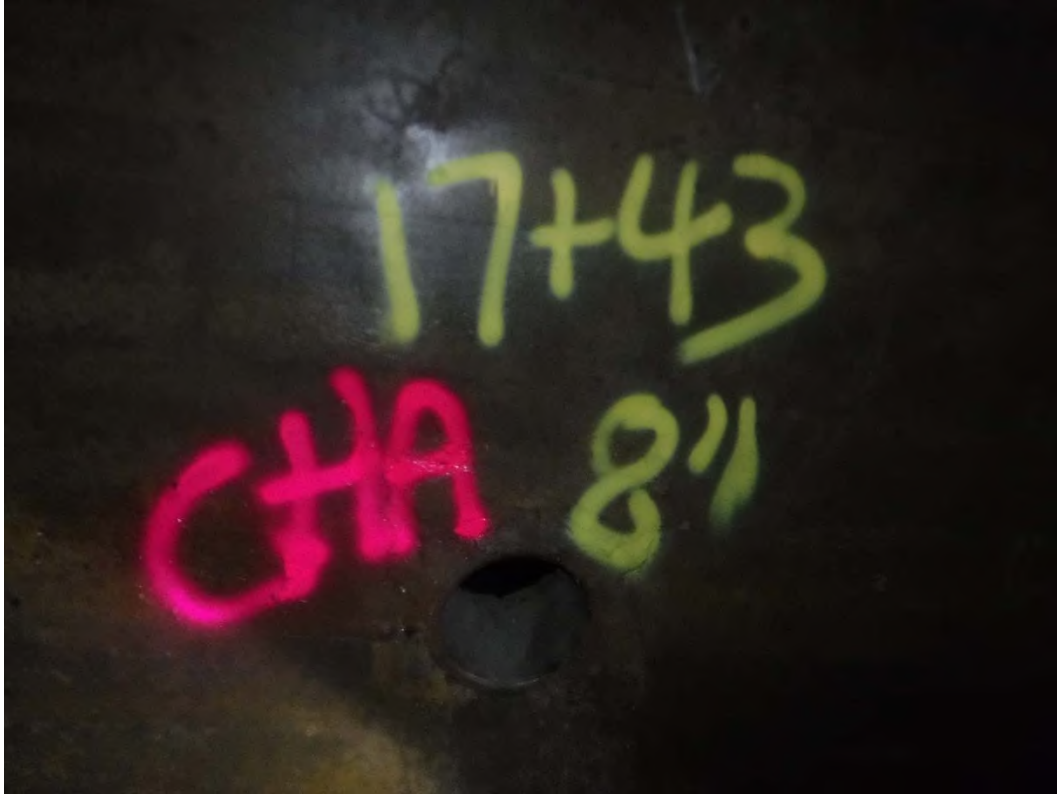


Figure 34 - - STA. 17+43 CMP Chamber.



Figure 35 - STA. 17+50, sealed manhole.



Figure 36 - STA. 17+60 grout repair needed.



Figure 37 - STA. 17+92 connection and debris.



Figure 38 - STA. 17+92 connection and debris.



Figure 39 - STA. 17+94 connection.

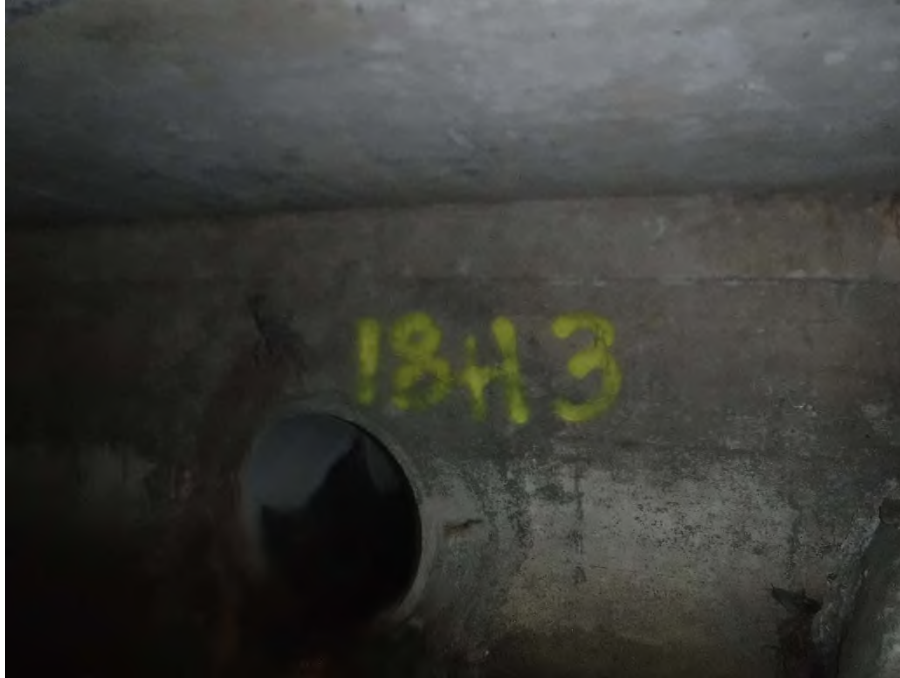


Figure 42 - STA. 18+13 15" Storm

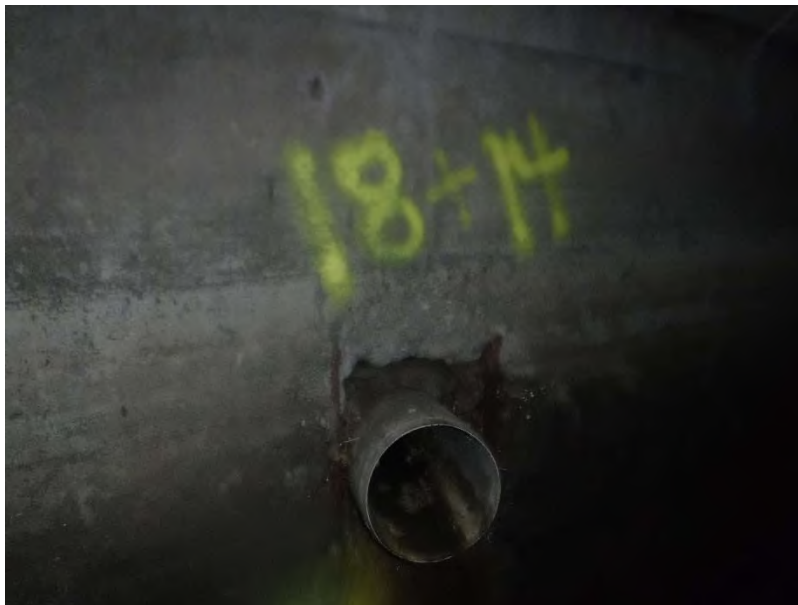


Figure 43 - STA. 18+14 8" PVC.



Figure 44 - STA. 18+19 construction joint.



Figure 45 - STA. 18+19 construction joint.



Figure 46 - STA. 18+56 8" PVC.



Figure 47 - STA. 18+63 Ceiling patch.



Figure 48 - STA. 18+63 4" PVC.



Figure 49 - STA. 18+65 Horizontal crack.



Figure 50 - STA. 18+70 4" PVC.

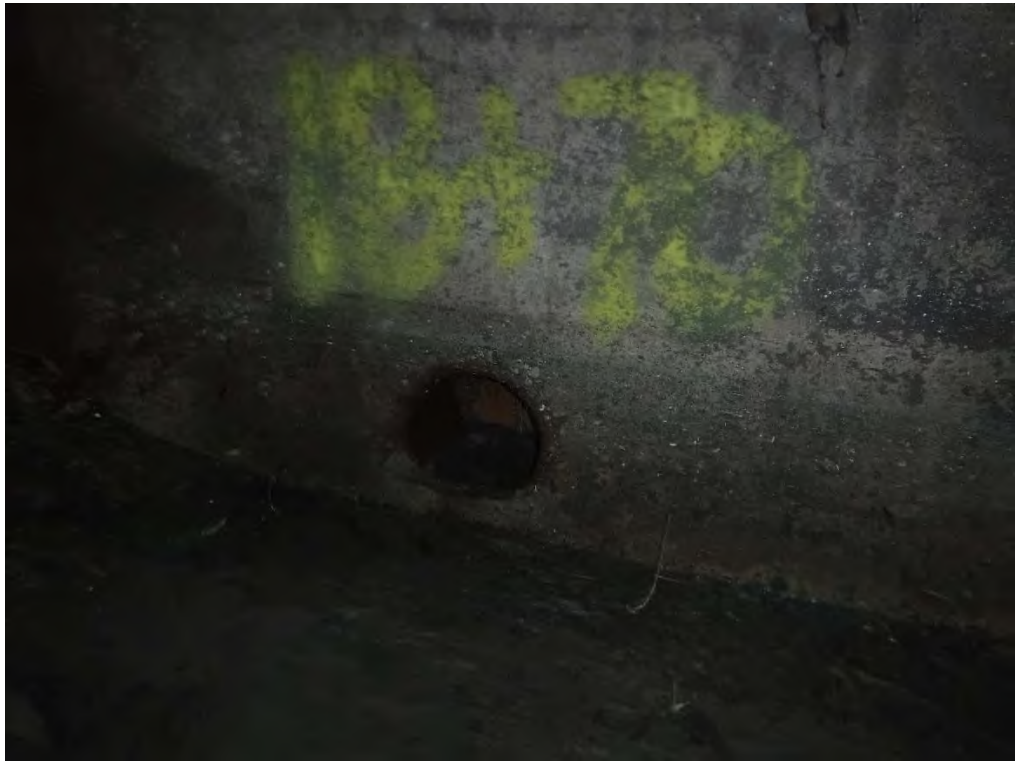


Figure 51 - STA. 18+70, 8" clay

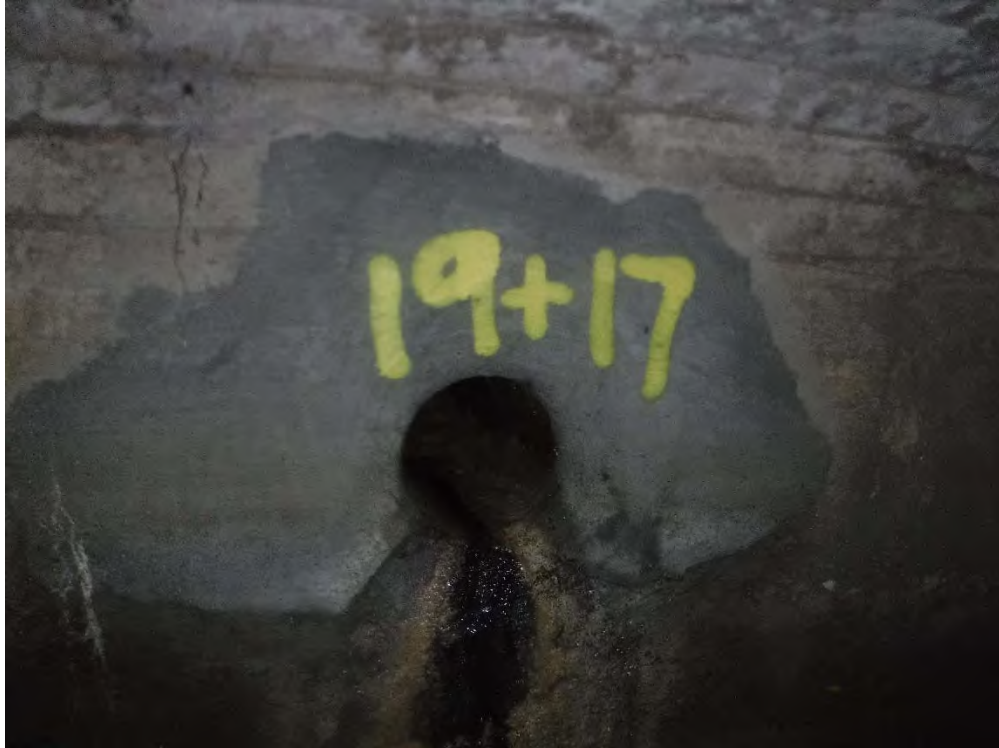


Figure 52 - STA. 19+17 8" clay.



Figure 53 - STA. 19+35 horizontal crack.



Figure 54 - STA. 19+21 12" PVC.

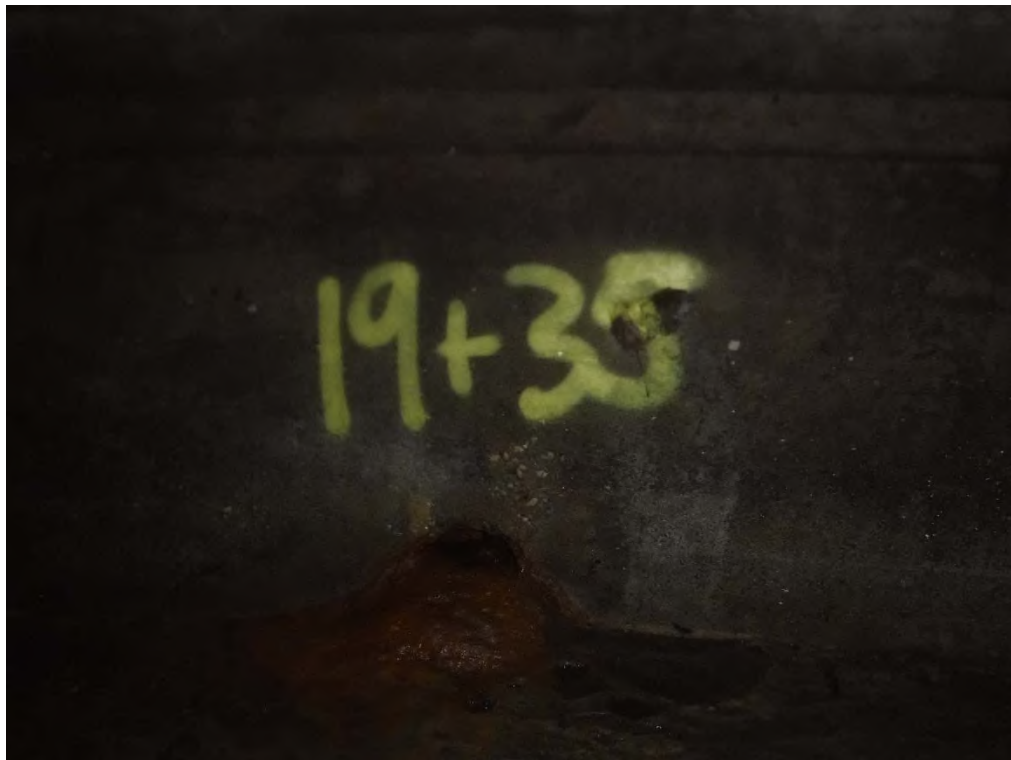


Figure 55 - STA. 19+35 4" Clay.



Figure 56 - STA. 19+35 8" Clay.



Figure 57 - STA. 19+36 steel plate repair in ceiling.

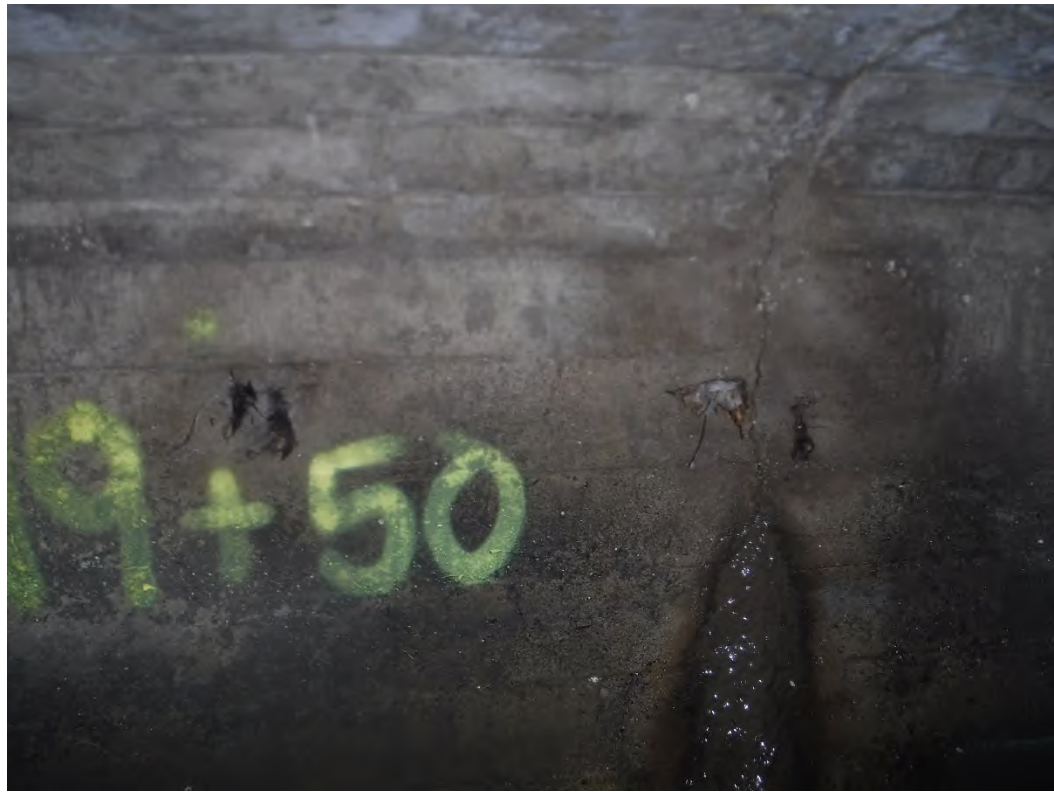


Figure 58 - STA. 19+50 construction joint filtration.

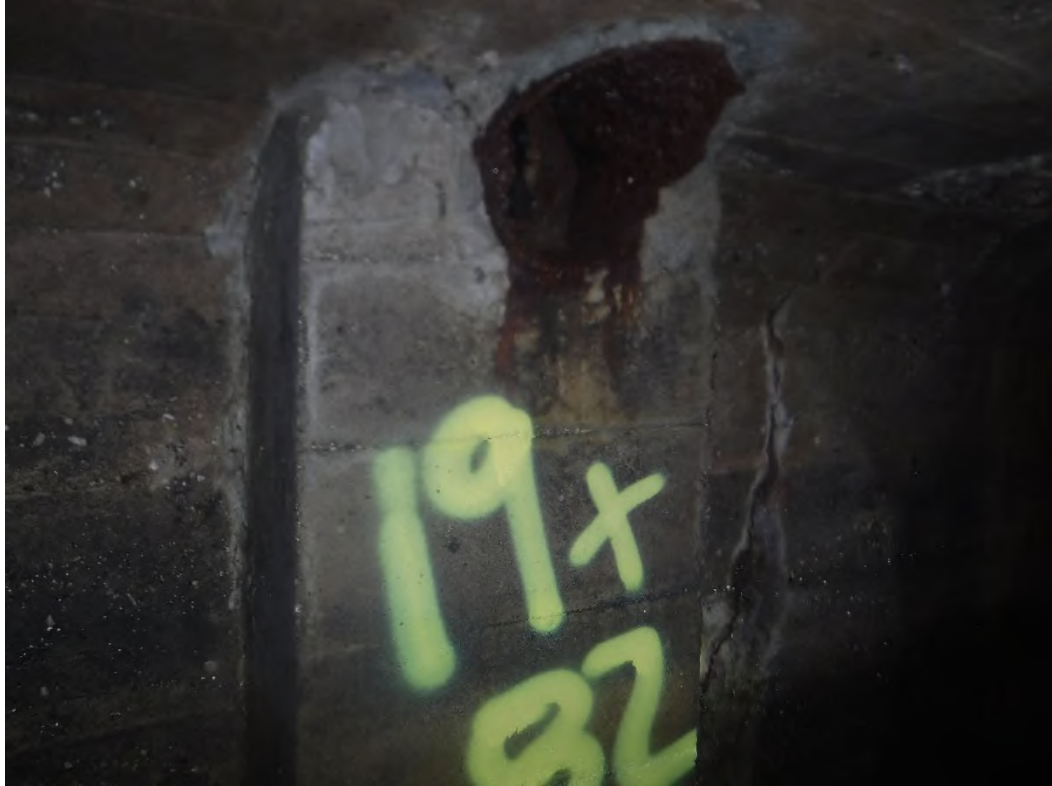


Figure 59 - STA. 19+82 8" CI



Figure 60 - STA. 19+96 construction joint with 3/4" opening.



Figure 61- STA. 19+96 construction joint with 3/4" opening.



Figure 62 - STA. 20+00 ceiling delamination and infiltration.

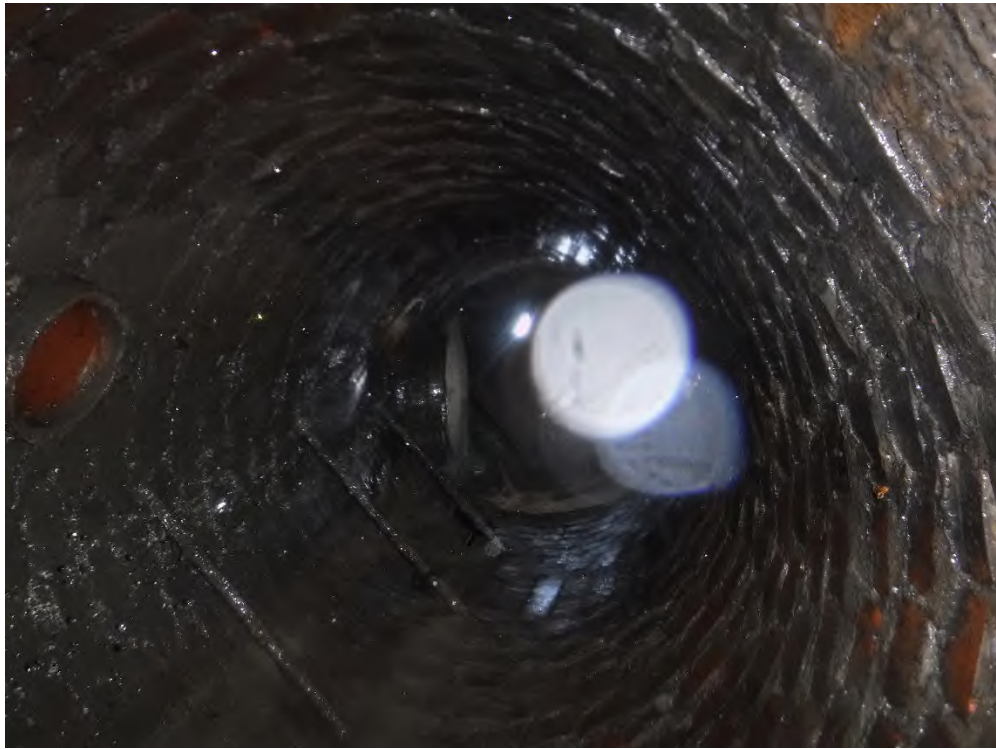


Figure 63 - STA. 20+18 MH with infiltration.



Figure 64 - STA. 20+18 18" Concrete and infiltration.



Figure 65 - STA. 20+28 8" clay connection.



Figure 66 - STA. 20+45 ceiling failure.

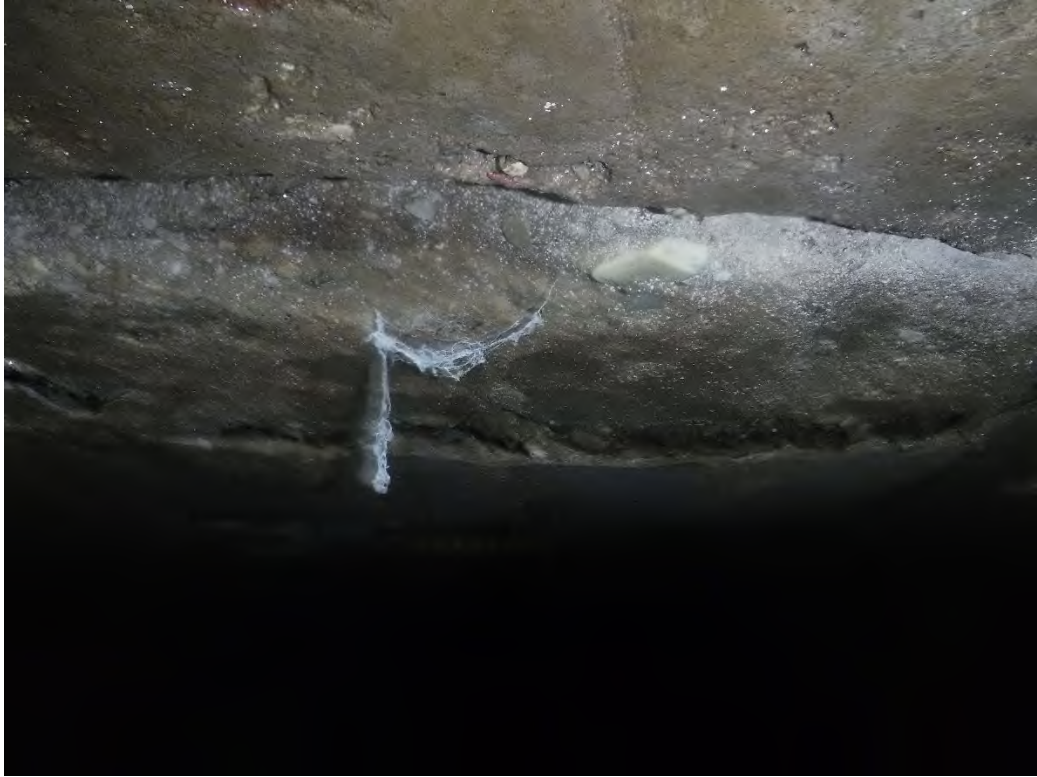


Figure 67 - STA. 20+45 to 20+59 ceiling failure.



Figure 68 - STA. 20+45 to 20+59 ceiling failure.

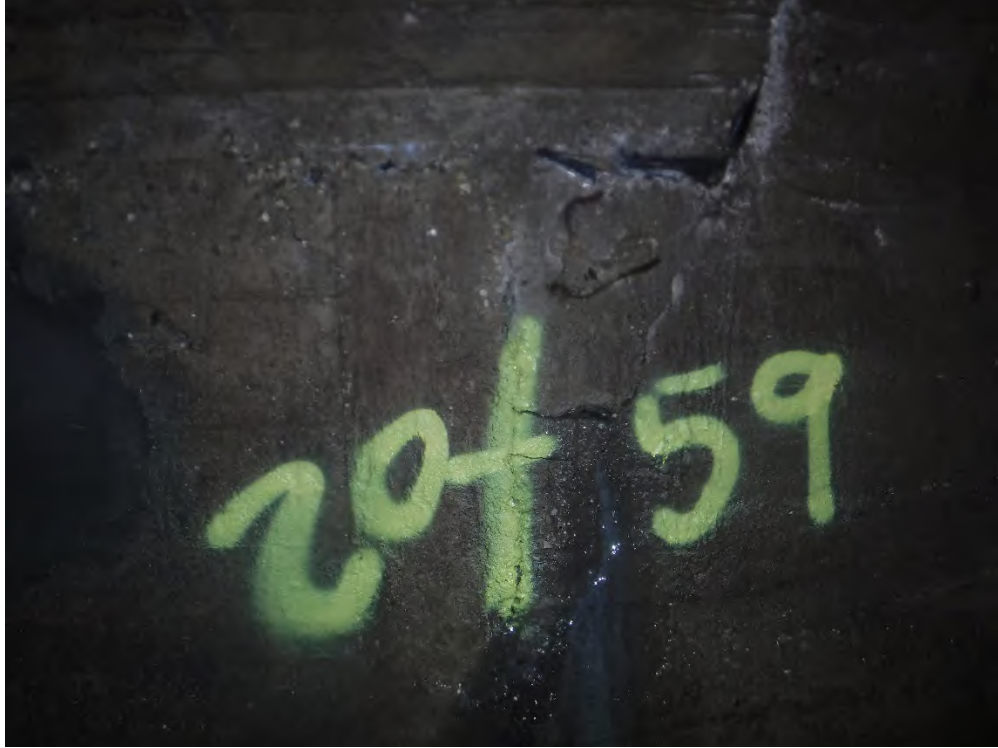


Figure 69 - STA. 20+59 ceiling failure.



Figure 70 - STA. 20+63 6" clay tile.



Figure 71 -STA. 20+63 6" clay tile.



Figure 72 - STA. 20+64 6" Clay



Figure 73 - STA. 20+68 3" Clay.



Figure 74 - STA. 20+81 4" Clay.



Figure 75 - STA. 21+00 construction joint failure at ceiling.



Figure 76 - STA. 21+14 8" Clay.



Figure 77 - STA. 21+25 6" clay.



Figure 78 - STA. 21+26 open sanitary sewer connection.



Figure 79 - STA. 21+26 open sanitary sewer connection.

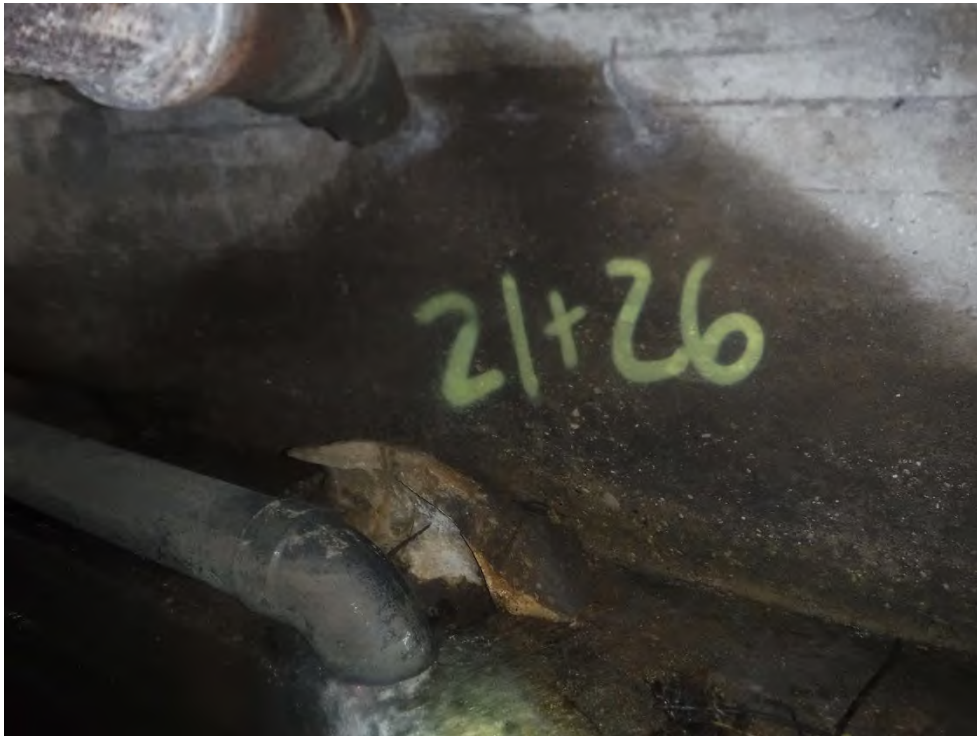


Figure 80 - STA. 21+26 open sanitary sewer connection.



Figure 81 - STA. 21+32 ceiling delamination.



Figure 82 - STA. 21+32 ceiling delamination.



Figure 83 - STA. 21+46 6" clay.



Figure 84 - STA. 21+70 6" clay.



Figure 85 - STA. 22+30 ceiling failure.



Figure 86 - STA. 22+83 break in inlet.



Figure 87 - STA. 22+83 break in inlet.



Figure 88 - STA. 22+91 6" CI.



Figure 89 - STA. 23+05 ceiling delamination.

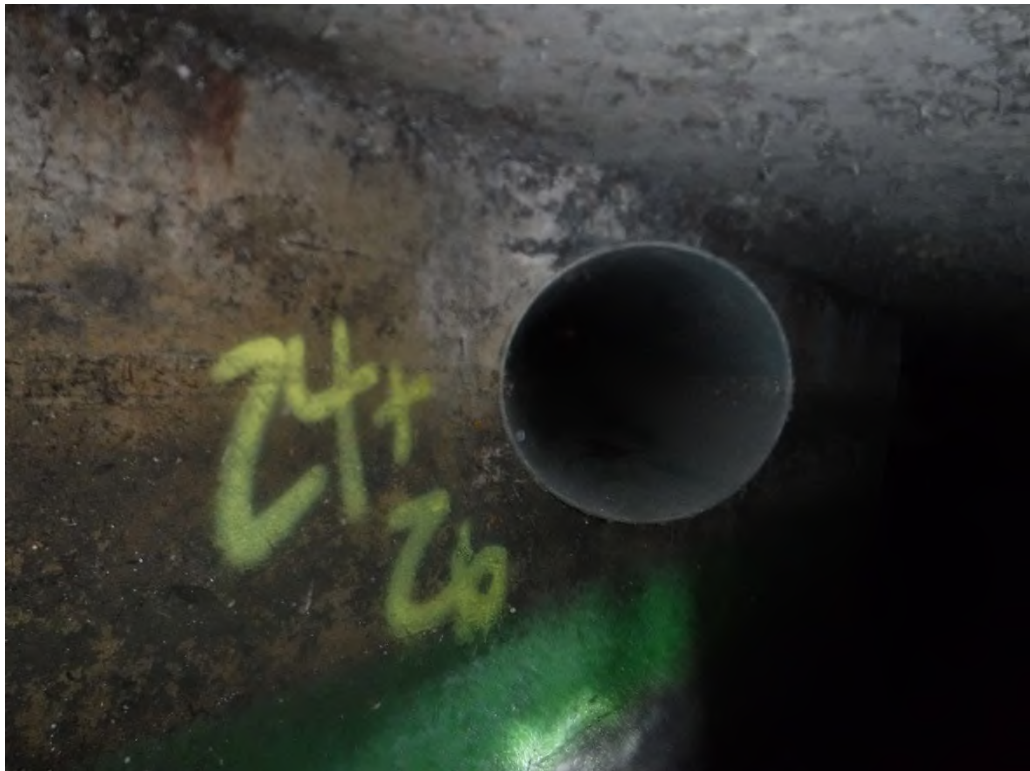


Figure 90 - STA. 24+26 15" PVC.



Figure 91 - STA. 24+28 27" clay.



Figure 92 - STA. 24+36 ceiling failure.



Figure 93 - STA. 24+36 ceiling failure.



Figure 94 - STA. 27+30 new ceiling and adjacent delamination.



Figure 95 - STA. 28+13 construction joint.



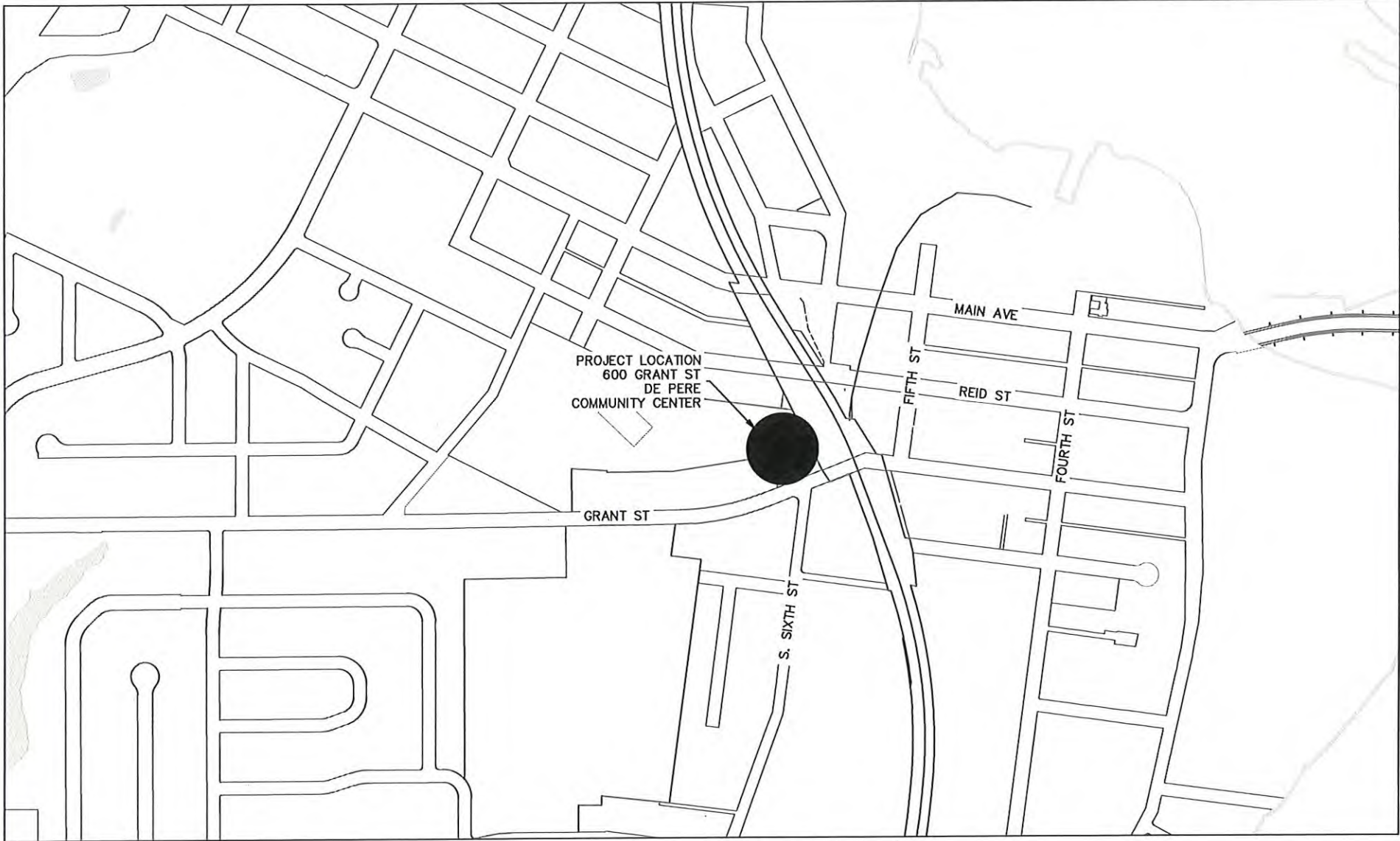
Figure 96 - STA. 28+25 Outfall.

PROJECT# 24-17 COMMUNITY CENTER UTILITY RELAY

CITY OF DE PERE



ENGINEER DIVISION
925 S. SIXTH ST
DE PERE, WI 54115



SITE LOCATION MAP
N.T.S.



SHEET NO.	DESCRIPTION
G001	TITLE SHEET
G002	STANDARD ABBREVIATION & SYMBOLS
C101 - C104	PLAN AND PROFILE SHEETS
C401	REMOVAL AND RESTORATION PLAN
C402	EROSION CONTROL PLAN
C403	STORM MANHOLE DETAIL
C404	BENCHMARKS
E501	ELECTRICAL DETAILS
C501	CONSTRUCTION DETAILS
C502	TRAFFIC CONTROL DETAILS

CITY OF DE PERE
BOARD OF PUBLIC WORKS

11-19-24	<i>Ch Kelly</i>
DATE	CITY ENGINEER
11/19/24	<i>James M. White</i>
DATE	CITY ADMINISTRATOR
11/19/24	<i>J. B...</i>
DATE	MAYOR



LIST OF STANDARD ABBREVIATIONS

ADT AGGR AH ASPH B/B BARR BC BK BL BLVD BLDG BM BOW BSMT C C&G C/C CABC CB CE CI CL CMP CNTY CO CONC CONSTR CONSTR JT CORP CP CTH CTRL JT CTV CY D DIA DI DISCH DW E EA EB EBS EL ELEC EMB ENTR EP EW EXC EXIST F F/F FDN FE FERT FIN GR FL FO FOW FT FTG G GV GW HDPE HR HSE HT HYD I ID IN INL INTERS INV IP L LC LP LS LT MAINT MATL MB MH MP	AVERAGE DAILY TRAFFIC AGGREGATE AHEAD ASPHALT BACK TO BACK BARRICADE BACK OF CURB BACK BASELINE BOULEVARD BUILDING BENCHMARK BACK OF SIDEWALK BASEMENT CUT CURB AND GUTTER CENTER TO CENTER CRUSHED AGGREGATE BASE COURSE CATCH BASIN CONSTRUCTION ENTRANCE CAST IRON PIPE CENTERLINE CORRUGATED METAL PIPE COUNTY CLEANOUT CONCRETE CONSTRUCTION CONSTRUCTION JOINT CORPORATION CONTROL POINT COUNTY TRUNK HIGHWAY CONTROL JOINT CABLE TV CUBIC YARD DEPTH DIAMETER DUCTILE IRON PIPE DISCHARGE DRIVEWAY EAST (SEE ELEC BELOW) EACH EASTBOUND EXCAVATION BELOW SUBGRADE ELEVATION ELECTRIC (E WHEN USED IN LINE STYLE) EMBANKMENT ENTRANCE EDGE OF PAVEMENT ENDWALL EXCAVATION EXISTING FILL FACE TO FACE FOUNDATION FIELD ENTRANCE FERTILIZER FINISHED GRADE FLOWLINE FIBER OPTIC FRONT OF SIDEWALK FOOT FOOTING GAS GAS VALVE GUY WIRE HIGH DENSITY POLYETHYLENE HANDICAP RAMP HOUSE HEIGHT HYDRANT INTERSECTION ANGLE INSIDE DIAMETER INCH INLET INTERSECTION INVERT IRON PIPE OR PIN LENGTH (OF CURVE) LONG CHORD OF CURVE LIGHTPOLE LIFT STATION OR LUMP SUM LEFT MAINTENANCE MATERIAL MAILBOX MANHOLE MARKER POST	N NB NC NE NO NTS NW OD PC PCC PCC PED PLE PVMT PE PI PL POC POT PP PRC PROJ PROP PRZ PSI PT PVC R RCP REBAR REL REM REQD RL ROW RP RR RT RW S SALV SAN SB SDWK SE SF SHLDR SY SS ST STA STD STH STM STRUCT SW TAN T TEL TEMP TLE TOC TOW TRANS TYP UG USH VC VERT VOL VPC VPI VPRC VPT W WB WM WSO WV YD	NORTH NORTHBOUND NORMAL CROWN NORTHEAST NUMBER NOT TO SCALE NORTHWEST OUTSIDE DIAMETER POINT OF CURVATURE POINT OF COMPOUND CURVE PORTLAND CEMENT CONCRETE PEDESTAL PERMANENT LIMITED EASEMENT PAVEMENT PRIVATE ENTRANCE POINT OF INTERSECTION PROPERTY LINE POINT OF CURVE POINT ON TANGENT POLYETHYLENE POINT OF REVERSE CURVATURE PROJECT PROPOSED PROTECTIVE ROOT ZONE POUND PER SQUARE INCH POINT OF TANGENCY POLYVINYL CHLORIDE RANGE OR RADIUS REINFORCED CONCRETE PIPE REINFORCEMENT BAR RELOCATE REMAINING REQUIRED REFERENCE LINE RIGHT OF WAY REFERENCE POINT RAILROAD RIGHT RETAINING WALL SOUTH SALVAGE SANITARY SOUTHBOUND SIDEWALK SOUTHEAST SQUARE FEET SHOULDER SQUARE YARD SANITARY SEWER STREET (ST WHEN USED FOR STORM SEWER LINE) STATION STANDARD STATE HIGHWAY TRUNK STORM STRUCTURE OR STRUCTURAL SOUTHWEST TANGENT TELEPHONE LINE TELEPHONE TEMPORARY TEMPORARY LIMITED EASEMENT TOP OF CURB TOP OF WATER TRANSITION TYPICAL UNDERGROUND US HIGHWAY VERTICAL CURVE VERTICAL VOLUME VERTICAL POINT OF CURVATURE VERTICAL POINT OF INTERSECTION VERTICAL POINT OF REVERSE CURVE VERTICAL POINT OF TANGENCY WEST (W WHEN USED FOR WATER LINE) WESTBOUND WATERMAIN WATER SHUTOFF VALVE WATER VALVE YARD
--	--	--	--

MAPPING & TOPOGRAPHY SYMBOLOGY

DESCRIPTION	SYMBOL	
	EXISTING	PROPOSED
BENCHMARK		
BUSH		
CATCH BASIN/INLET		
CABLE TV BOX		
CONTROL POINT		
ELECTRICAL BOX		
EROSION CONTROL - INLET		
FIBER OPTIC PEDESTAL		
FIELD INLET		
GAS VALVE		
GUY WIRE		
HEDGE		
HYDRANT		
IRON PIPE		
LIGHTPOLE		
MAILBOX		
MANHOLE ELECTRIC		
MANHOLE SANITARY		
MANHOLE STORM		
MONITORING WELL		
POWER POLE		
SIGN		
SOIL BORING		
STUMP		
TELEPHONE MANHOLE		
TELEPHONE PEDESTAL		
TREE		
WELL		
WATER SERVICE VALVE		
BUTTERFLY WATER VALVE		
WATER VALVE		

GENERAL CONSTRUCTION NOTES:

1. ALL ELEVATIONS ARE REFERENCED TO NAVD 88.
2. THE WORK UNDER THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE CITY OF DE PERE, CURRENT CONSTRUCTION SPECIFICATIONS AND THESE SPECIAL PROVISIONS AND PLANS, AND THE LATEST ADDITION OF THE WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARDS SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION SPECIFICATIONS, LATEST EDITION, WHERE REFERENCED IN THE CITY SPECIFICATIONS.
3. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION AND SHALL CONFIRM TO THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES CONSTRUCTION SITE EROSION CONTROL AND TECHNICAL STANDARDS.
4. EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING EXACT LOCATIONS AND ELEVATIONS OF ALL UTILITIES. WHETHER SHOWN OR NOT, FROM THE OWNERS OF THE RESPECTIVE UTILITIES. ALL UTILITIES OWNERS SHALL BE NOTIFIED BY THE CONTRACTOR 72 HOURS PRIOR TO EXCAVATION.

MAPPING & TOPOGRAPHY SYMBOLOGY

DESCRIPTION	SYMBOL	
	PLAN	
EXISTING SANITARY SEWER LINE	(SIZE AND MATERIAL) SAN	
PROPOSED SANITARY SEWER LINE	<u>100'-8" PVC SAN</u> SAN	
EXISTING STORM SEWER LINE	(SIZE AND MATERIAL) ST	
PROPOSED STORM SEWER LINE	<u>100'-8" PVC STM</u> ST	
EXISTING WATER MAIN LINE	(SIZE AND MATERIAL) W	
PROPOSED WATER MAIN LINE	<u>100'-8" PVC WM (TEE-BEND)</u> W	
EXISTING ELECTRICAL LINE	E	
EXISTING GAS MAIN LINE	G	
EXISTING TELEPHONE LINE	T	
EXISTING CABLE TV LINE	TV	
EXISTING SANITARY LATERAL	SAN	
EXISTING WATER SERVICE	W	
RIGHT OF WAY	ROW	
PROPERTY LINE	PL	
EASEMENT	ESM	
LANDSCAPE FENCE		
SILT FENCE EROSION CONTROL		
EXISTING FIBER OPTIC	FO	
EXISTING MAJOR CONTOUR	--- 615 ---	
EXISTING MINOR CONTOUR	- - - - - 612 - - - - -	
PROPOSED MAJOR CONTOUR	_____ 615 _____	
PROPOSED MINOR CONTOUR	_____ 612 _____	
EXISTING OVERHEAD UTILITY	--- OH --- OH ---	
	PROFILE	
EXISTING SANITARY SEWER LINE	(SIZE AND MATERIAL)	
PROPOSED SANITARY SEWER LINE	<u>100'-8" PVC SAN @ 0.40%</u>	
EXISTING STORM SEWER LINE	(SIZE AND MATERIAL)	
PROPOSED STORM SEWER LINE	<u>100'-8" PVC STM @ 1.0%</u>	
EXISTING WATER MAIN LINE	(SIZE AND MATERIAL)	
PROPOSED WATER MAIN LINE	<u>PROPOSE 8" PVC WM</u>	

PATCH SYMBOLS

ASPHALTIC CONCRETE PAVEMENT	CRUSHED AGGREGATE BASE COURSE
PORTLAND CEMENT CONCRETE	

CITY OF DE PERE

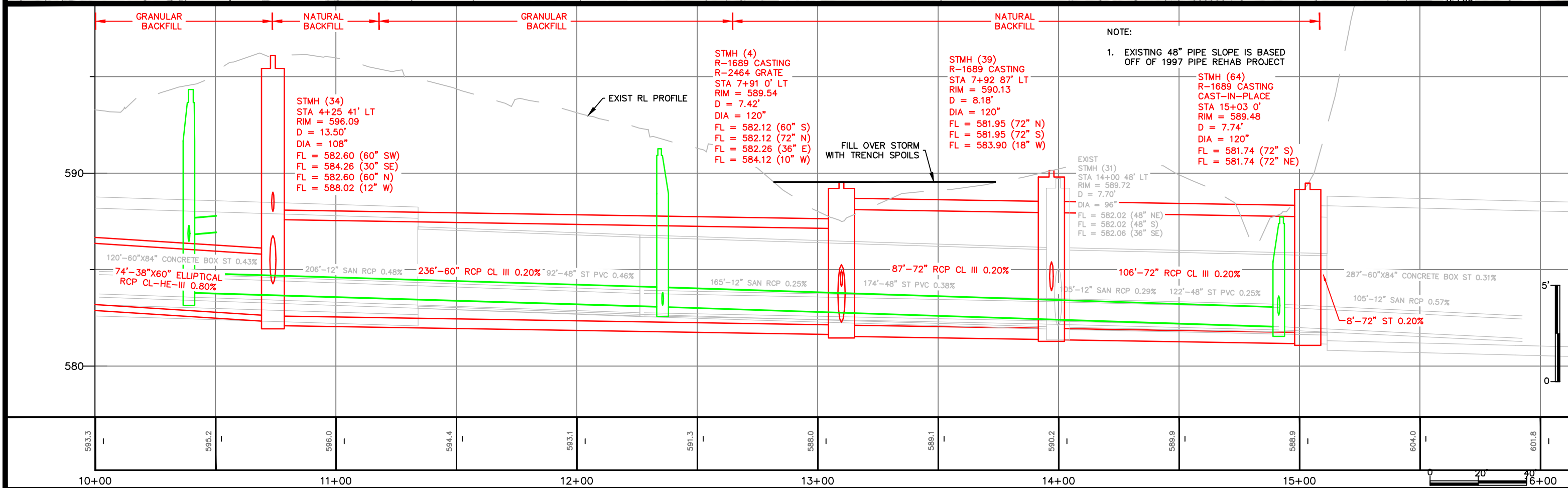
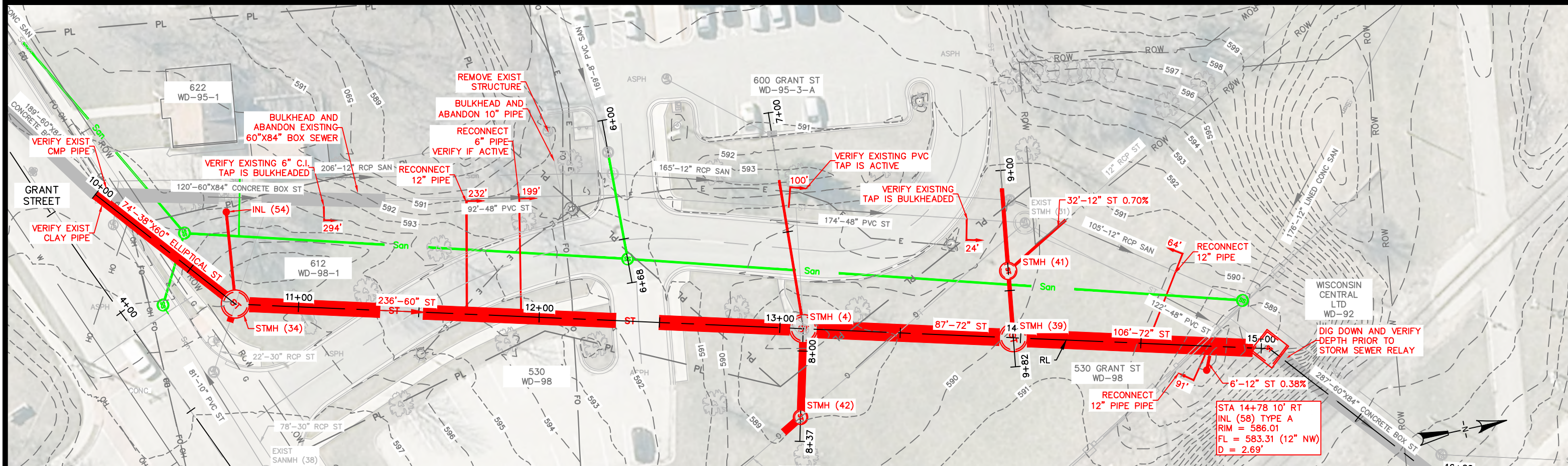
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4060 FAX 920-339-4071

STANDARD ABBREVIATIONS AND SYMBOLS

NAME: COMMUNITY CENTER
UTILITY RELAY
PROJECT # 24-17

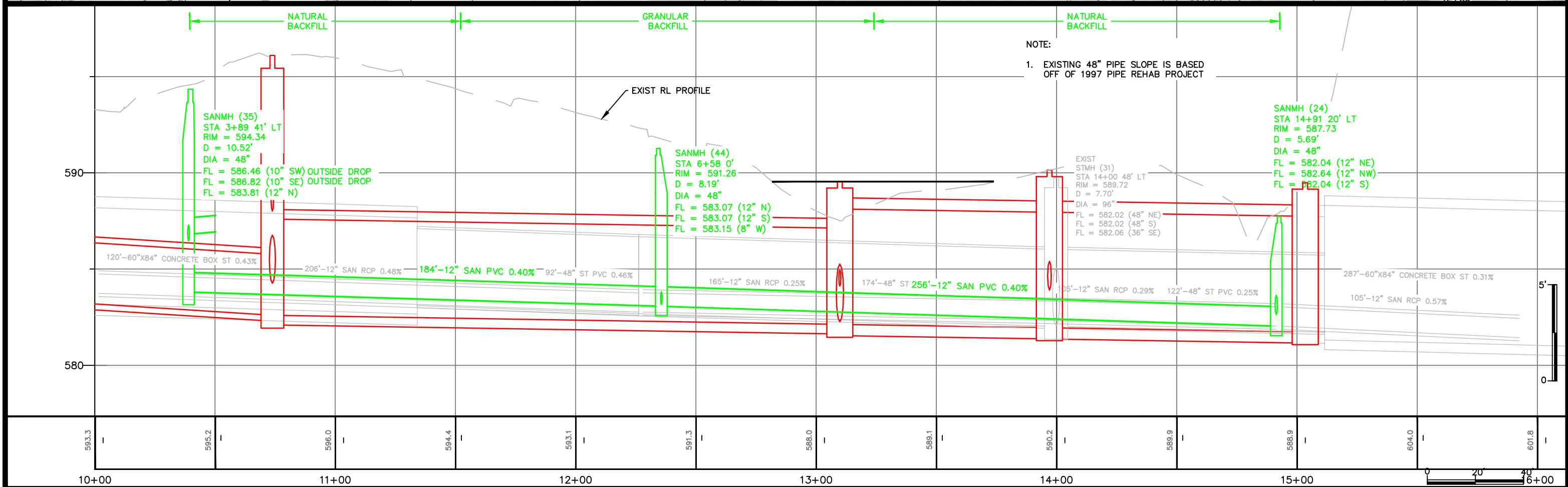
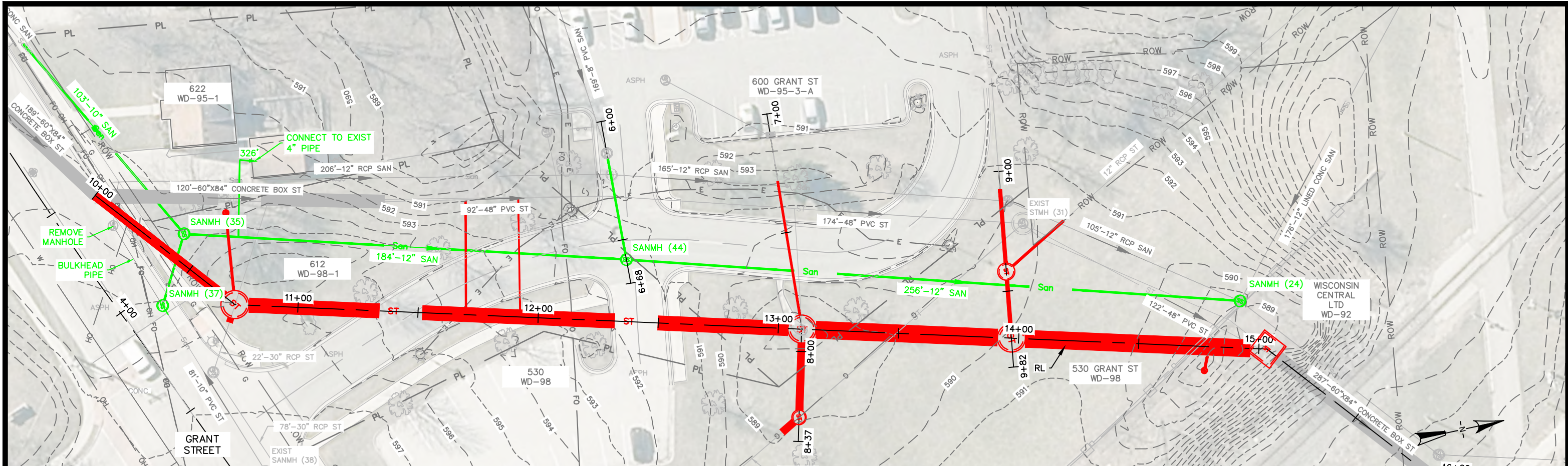
NO.	DATE	REVISIONS / ISSUES		REMARKS
		BY		
SURVEYED				
DRAWN	02-2024	KAD		
DESIGNED				
CHECKED				

PAGE NO.
G002

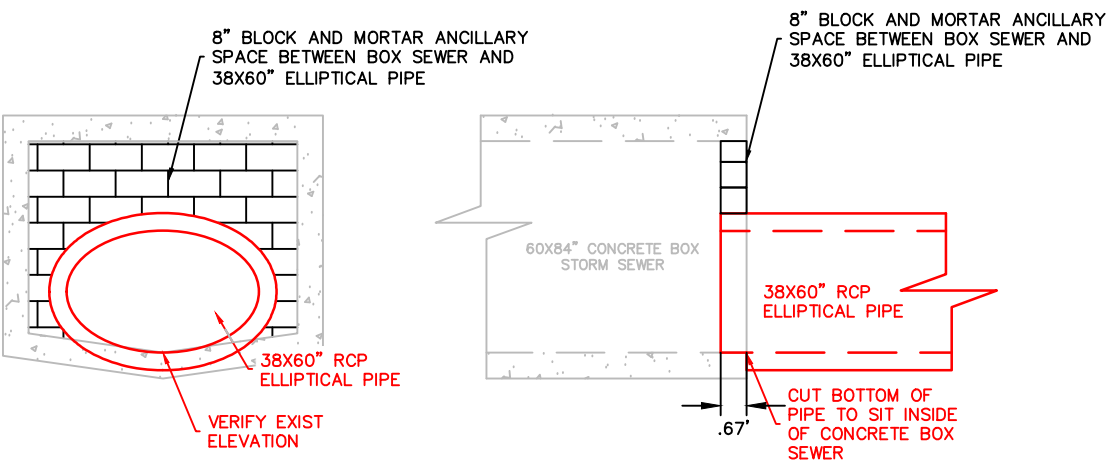
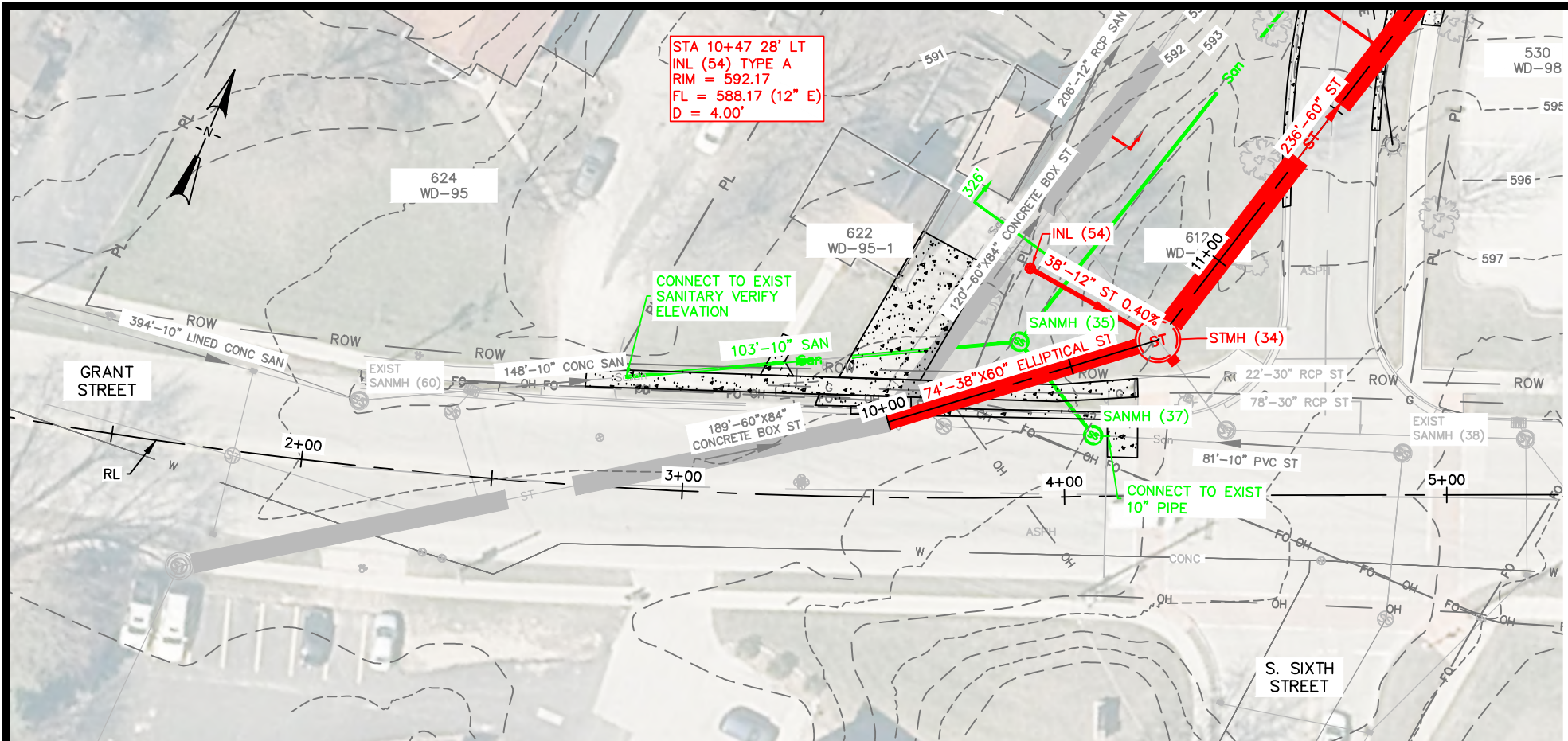


CITY OF DE PERE ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115 OFFICE 920-339-4061 FAX 920-339-4071		COMMUNITY CENTER GRANT STREET TO RAILROAD TRACKS STORM SEWER		NAME: COMMUNITY CENTER UTILITY RELAY PROJECT # 24-17	BY: KAD DATE: 06-2024 DESIGNED: KAD/CHK DATE: 06-2024 CHECKED: EPR DATE: 07-2024	REVISIONS / ISSUES <table border="1"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DATE	BY	REMARKS					PAGE NO. C101
NO.	DATE	BY	REMARKS												

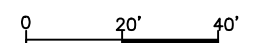
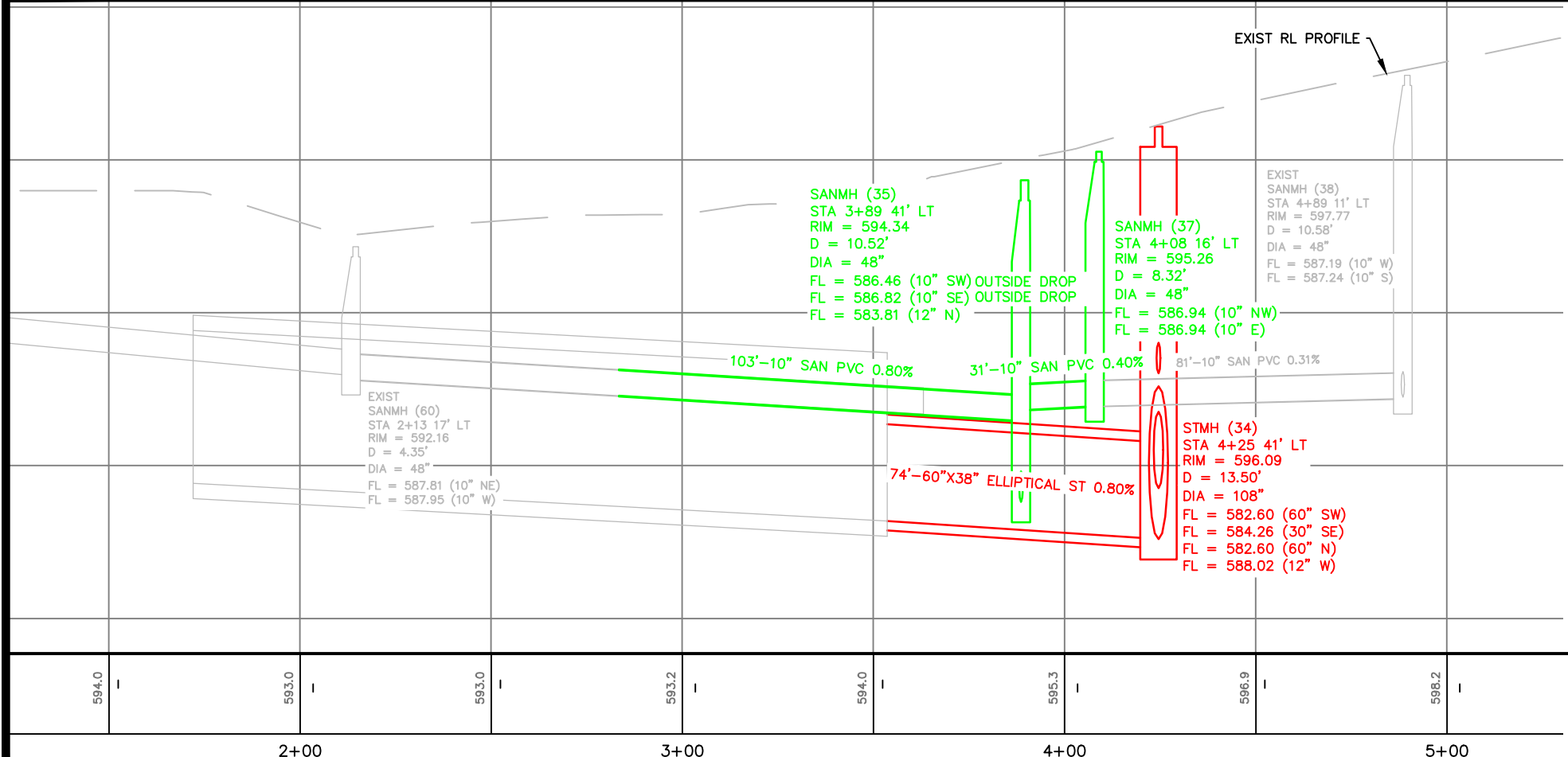
X:\ENG\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg



X:\ENG\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg



STORM SEWER CONNECTION AT STATION 10+00



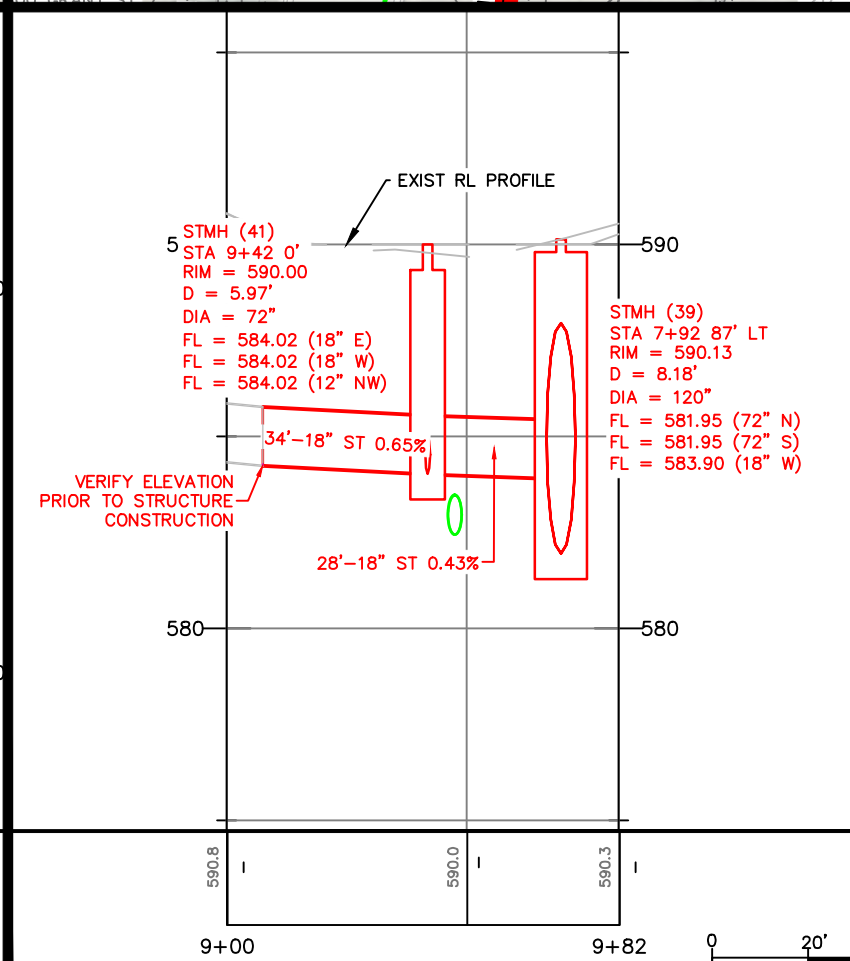
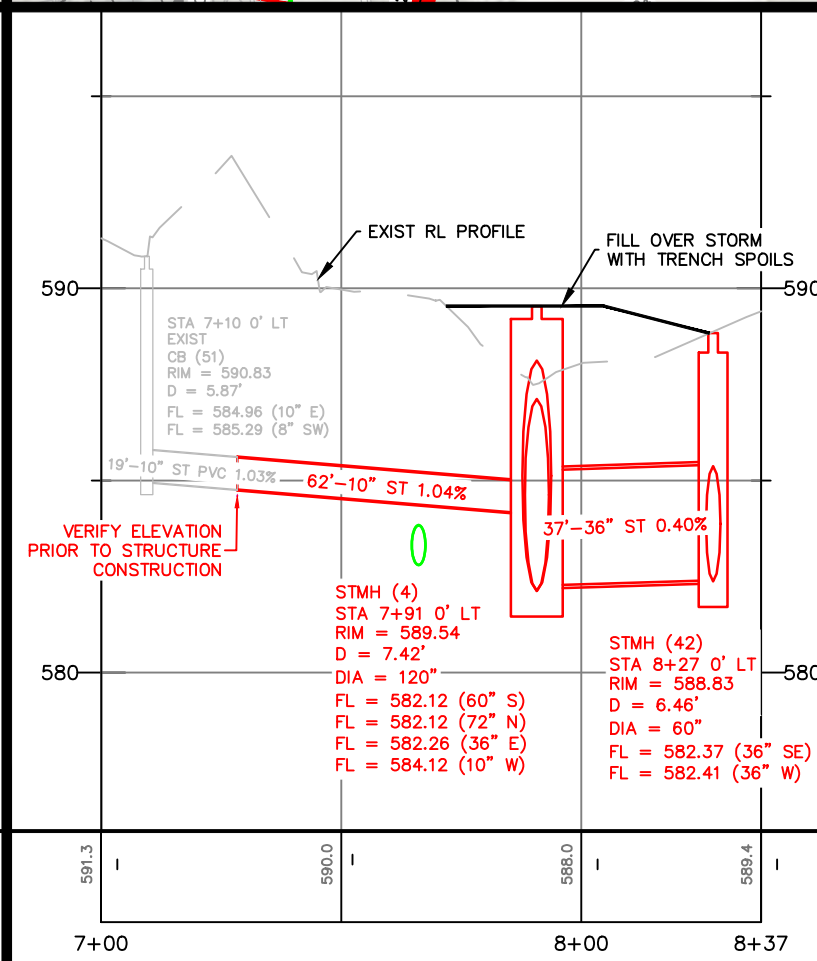
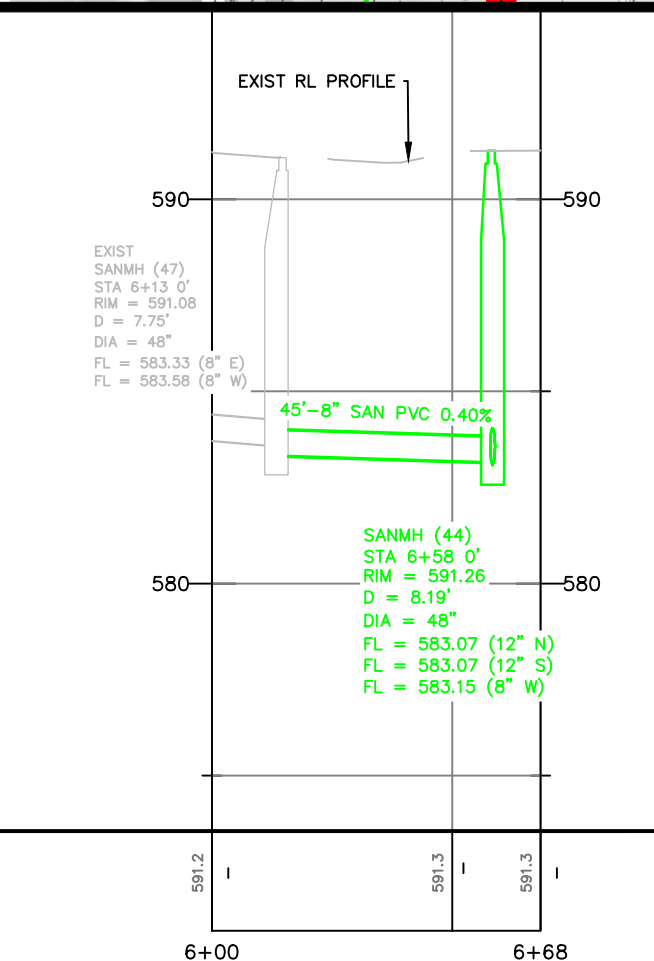
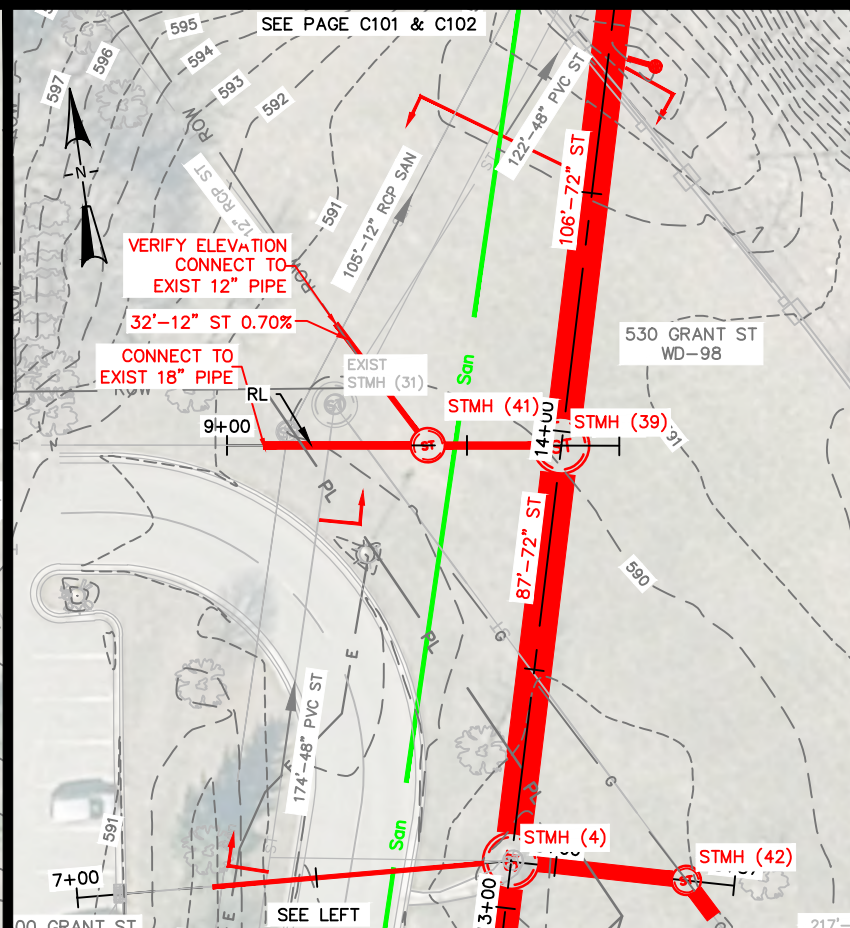
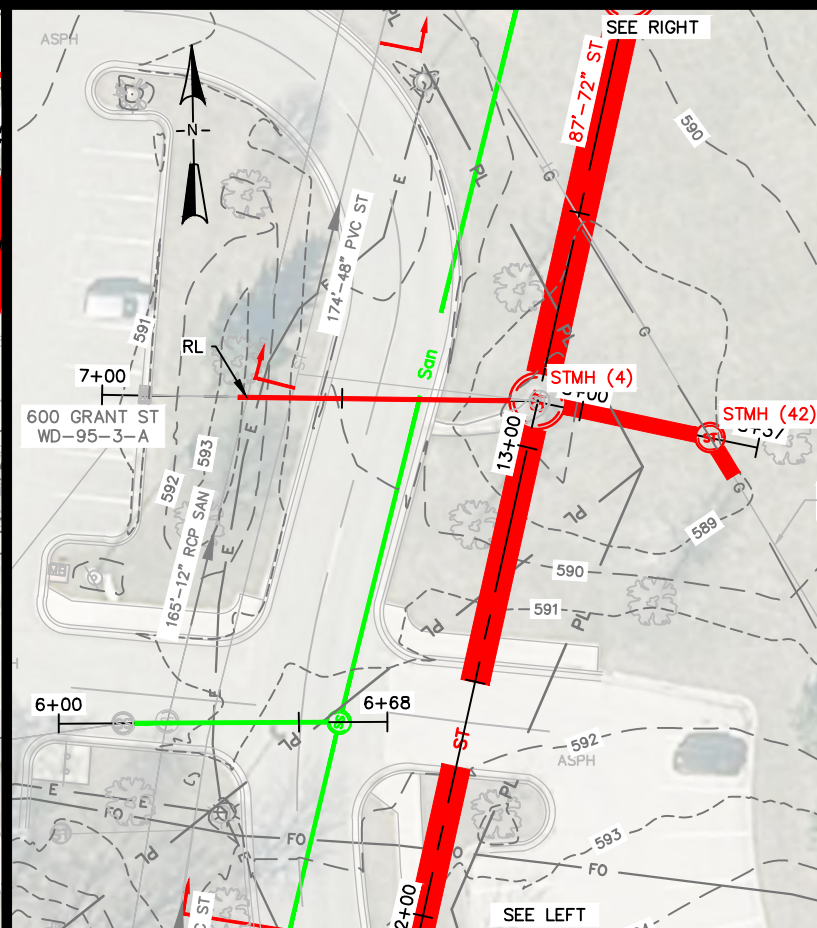
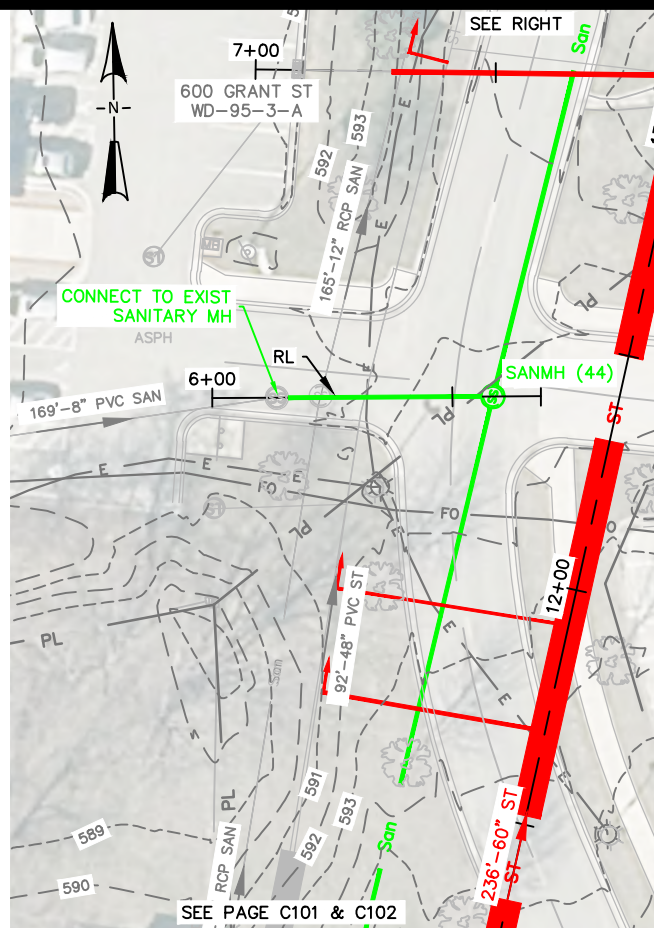
CITY OF DE PERE
 ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
 OFFICE 920-339-4061 FAX 920-339-4071

**COMMUNITY CENTER
 GRANT STREET
 STORM SEWER & SANITARY SEWER**

NAME: COMMUNITY CENTER
 UTILITY RELAY
 PROJECT # 24-17

NO.	DATE	REVISIONS / ISSUES	
		BY	REMARKS
SURVEYED			
DRAWN	KAD	06-2024	
DESIGNED	KAD/CKK	06-2024	
CHECKED	EPR	07-2024	

PAGE NO.
C103



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

**COMMUNITY CENTER
GRANT STREET TO RAILROAD TRACKS
STORM SEWER & SANITARY SEWER**

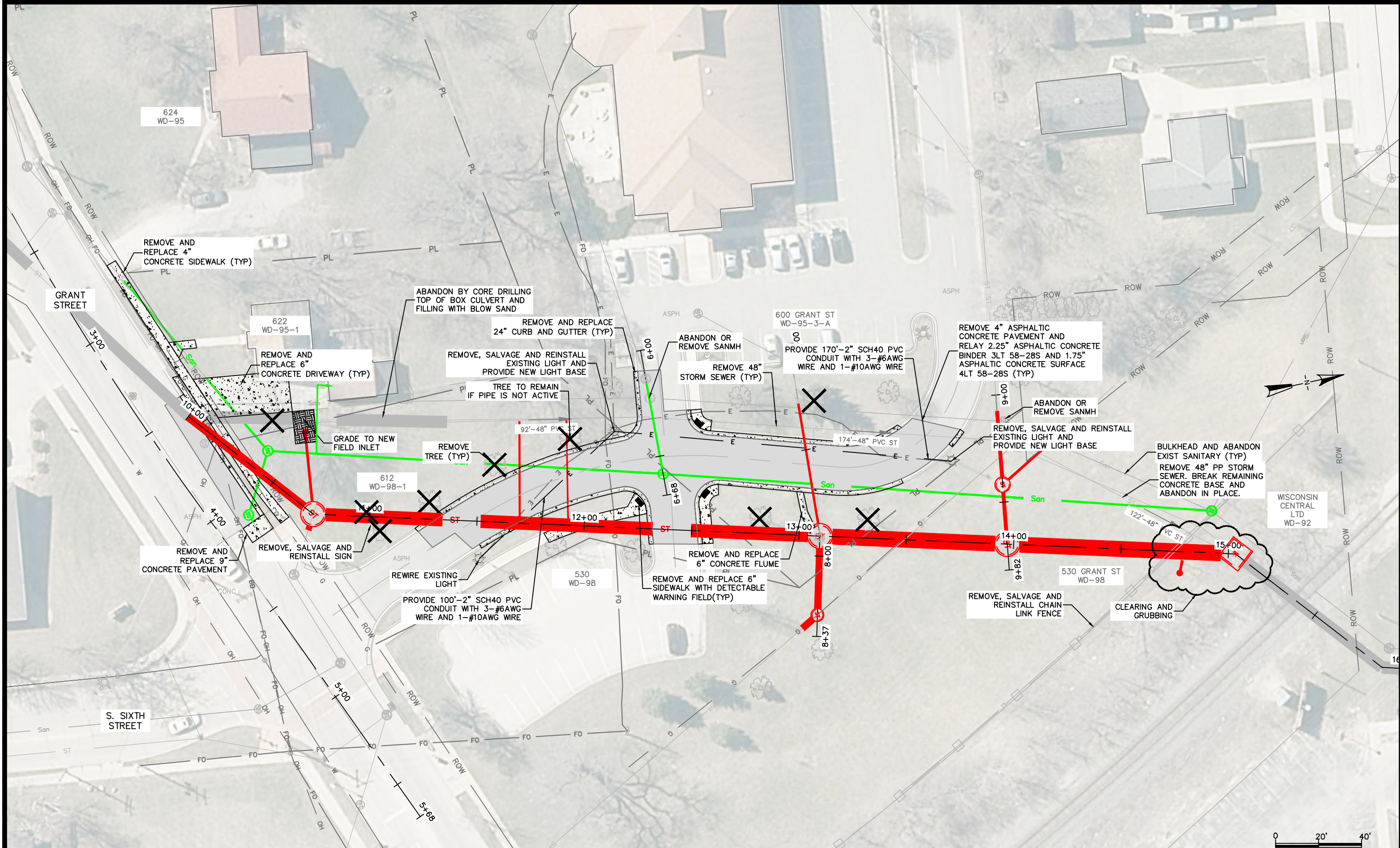
NAME: COMMUNITY CENTER
UTILITY RELAY
PROJECT # 24-17

	BY	DATE
SURVEYED	KAD	06-2024
DRAWN	KAD/CKK	06-2024
DESIGNED	KAD/CKK	06-2024
CHECKED	EPR	07-2024

REVISIONS / ISSUES		
NO.	DATE	REMARKS

PAGE NO.
C104

X:\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
 OFFICE 920-339-4061 FAX 920-339-4071

**COMMUNITY CENTER
 GRANT STREET TO RAILROAD TRACKS
 REMOVAL & RESTORATION PLAN**

NAME:
 COMMUNITY CENTER
 UTILITY RELAY
 PROJECT # 24-17

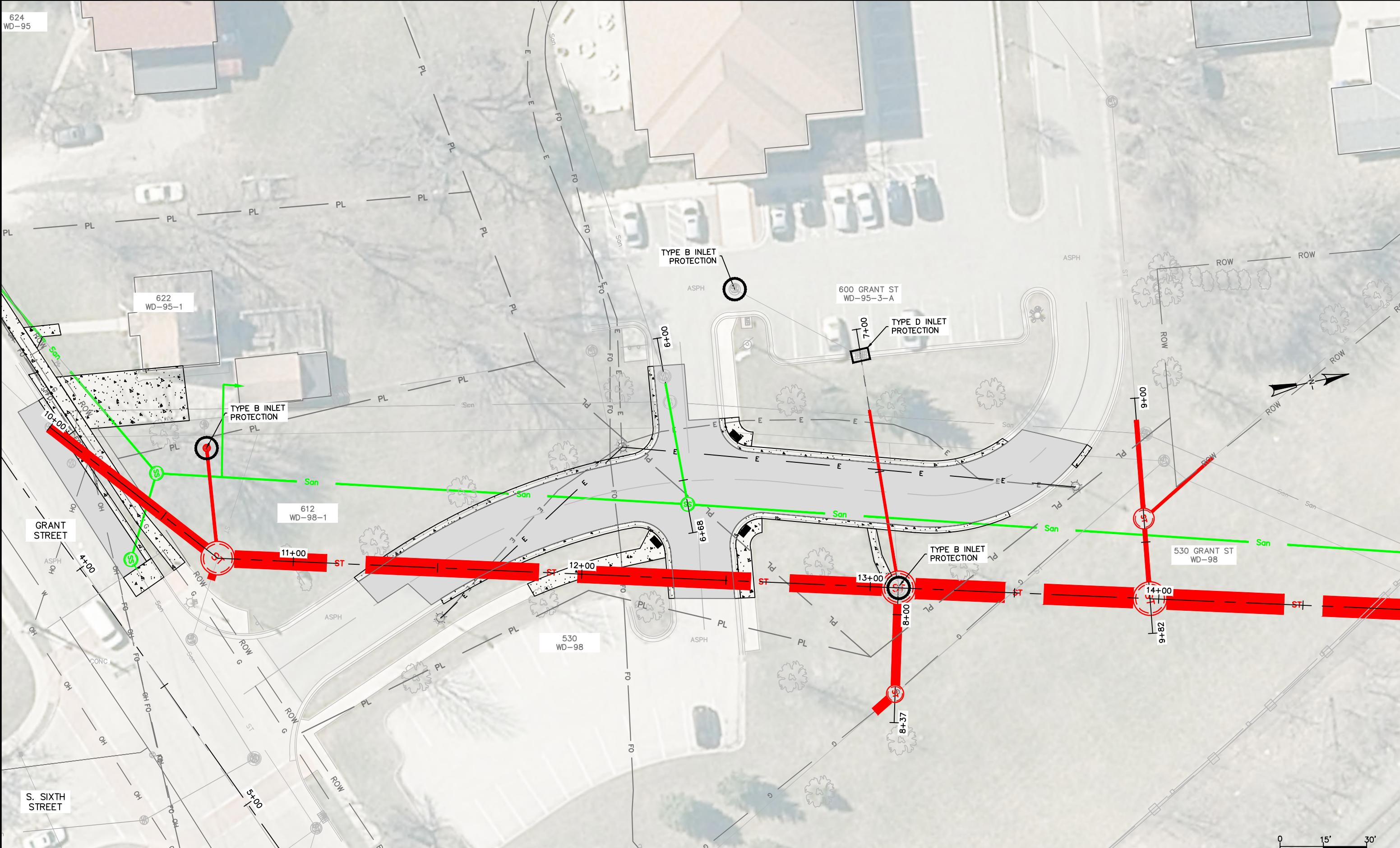
	BY	DATE
SURVEYED	KAD	06-2024
DRAWN	KAD	06-2024
DESIGNED	KAD	06-2024
CHECKED	CKK	07-2024

REVISIONS / ISSUES		
NO.	DATE	REMARKS

PAGE NO.
C401

X:\ENG\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg

624
WD-95



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

**COMMUNITY CENTER
GRANT STREET TO RAILROAD TRACKS
EROSION CONTROL**

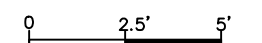
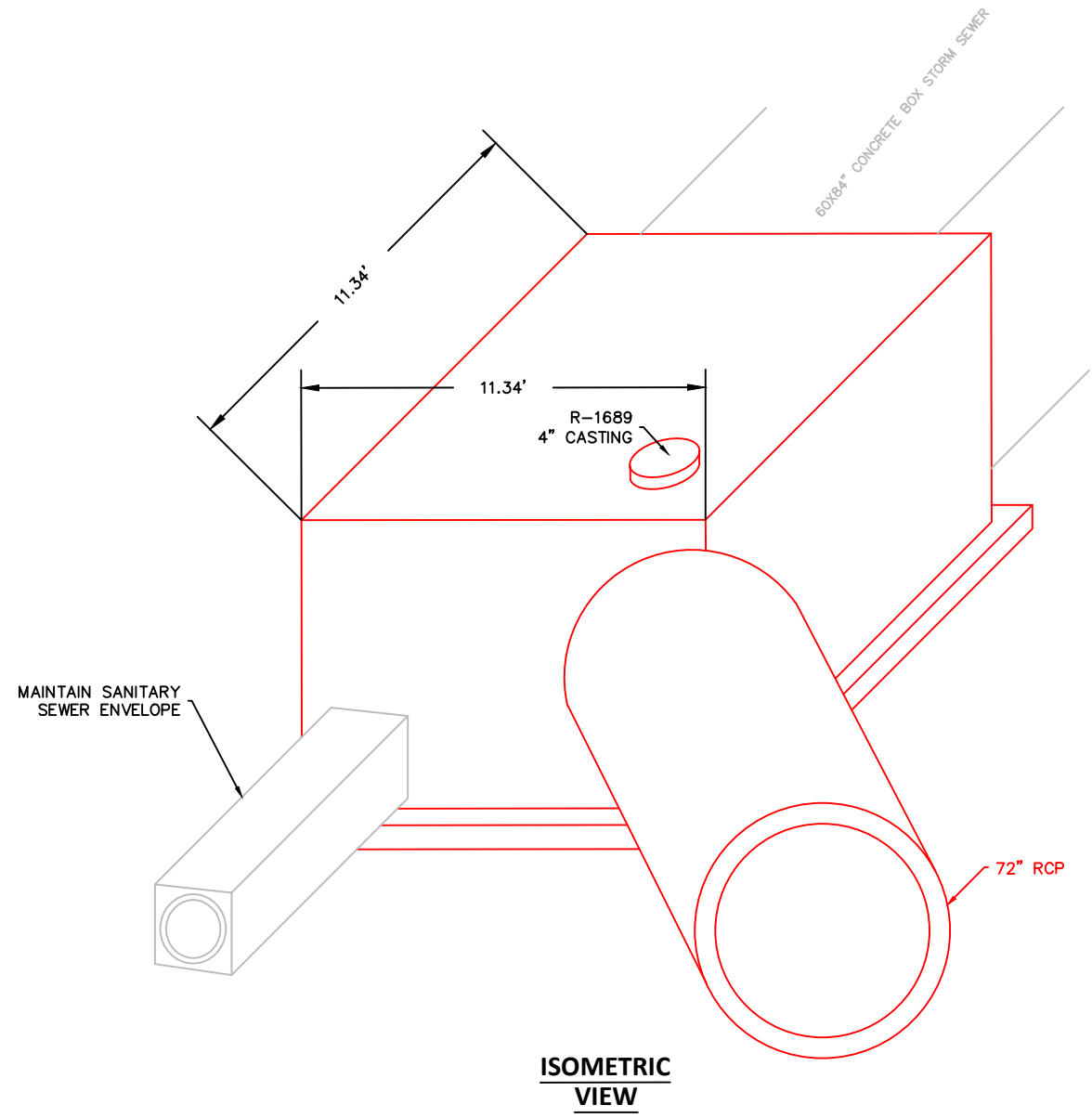
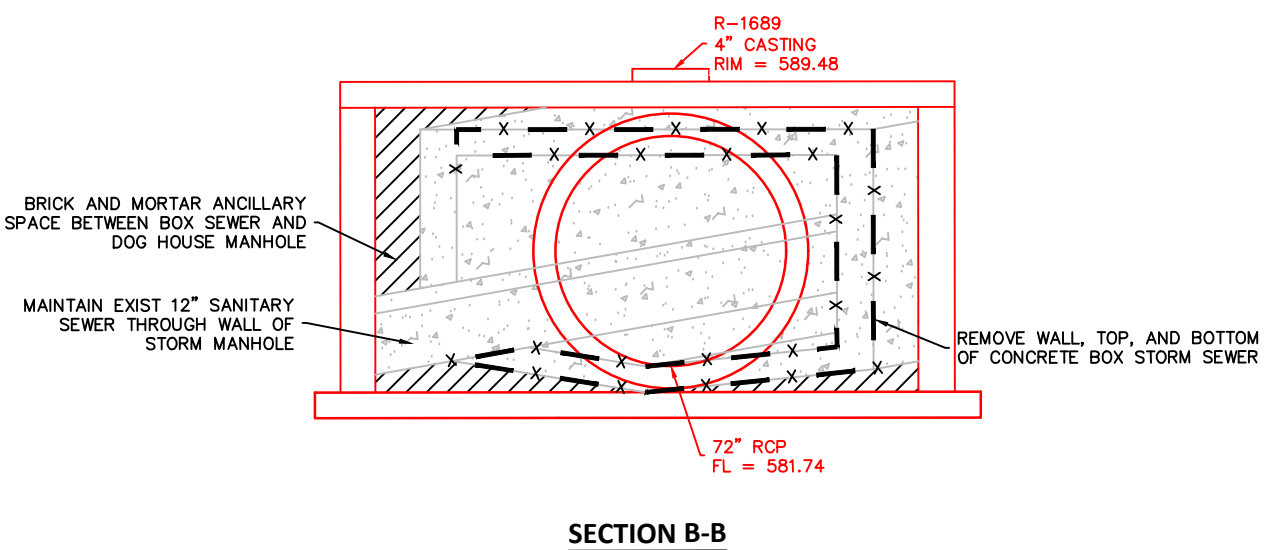
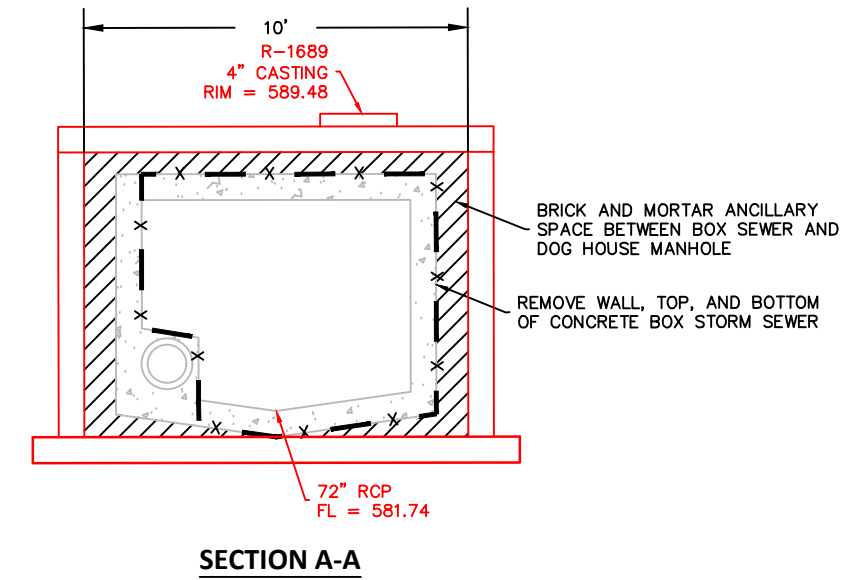
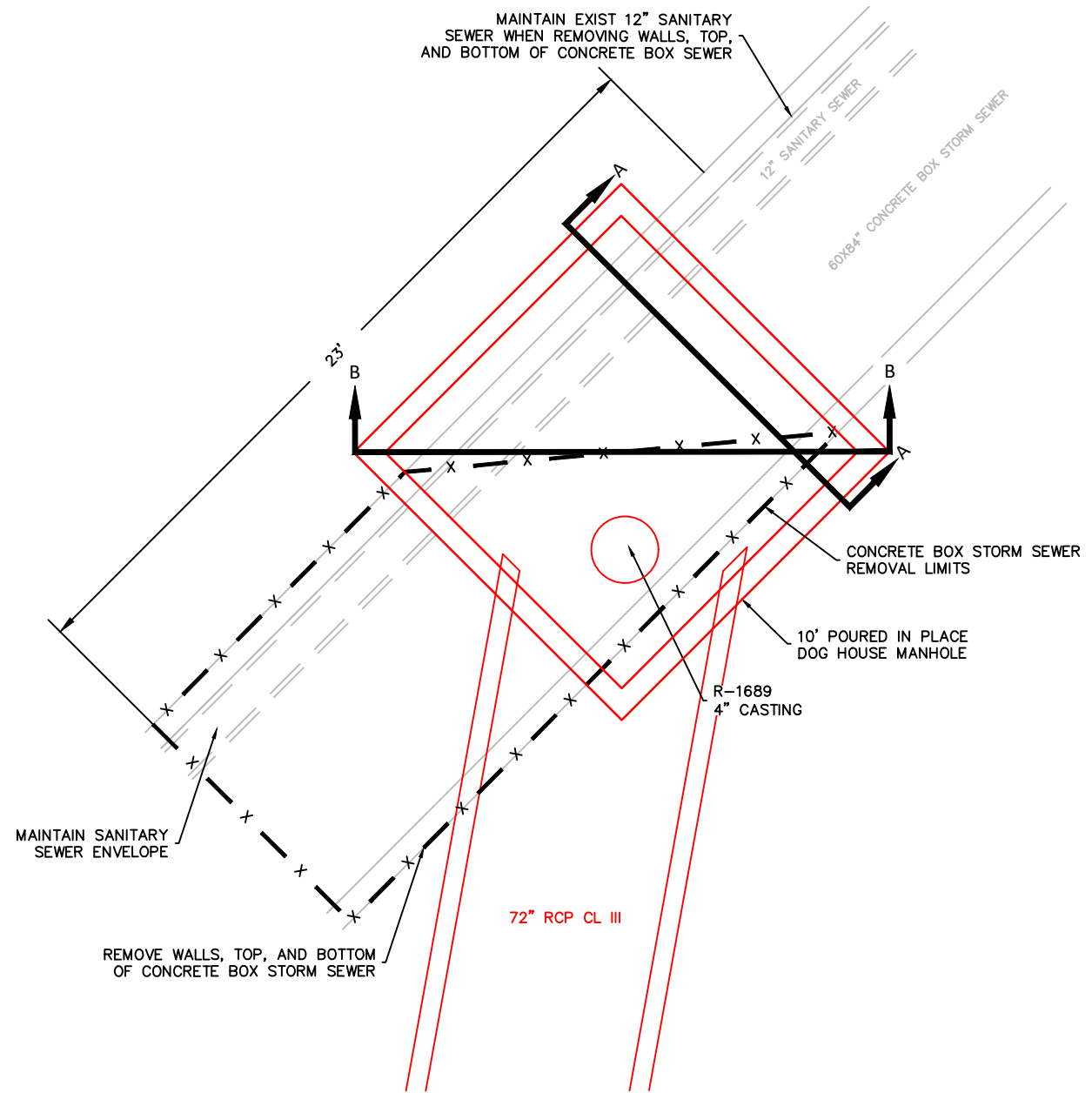
NAME:
COMMUNITY CENTER
UTILITY RELAY
PROJECT # 24-17

	BY	DATE
SURVEYED	KAD	06-2024
DRAWN	KAD	06-2024
DESIGNED	KAD	06-2024
CHECKED	CKK	07-2024

REVISIONS / ISSUES		
NO.	DATE	REMARKS

PAGE NO.
C402

X:\ENG\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

**COMMUNITY CENTER
STORM MANHOLE (64) DETAIL**

NAME:
COMMUNITY CENTER
UTILITY RELAY
PROJECT # 24-17

	BY	DATE
SURVEYED		
DRAWN	KAD	06-2024
DESIGNED	KAD	06-2024
CHECKED	CKK	07-2024


REVISIONS / ISSUES		
NO.	DATE	BY

PAGE NO.
C403

X:\ENG\Projects\City Projects\2024\Project 24-17 Community Center Utility Relay\1200-CAD\Comm Center Box Culvert_P&P_1.dwg



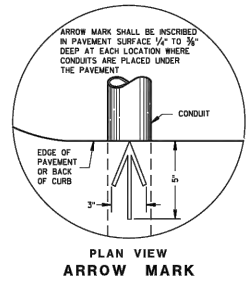
BENCHMARKS				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM (W41)	542153.732	84469.839	611.55	TOP NUT
BM (X5)	542057.306	84327.183	606.56	BRASS CAP
BM (W42)	541949.552	83926.136	602.27	TOP NUT
BM (W558)	542356.388	83848.291	594.04	TOP NUT


CITY OF DE PERE
 ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
 OFFICE 920-339-4061 FAX 920-339-4071

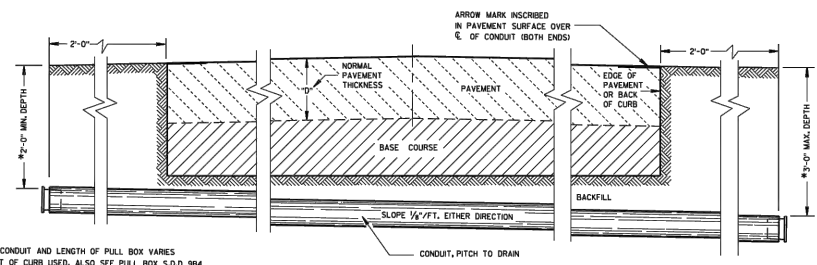
COMMUNITY CENTER
BENCHMARKS

NAME:
 COMMUNITY CENTER
 UTILITY RELAY
 PROJECT # 24-17

NO.	DATE	BY	REVISIONS / ISSUES	
			REMARKS	
SURVEYED	KAD/RJF	02-2024		
DRAWN	KAD	02-2024		
DESIGNED	KAD	02-2024		
CHECKED	CKK	02-2024		



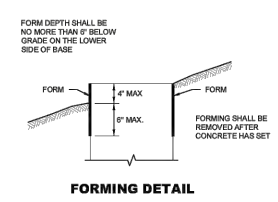
PLAN VIEW
ARROW MARK



SIDE ELEVATION
DETAIL FOR CONDUIT UNDER PAVED HIGHWAYS

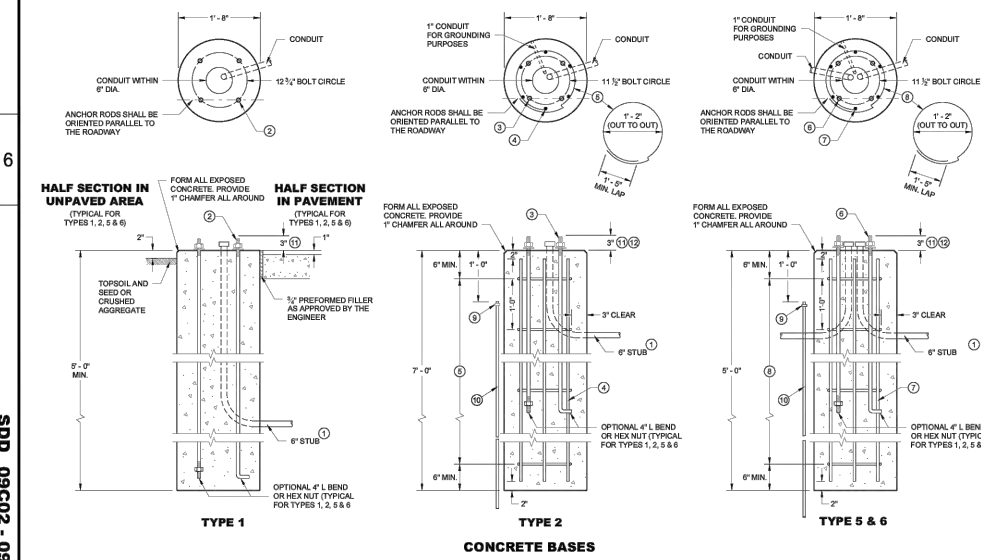
GENERAL NOTES
 DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
 METALLIC STANDARD SPECIFICATION 652.2.01 OR NONMETALLIC STANDARD SPECIFICATION 652.2.31 CONDUIT SHALL BE FURNISHED AND PLACED AS SHOWN.
 DEPTH OF CONDUIT INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES MINIMUM AND 36 INCHES MAXIMUM.
 DEPTH OF CONDUIT INSTALLED THAT IS NOT BELOW THE TRAVELED WAY SHALL BE 18 INCHES MINIMUM AND 36 INCHES MAXIMUM.
 ANY EXCEPTION TO THE MAXIMUM DEPTH SHALL BE ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER.
 THE TRENCH SHALL NOT BE BACKFILLED PRIOR TO INSPECTION OF THE CONDUIT.
 ALL METALLIC CONDUIT RACEWAY ENDS SHALL BE REAMED AND THREADED.
 ALL METALLIC CONDUIT IN WHICH WIRE OR CABLE IS TO BE INSTALLED SHALL BE BUSHED WITH APPROVED THREADED BUSHINGS BEFORE INSTALLATION OF THE WIRE OR CABLE.
 ALL METALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT TO BE INSTALLED SHALL BE CAPPED WITH THREADED PROTECTIVE CAPS, AS APPROVED BY THE ENGINEER.
 ALL NONMETALLIC CONDUIT SHALL BE CAPPED OR PLUGGED IMMEDIATELY AFTER INSTALLATION AND SHALL REMAIN CAPPED OR PLUGGED UNTIL WIRE/CABLES ARE INSTALLED.
 NONMETALLIC CONDUITS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED SHALL REMAIN CAPPED OR PLUGGED.
 BENDING OF PVC ELECTRICAL CONDUIT SHALL BE ACCOMPLISHED BY USING A BLANKET OR EMERSON TYPE TANK DESIGNED FOR THE PURPOSE OF BENDING PVC ELECTRICAL CONDUIT.
 ALL CUT ENDS SHALL BE TRIMMED INSIDE AND OUTSIDE TO REMOVE ALL ROUGH EDGES ON NONMETALLIC CONDUIT. (SEE NEC 347.5)
 WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ULL LISTED ADAPTER FITTINGS SHALL BE USED.
 PRIOR TO CONDUIT ACCEPTANCE, CONDUIT CAPS OR PLUGS SHALL BE REMOVED, AND THE CAPS, PLUGS AND CONDUIT ENDS SHALL BE THOROUGHLY CLEANED AND THEN THE CAPS OR PLUGS REINSTALLED TO ENSURE THAT THE CAPS OR PLUGS CAN BE EASILY REMOVED IN THE FUTURE.
 ALL CONDUIT BEING FURNISHED AND INSTALLED SHALL HAVE THE ULL LABEL FIRMLY ATTACHED.
 CONDUIT RUNS SHALL BE THE SAME SIZE OF CONDUIT FROM ONE END TO THE OTHER FROM PULL BOX TO PULL BOX OR JUNCTION BOX TO JUNCTION BOX OR BASE TO BASE, ETC.
 TRACER WIRE SHALL BE INSTALLED AS STATED IN THE STANDARD SPECIFICATION, ITEM 652.3.1.1.1
 ALL CONDUIT RUNS SHALL BE STRAIGHT WITHOUT BENDS FROM PULL BOX TO PULL BOX, PULL BOX TO BASE AND BASE TO BASE AS SHOWN ON THE PLANS.

CONDUIT
 STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED: [Signature] /S/ Ahmet Demirelik
 DATE: [Date] STATE ELECTRICAL ENGINEER
 DRAWN: [Name]



FORMING DETAIL

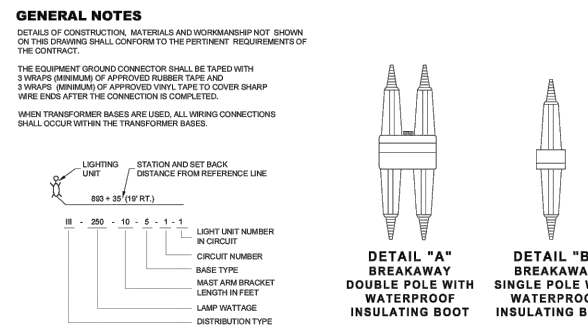
QUANTITY REQUIREMENTS	CONCRETE BASE TYPE 1	CONCRETE BASE TYPE 2	CONCRETE BASE TYPE 5 & 6
APPROX. CUBIC YARDS OF CONCRETE	0.40	0.57	0.40
LBS. OF HOOP BAR STEEL	NONE	23	18
LBS. OF VERTICAL BAR STEEL	NONE	60	18



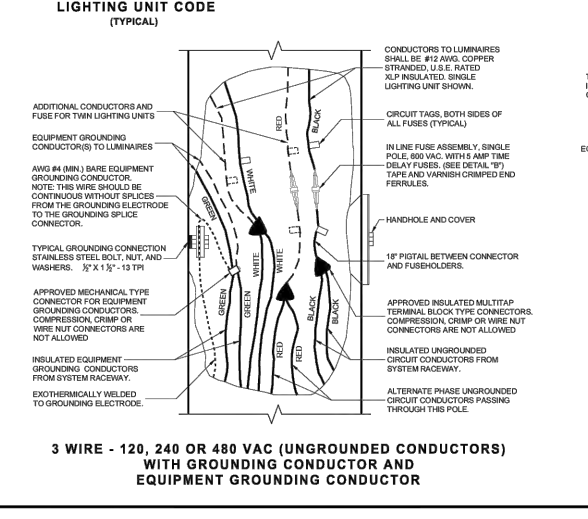
HALF SECTION IN UNPAVED AREA (TYPICAL FOR TYPES 1, 2, 5 & 6)
 HALF SECTION IN PAVEMENT (TYPICAL FOR TYPES 1, 2, 5 & 6)
 TYPE 1
 TYPE 2
 TYPE 5 & 6
CONCRETE BASES

GENERAL NOTES
 DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.
 BASES SHALL BE EXCAVATED BY USE OF A CIRCULAR AUGER.
 TOP SURFACES OF CONCRETE BASES SHALL BE TROWEL FINISHED SMOOTH AND LEVEL.
 CONDUIT SIZES AND LOCATIONS SHALL BE SHOWN ON THE PLANS.
 THE FINAL OR TERMINATING CONCRETE BASE IN A CONDUIT RUN SHALL HAVE A 6" EXIT STUB INSTALLED FOR FUTURE CABLE USE. THE EXIT STUB SHALL BE SIZED AS USED THROUGHOUT THE CONDUIT RUN & SHOWN AT THE ENTRANCE OF THE BASE.
 ENDS OF CONDUIT INSTALLED BELOW GRADE FOR FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NON-METALLIC.
 MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO SIX TIMES THE DIAMETER.
 CONDUIT HEIGHT ABOVE CONCRETE BASES SHALL BE 1 INCH. ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.
 ALL CONDUIT ENDS AT THE TOP OF CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NON-METALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT INSTALLED SHALL REMAIN CAPPED OR PLUGGED.
 BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF CONCRETE BASES BEFORE INSTALLATION.
 WHEN REQUIRED TO CONNECT NON-METALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS ULL LISTED FOR ELECTRICAL USE, SHALL BE USED.
 IF A BASE REQUIRES A DEEP FORM BECAUSE OF LOOSE DIRT OR FILL, THE FORM SHALL BE REMOVED BEFORE BACKFILLING AROUND THE BASE. BACKFILL SHALL BE TAMPED TIGHT AGAINST THE BARE CONCRETE BASE IN LAYERS OF 1 FOOT OR LESS.
 A NO. 4 AWG STRANDED COPPER EQUIPMENT GROUNDING CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO THE EQUIPMENT GROUNDING ELECTRODE (GROUND ROD) FOR TYPE 2, TYPE 5 AND TYPE 6 BASES.
 THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE FURNISHED AND INSTALLED TO ENTER ALL BASE TYPES THROUGH A 1 INCH CONDUIT INSTALLED FOR GROUNDING PURPOSES, LEAVING A 4 FOOT COIL OF WIRE ABOVE THE CONCRETE BASE. THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE NEATLY COILED AND THE COILS TIED TOGETHER.
 ANCHOR RODS SHALL BE THREADED 12" IN LENGTH ON EACH END OF THE ROD. ANCHOR RODS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 964.1.1 OF THE STANDARD SPECIFICATIONS.
 WASHERS AND LOCK WASHERS ARE REQUIRED ON ALL ANCHOR RODS.
 WHEN ANCHOR RODS USING THE ALTERNATE "L" BEND ARE FURNISHED, THE 4 INCH "L" BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE "L" BEND SHALL NOT BE THREADED.
 ANCHOR RODS SHALL BE INSTALLED WITH MISALIGNMENTS OF LESS THAN 1/40 FROM VERTICAL.
 WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. THE WIRES SHALL BE USED.
 BAR STEEL REINFORCEMENT SHALL BE COATED WITH POWDERED EPOXY RESIN IN ACCORDANCE WITH SECTION 505 OF THE STANDARD SPECIFICATIONS (LATEST EDITION).
 1) THE MINIMUM DEPTH OF CONDUIT EXTING THE CONCRETE BASE AND INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES. THE MINIMUM DEPTH OF CONDUIT EXTING THE CONCRETE BASE THAT IS NOT INSTALLED BELOW THE TRAVELED WAY SHALL BE 18 INCHES. THE MAXIMUM DEPTH OF ALL CONDUIT SHALL BE 36 INCHES EXCEPT WITH WRITTEN APPROVAL OF THE ENGINEER.
 2) 4" DIA. X 3'-0" ANCHOR RODS.
 3) 6" DIA. X 3'-0" ANCHOR RODS.
 4) NO. 6 X 6'-0" BAR STEEL REINFORCEMENT.
 5) NO. 4 X 6'-0" BAR STEEL REINFORCEMENT @ 1'-0" C-C.
 6) NO. 4 X 6'-0" BAR STEEL REINFORCEMENT @ 1'-0" C-C.
 7) NO. 4 X 6'-0" BAR STEEL REINFORCEMENT.
 8) NO. 4 X 6'-0" BAR STEEL REINFORCEMENT @ 1'-0" C-C.
 9) EXOTHERMIC CONNECTION TO EQUIPMENT GROUNDING CONDUCTOR.
 10) 1/2" DIA. X 6'-0" COPPER LAD EQUIPMENT GROUNDING ELECTRODE REQUIRED.
 11) ANY ANCHOR ROD PROJECTION SHORTER THAN 2 1/2" OR LONGER THAN 3" SHALL REQUIRE THE BASE TO BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.
 12) FOR NON-BREAKAWAY INSTALLATIONS, 4 1/2" ANCHOR ROD PROJECTION WITH THE USE OF LEVELING NUTS. RODENT SCREEN REQUIRED.

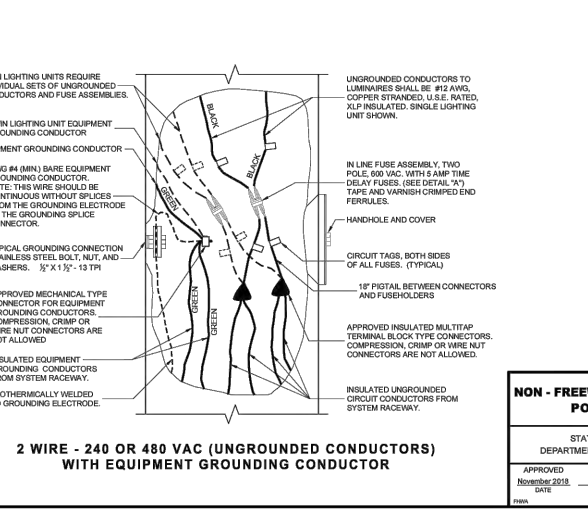
CONCRETE BASES
 TYPES 1, 2, 5, & 6
 STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED: [Signature] /S/ Ahmet Demirelik
 DATE: [Date] STATE ELECTRICAL ENGINEER
 DRAWN: [Name]



TYPICAL GROUNDING CONNECTIONS
 NUT, BOLT AND WASHERS SHALL BE STAINLESS STEEL

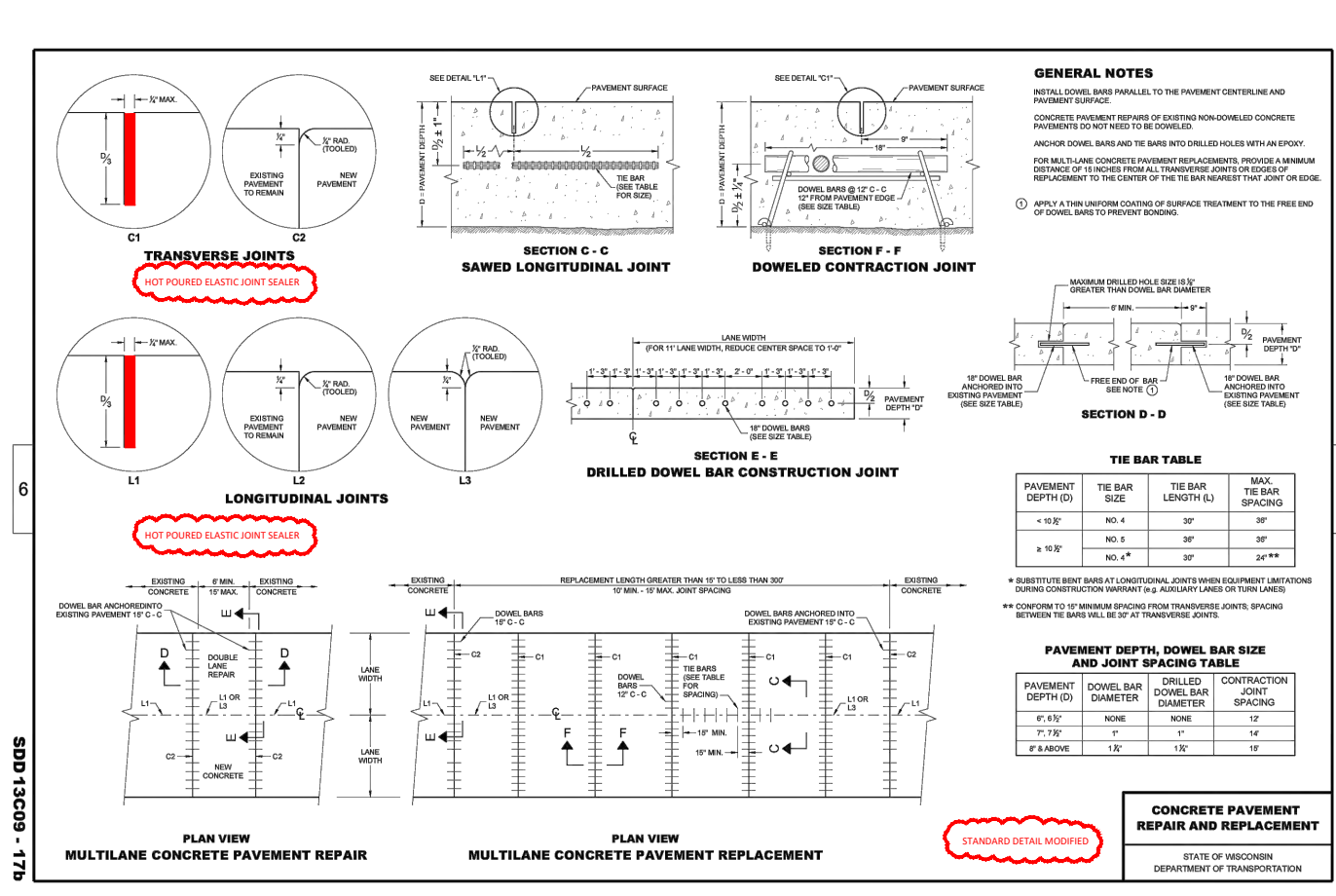
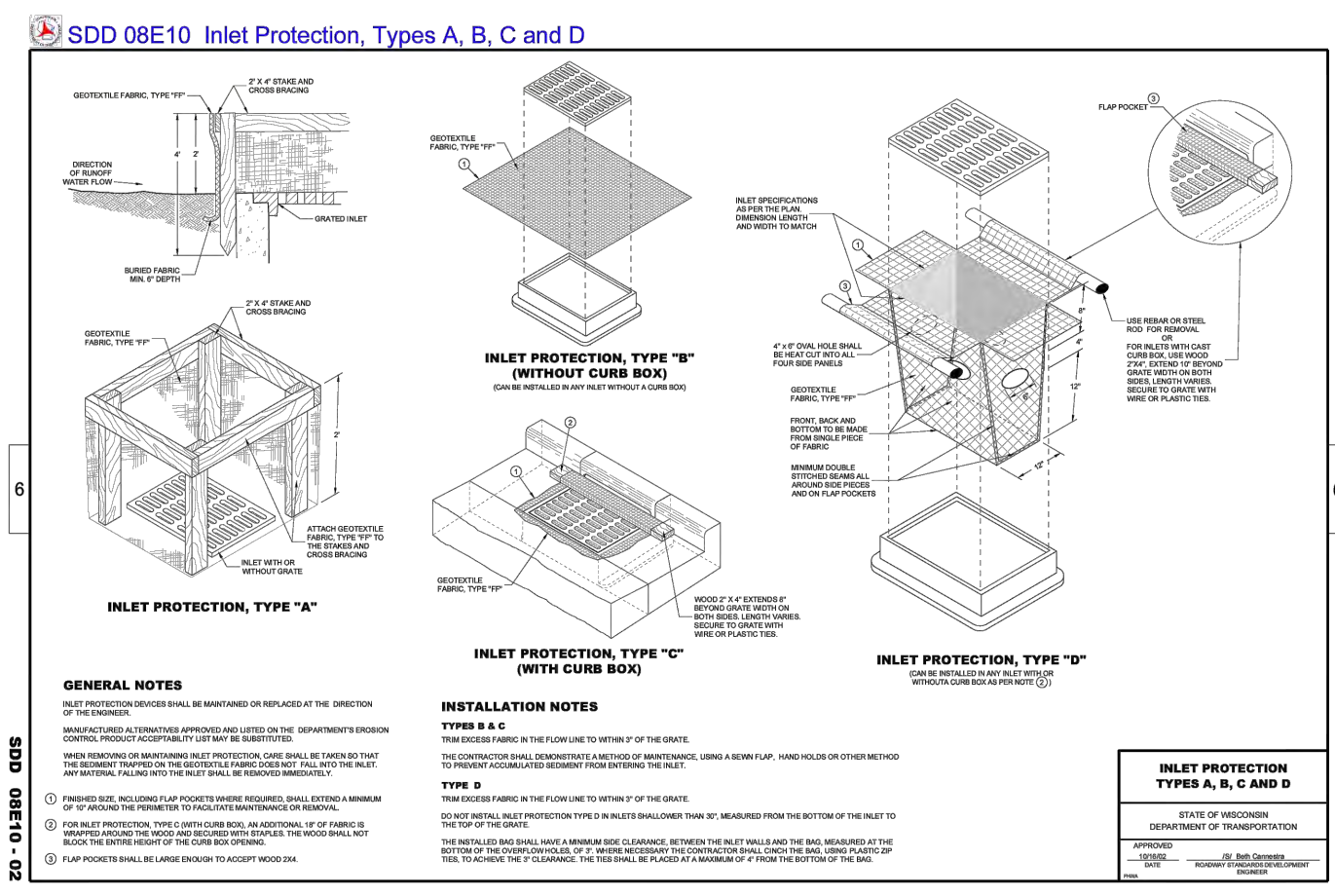
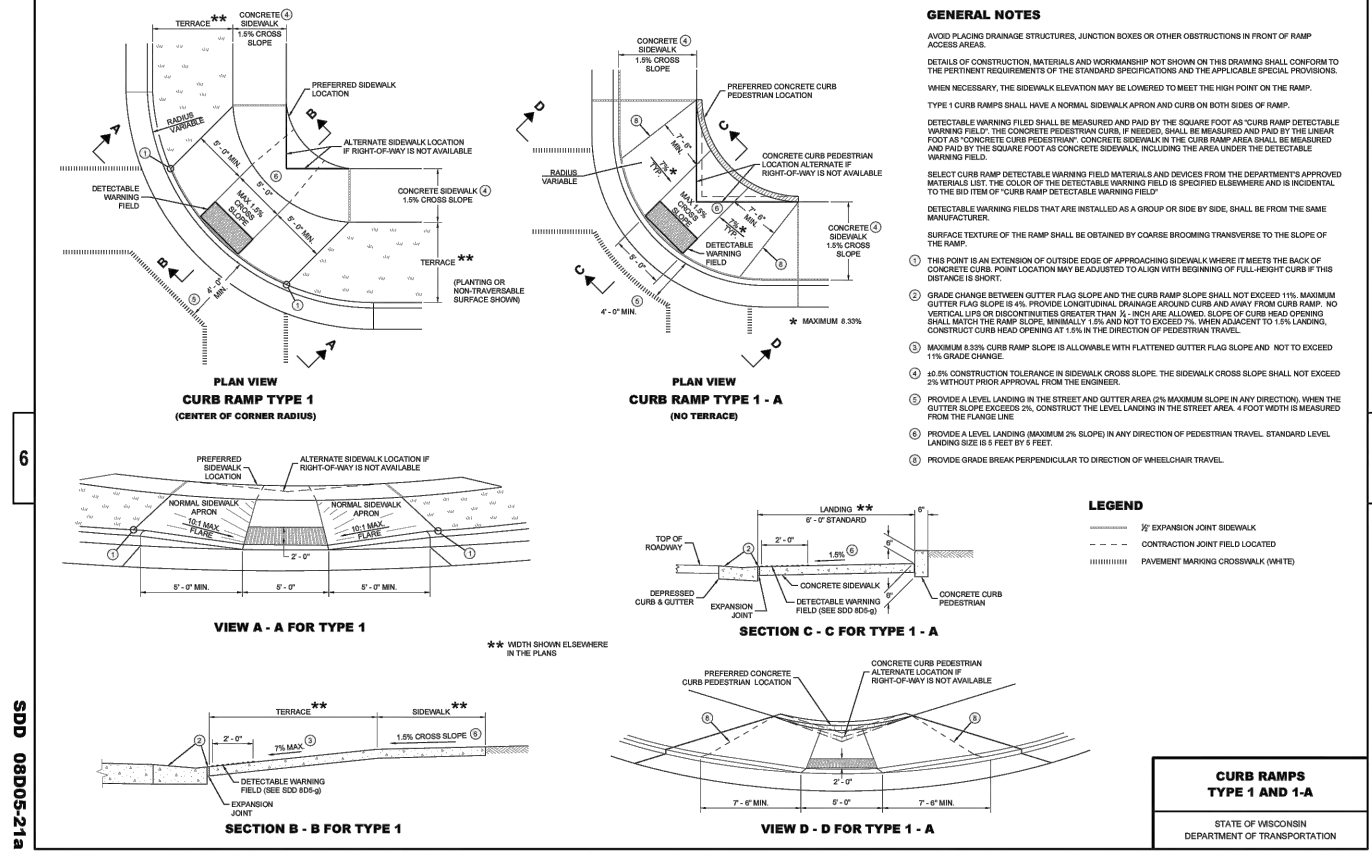
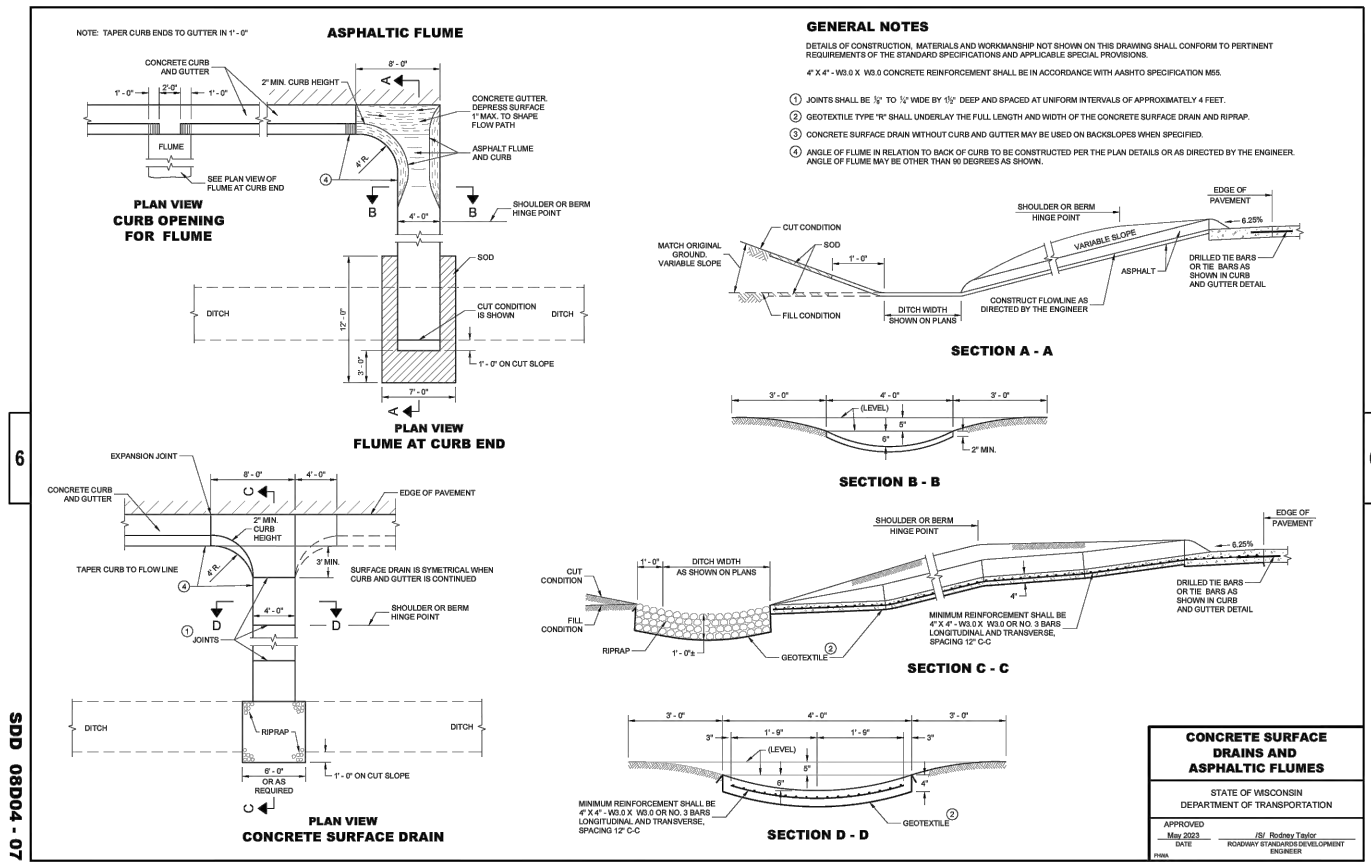


3 WIRE - 120, 240 OR 480 VAC (UNGROUND CONDUCTORS) WITH GROUNDING CONDUCTOR AND EQUIPMENT GROUNDING CONDUCTOR



2 WIRE - 240 OR 480 VAC (UNGROUND CONDUCTORS) WITH EQUIPMENT GROUNDING CONDUCTOR

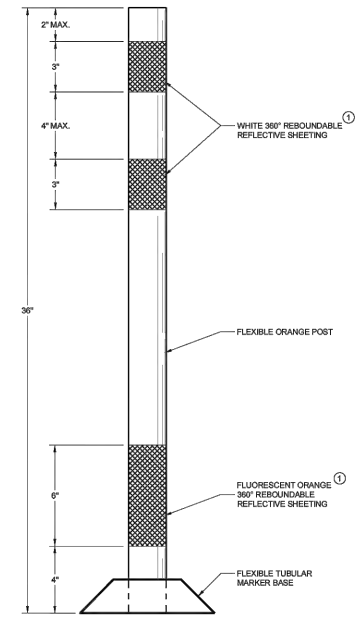
NON-FREEWAY LIGHTING UNIT POLE WIRING
 STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED: [Signature] /S/ Ahmet Demirelik
 DATE: [Date] STATE ELECTRICAL ENGINEER
 DRAWN: [Name]



GENERAL NOTES

DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.
 SURFACE MOUNTED BASES SHALL BE FURNISHED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS TO BE COMPATIBLE WITH FLEXIBLE TUBULAR MARKER POSTS TO A SIZE AND SHAPE THAT WILL PROVIDE A STABLE POST FOUNDATION WHEN SECURED TO THE PAVEMENT.
 THE ASPHALTIC ADHESIVE OR BUTYL PAD FURNISHED SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, UNLESS DIRECTED BY THE ENGINEER TO USE BOLTS.

- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.



FLEXIBLE TUBULAR MARKER POST

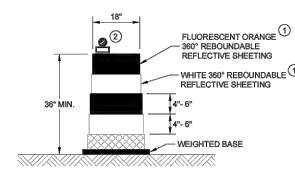
CHANNELIZING DEVICES FLEXIBLE TUBULAR MARKER POST

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED
 November 2022 /S/ Andrew Heitke
 DATE WORK ZONE ENGINEER

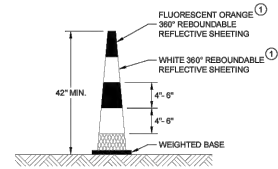
SDD 15C11 - 10a

GENERAL NOTES

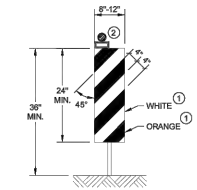
- ① REFLECTIVE SHEETING SHALL FOLLOW THE REQUIREMENTS IN THE APPROVED PRODUCTS LISTING FOR SIGN SHEETING.
- ② LOCATION OF WARNING LIGHTS WHEN SHOWN ON THE PLAN.



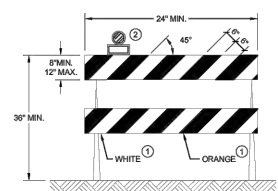
DRUM



42" CONE

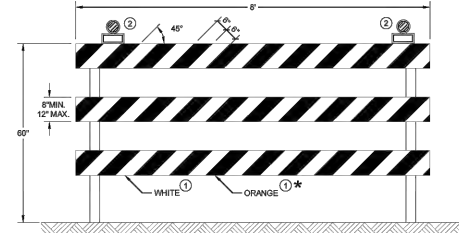


VERTICAL PANEL



TYPE II BARRICADE

FOR RAILS LESS THAN 36" LONG, 4" WIDE STRIPES MAY BE USED. ALL STRIPES SHALL SLOPE DOWNWARD TO THE TRAFFIC SIDE FOR CHANNELIZATION.



TYPE III BARRICADE

IF SIGN MOUNTED, DO NOT COVER MORE THAN 50% OF THE TOP TWO RAILS OR 33% OF THE TOTAL AREA OF THE THREE RAILS.
 * IF USED FOR A PERMANENT APPLICATION USE RED SHEETING.

CHANNELIZING DEVICES DRUMS, CONES, BARRICADES AND VERTICAL PANELS

STATE OF WISCONSIN
 DEPARTMENT OF TRANSPORTATION
 APPROVED
 November 2022 /S/ Andrew Heitke
 DATE WORK ZONE ENGINEER

SDD 15C11 - 10b

If using 42" cones in tangent sections, spacing is G/2.
 R is manufacturer specific roll ahead distances
 Number of Channelizing Devices Needed in ().

Non-Freeway/Expressway OR MULTILANE DIVIDED 45 and under

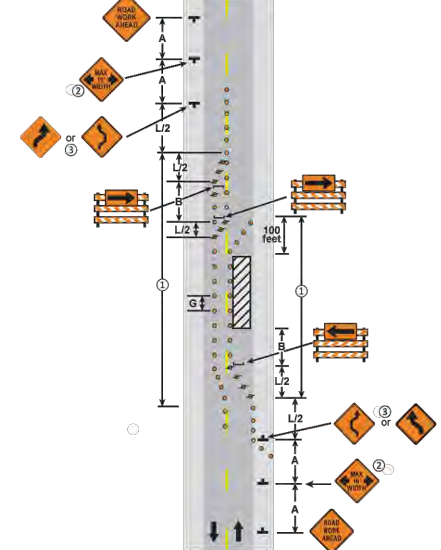
Posted Speed Limit Prior to Work Starting (mph)	Advance Warning Sign Spacing (A) feet	Decision Sight Distance (D) feet	Taper Length (12 ft lane) (L1) feet	Shifting Taper (12 ft lane) (L2) feet	Buffer Space (B) feet
0-25	200	550	125 (5)	85 (3)	55 (1)
30	200	550	180 (8)	90 (4)	85 (2)
35	G=2R	350	700	245 (10)	125 (5)
40	350	700	320 (13)	160 (7)	170 (4)
45	500	900	540 (11)	270 (5)	220 (2)
50	G=50ft	500	900	600 (12)	300 (6)
55	500	1200	660 (13)	330 (7)	335 (3)

Multilane divided 50 mph and greater

Posted Speed Limit Prior to Work Starting (mph)	(X) Distance from Beginning of Taper	(Y) Distance from Lane Closed Sign to Road Work Ahead Sign	(Z) Distance from Lane Closed Sign to Road Work Ahead Sign	Taper Length (12 ft lane) (L1) feet	Shifting Taper (12 ft lane) (L2) feet	Buffer Space (B) feet	
50	G=50ft	1000	1600	2600	600 (12)	300 (6)	
55					660 (13)	330 (7)	500 min
60					720 (14)	360 (7)	+ 800 max
65					780 (15)	390 (8)	(5-8)
70					840 (16)	420 (8)	

Temporary Traffic Control Distance Charts Figure 9

- NOTES:**
- ① Parking and stopping should be prohibited along the work area and tapers.
 - ② When available width is less than 16 feet, a Max Width (W12-S2) sign should be used with a posted width 1 foot less than available width.
 - ③ If tangent length of activity area is 600 feet or less, use the Double Reverse Curve sign.
 - 4. END ROAD WORK sign should be placed 500 feet past work area.



WORK SPACE OCCUPIES ONE HALF OF ROAD TWO-LANE, TWO-WAY ROAD 3 DAYS or LESS LAYOUT 25



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
 OFFICE 920-339-4061 FAX 920-339-4071

COMMUNITY CENTER TRAFFIC CONTROL DETAILS

NAME: COMMUNITY CENTER UTILITY RELAY PROJECT # 24-17

	BY	DATE	REVISIONS / ISSUES	
			NO.	DATE
SURVEYED				
DRAWN	KAD	02-2024		
DESIGNED				
CHECKED	CKK	02-2024		

PAGE NO. C502