CITY OF DE PERE

PROJECT
19-18

PROSPER STREET AND ENTERPRISE DRIVE RECONSTRUCTION AND UTILITY RELAY

BID DATE:
MARCH 28, 2019
@ 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.de-pere.org. On the homepage, click on the City Departments tab at the top, then click on Public Works, then Engineering, then Construction Projects, then 2019 Construction Projects. Download cost is $15 for each contract. Bidding documents may be viewed on the QuestCDN website or at the Municipal Service Center.

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.

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MARCH 7, 2019 – MARCH 14, 2019

CITY OF DE PERE

ADVERTISEMENT TO BID

PROJECT 19-18

PROSPER STREET AND ENTERPRISE DRIVE RECONSTRUCTION AND UTILITY RELAY

Sealed proposals will be received by the Board of Public Works of the City of De Pere at the Municipal Service Center, 925 South Sixth Street, De Pere, Wisconsin 54115, until 1:00 P.M., Thursday, March 28, 2019, at which time they will be publicly opened and read aloud.

Project 19-18 for which proposals are being sought includes the following approximate quantities:

- 80 LF New and Relay Storm Sewer (12-inch to 48-inch) and Associated Appurtenances
- 2,300 LF Relay Water Main (12-inch to 16-inch) and Associated Appurtenances
- Relay Storm Laterals, Relay Sanitary Laterals and Relay Water Services
- 11,800 SY New (9-Inch or 8-Inch) Concrete Pavement with Integral Curb, Driveway and Sidewalks
- 12,400 SY Concrete and Asphaltic Concrete Pavement Removals
- 125 SY Asphaltic Patching of Driveways
- Restoration

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 $15 by inputting Quest project #6196815 on Quest's Project Search page. The QuestCDN website can also be accessed through the City website at www.de-pere.org. On the homepage, click on the City Departments tab at the top, then click on Public Works, then Engineering, then Construction Projects, then 2019 Construction Projects.

Each proposal shall be accompanied by a certified check or 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 check or bid bond shall be forfeited to the City of De Pere as liquidated damages.

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 P.M., Monday, March 25, 2019. Prospective bidders who have previously submitted such forms subsequent to January 1, 2019 will not be required to separately submit such form 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 7th day of March, 2019.

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

Project 19-18

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 or Invitation 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. In preparation of the Plans and Specifications, Engineer relied upon the following reports of explorations and tests of subsurface conditions at the Site:
      a. Subsurface Exploration and Subgrade Analysis, Proposed Roadway Reconstruction and Utility Relay Charles Street and Enterprise Drive, De Pere, Wisconsin, by Intertek PSI.
      b. Geotechnical Engineering Report for 2019 Construction Design for Prosper Street by ECS Midwest, LLC

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 submitted 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 drawing 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 5 percent 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.

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 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 office 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 enclosed in a plainly marked package with the Project title (and, if applicable, designated portion of the Project for which the Bid is submitted), name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed to City of De Pere, Municipal Service Center, 925 S. Sixth Street, De Pere, WI 54115. Electronically transmitted Bids will not 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 at the time and place indicated in the Advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

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 10 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner. Within ten 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 19-18

This bid, submitted by the undersigned Bidder to the City of De Pere, in accordance with the Advertisement or Invitation to Bid, which will be received until 1:00 P.M., Thursday March 28, 2019 is to furnish and deliver all materials, and to perform and do all work on the project designated, by November 1, 2019.

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:

Addendum No.	Addendum Date
_____	_____
_____	_____

BASIS OF BID:

Bidder will complete the Work in accordance with the Contract documents for the following prices (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: $_____

TOTAL ALTERNATE PRICE: $_____

TOTAL BASE BID PLUS ALTERNATE PRICE: $_____

The City reserves the right to choose the Base Bid or the Base Bid plus Alternate Price.

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)
B.	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)

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 venture 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 19-18
BID SCHEDULE – UNIT PRICE

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SANITARY SEWER					
SS-01	Remove and Relay 6" or 4" PVC Sanitary Lateral	LF	320	$	$
SS-02	Provide 6" or 4" Saddle to Existing Sanitary Sewer	EA	8	$	$
SS-03	Dig Down to Verify Lateral Material and Size	EA	8	$	$
STORM SEWER					
ST-01	Remove and Replace 12” PVC or RCP (Class III) Storm Sewer	LF	50	$	$
ST-02	Remove and Replace 4’ Diameter Storm Manhole	VF	8	$	$
ST-03	Remove and Replace Type B Inlet	EA	3	$	$
ST-04	Dig Down and Pour Crown on Storm Sewer Utility Hit (48” Storm Sewer)	EA	3	$	$
WATER MAIN					
W-01	Provide 16" PVC Water Main (Granular Backfill)	LF	2,200	$	$
W-02	Provide 16" PVC Water Main (Natural Backfill)	LF	150	$	$
W-03	Provide 12” PVC Water Main (Granular Backfill)	LF	60	$	$
W-04	Provide 10" PVC Water Main for Water Service	LF	25	$	$
W-05	Provide 8" PVC Water Main for Water Service	LF	60	$	$
W-06	Provide 6" PVC Hydrant Lead or Water Service	LF	120	$	$

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
WATER MAIN CONTINUED					
W-07	Provide 2" Corporation with Plug/Saddle with 2" HDPE	EA	2	$	$
W-08	Provide 1.5” HDPE Water Service	LF	25	$	$
W-09	Provide 1.5” Corporation and Curb Stop	EA	1	$	$
W-10	Provide 1” HDPE Water Service	LF	320	$	$
W-11	Provide 1” Corporation and Curb Stop	EA	10	$	$
W-12	Provide 16" Butterfly Valve	EA	3	$	$
W-13	Provide 10" Gate Valve	EA	1	$	$
W-14	Provide 8" Gate Valve	EA	1	$	$
W-15	Provide 6" Gate Valve	EA	6	$	$
W-16	Provide Hydrant 7.0' Bury	EA	5	$	$
W-17	Provide Connection to Existing Water Main	EA	4	$	$
W-18	Provide Watermain 1/2 Offset	EA	1	$	$
W-19	Dig Down and Verify Water Lateral Size and Material	EA	13	$	$
W-20	Abandon/Remove Water Main and Appurtenances	LS	1	$	$
STREET AND DRAINAGE					
SD-01	Unclassified Excavation	CY	5,300	$	$
SD-02	Provide 1 1/4" Crushed Aggregate Base Course	TON	8,500	$	$

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
STREET AND DRAINAGE CONTINUED					
SD-03	Provide Asphalt Patch (Driveway)	SY	90	$	$
SD-04	Provide 24" Integral Curb	LF	4,500	$	$
SD-05	Remove Concrete Pavement with integral curb	SY	11,500	$	$
SD-06	Remove Asphaltic Concrete Pavement (Driveway)	SY	775	$	$
SD-07	Remove Concrete Pavement (Driveway)	SY	240	$	$
SD-08	Provide 9-Inch Doweled Concrete Pavement with Integral Curb and Gutter	SY	8,200	$	$
SD-09	Provide 9-Inch Doweled Concrete Pavement with Integral Curb and Gutter (HES-3 Day)	SY	1,450	$	$
SD-10	Provide 8-Inch Concrete Driveway and Sidewalk	SY	1,300	$	$
SD-11	Provide #4 Reinforcement Bars for Curb and Sidewalk	LF	100	$	$
SD-12	Drilled Tie Bars	EA	50		
SD-13	Landscaping – Topsoil, Seed, Fertilizer and Mulch	SY	2,500	$	$
SPECIAL CONSTRUCTION					
SC-01	Pipe Foundation Stabilization	CY	100	$	$
SC-02	Inlet Protection	EA	15	$	$
SC-03	Tracking Pad	EA	2	$	$
SC-04	Adjust Inlet	EA	6	$	$
SC-05	Adjust Manhole	EA	2	$	$

ITEM	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT BID
SPECIAL CONSTRUCTION CONTINUED					
SC-06	Reconstruct Manhole	VF	4	$	$
SC-07	Traffic Control	LS	1	$	$
SC-08	Traffic Control Detour Route	LS	1	$	$
SC-09	Salvage Fence and Replace	LS	1	$	$
				BASE BID TOTAL	$

ALTERNATE BID SCHEDULE					
ITEM	**ITEM DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT BID**
SPECIAL CONSTRUCTION ALTERNATE BID					
SC-10	Remove Existing Light Pole Base	EA	13	$	$
SC-11	Remove Existing Light Pole (Salvage to City)	EA	13	$	$
SC-12	Conduit Rigid Nonmetallic Schedule 40, 2-Inch	LF	4,000	$	$
SC-13	Conduit Bored, 2-Inch	LF	500	$	$
SC-14	Pull Box 24x42 Inch	EA	5	$	$
SC-15	Concrete Base, Type 5	EA	13	$	$
SC-16	Concrete Control Cabinet Base, Type L24	EA	1	$	$
SC-17	Electrical Wire Lighting 12 AWG	LF	4,500	$	$
SC-18	Electrical Wire Lighting 4 AWG	LF	6,000	$	$
SC-19	Electrical Service Meter Breaker Pedestal	LS	1	$	$
SC-20	Transformer Base Breakaway 11 1/2 Bolt Circle, Anodized Black with Factory Applied Black Finish	EA	13	$	$
SC-21	Poles Type 5-Aluminium, Anodized Black	EA	13	$	$
SC-22	Luminaire Arms Single Member 4-1/2 Inch Clamp, 8-foot, Anodized Black	EA	13	$	$
SC-23	Luminaires Utility LED C	EA	13	$	$
SC-24	Lighting Control Cabinet, 120/240 24-inch	EA	1	$	$
				ALTERNATE BID TOTAL	$

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 19-18 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
Water Main (PVC)		
Valves		
Hydrants		
Storm Sewer (PVC / RCP)		
Manholes		
Inlets / Catch Basins		
Anodized Aluminum Light Poles		
Lighting Control Cabinet		

SECTION 00 43 36

TABULATION OF SUBCONTRACTORS

The following information is submitted which gives the name, business address, and portion of work for each subcontractor that will be used in the work if the bidder is awarded the contract, and no subcontractor doing work in excess of one-half of one percent of the total amount of the bid and who is not listed will be used without the written approval of the Engineer. Additional numbered pages outlining this portion of the proposal may be attached to this page.

PORTION OF WORK	BUSINESS NAME	BUSINESS ADDRESS
Concrete Work		
Asphaltic Concrete Paving		
Utility Work		
Electrical / Lighting		
Restoration / Landscaping		

SECTION 00 51 00
NOTICE OF AWARD

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

Project Description: 19-18 Prosper Street and Enterprise Drive Reconstruction and 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 March 7, 2019 and March 14, 2019.

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 __th day of _____2019.

_____
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 Project 19-18 Prosper Street and Enterprise Drive Reconstruction and 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 March 7, 2019 and March 14, 2019.

(b) Drawings designated for 19-18 Prosper Street and Enterprise Drive Reconstruction and Utility Relay dated March 7, 2019.

(c) City of De Pere 2019 Construction Specifications.

(d) Special Provisions dated March 7, 2019.

(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 22)($) 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 day 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 0052-13-2, 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).
   e. Specifications as listed in the table of contents of the Project Manual.
   f. Drawings consisting of ___ sheets with each sheet bearing the following general title: ___[or] the Drawings listed on attached sheet index.
   g. Addenda (numbers ___ to ___ inclusive), dated_____.
   h. Exhibits to this Agreement (enumerated as follows):
      1) Contractor's Bid (pages 00 41 13-1 to 00 41 13-3, inclusive).
      2) Bid Schedule – Unit Prices (Pages 00 41 43-1).
      3) Proposed Products Form (Page 00 43 33-1)
      4) Tabulation of Subcontractors (page 00 43 36-1).
      5) Documentation submitted by Contractor prior to Notice of Award (00 51 00-1)

i. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
   1) Notice to Proceed (Page 00 55 00-1).
   2) Change Orders.

2. The documents listed in Paragraph (a) Contents, are attached to this Agreement (except as expressly noted otherwise above).

3. There are no Contract Documents other than those listed above in this Article IV.

IN WITNESS WHEREOF, the parties hereto have executed this Contract, the day and year first written above.

_____ _____
(WITNESS) (CONTRACTOR) (SEAL)

_____ BY:_____
(WITNESS)

_____
(TITLE)

BY: _____

_____
(TITLE)

CITY OF DE PERE (SEAL)

Approved as to Form By: _____ (City Attorney)

Sufficient funds are available to provide for the payment of this obligation.

_____
(COMPTROLLER)

BY:_____ BY:_____
(MAYOR) (CLERK-TREASURER)

SECTION 00 55 00
NOTICE TO PROCEED

Date: _____

(CONTRACTOR NAME)
(ADDRESS)
(ADDRESS)

PROJECT: 19-18 Prosper Street and Enterprise Drive Reconstruction and 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 owner, 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 19-18 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 sub-contractor 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.

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)

_____ _____
(WITNESS) (SURETY)

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 19-18, 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)

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		
Number	Additions	Deductions
Total	$0.00	$0.00

NET CHANGE BY CHANGE ORDERS:	$0.00

1.	ORIGINAL CONTRACT PRICE:.....	
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 (5% up to 50% of Contract or 2.5% of 100% of Contract	$0.00
6.	AMOUNT ELIGIBLE TO DATE (Line 4 minus 5).....	$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 Applicaions 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 covere d by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by the Applicaton 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
   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, 2019 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 it 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. Enterprise Drive from Prosper Street to the south 800 feet.
      b. Prosper Street from Enterprise Drive to S. Broadway Street (CTH PP)
   2. Work will be performed under the following prime contract:
      a. Project 19-18 Prosper Street and Enterprise Drive Reconstruction and Utility Relay.

B. The Work includes:
   1. Water main and associated appurtenances relay.
   2. Concrete curb and gutter slip form and hand poured gaps.
   3. Concrete pavement, driveway aprons, and sidewalk removal and repairs.
   4. Remove asphaltic concrete and concrete pavement.
   5. Unclassified excavation.
   6. Asphaltic concrete paving.
   7. Terrace restoration.
   8. Erosion control.
   9. Sanitary sewer and storm sewer lateral replacement.
   10. Storm sewer inlet and inlet lead removal and replacement.
   11. Water main diversion.
   12. Temporary water main connection.
   13. Pavement marking.
   14. Traffic control and detour installation.

1.4 WORK SEQUENCE

A. Conduct construction activities to maintain access to businesses and residences throughout construction.

B. Topsoil, seed, and mulch shall be completed prior to asphaltic concrete pavement placement.

C. This project will go to the Board of Public Works on April 8, 2019 and Common Council on April 16, 2019 for consideration of award.

D. All work under this project shall be completed by Friday, November 1, 2019.

E. All water main tracer wire is to be tested prior to paving.

F. The allowed time for Project 19-18 Prosper Street and Enterprise Drive Reconstruction and Utility Relay from beginning of construction of work to the substantial completion is 151 calendar days. Substantial completion is defined as having the street paved, pavement markings down, and driveway and terrace restoration completed.

G. Prior to work start on Enterprise Drive and Prosper Street, dig down and verify the following water and sanitary sewer laterals to verify the existing pipe size, material and depth.

Address	Water Laterals	Sanitary Sewer Laterals
1900 Enterprise Drive	1	1
801 Prosper Street	1	1
809 Prosper Street	1	1
815 Prosper Street	1	1
825 Prosper Street	1	1
830 Prosper Street	3	2
845 Prosper Street	4	1
850 Prosper Street	1	1

H. The water main installation on Prosper Street and Enterprise was designed to be constructed in the following sequence:
   1. Water dig down and cap the existing water main on Prosper Street at CTH PP. Start constructing the new 16-inch water main starting at CTH PP working west. Construct the water main to the hydrant at the northeast corner of the intersection of Prosper Street and Enterprise Drive. All newly installed water mains shall be tested and each property shall be switched over to the new water main prior to any further work to continue.
   2. Once all the properties are on the new water main on Prosper Street, dig down, disconnect and cap the water main at the intersection of Prosper Street and Enterprise Drive. Lay the new water main at this intersection and through the disconnected, existing water main. Properties to the south of the intersection shall be fed from the south end of the project.
   3. Lay the water main on Enterprise Drive to the south as normal.

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. The City of De Pere Park Department will trim trees in conflict with construction if the City receives advanced notification. Questions regarding trees or landscaping that is bid as part of this contract can be directed to the Engineer.

B. 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, Shea Gorzelanczyk, (sg2528@att.com) (920-433-4250)

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. Level3 (Mi-Tech Services), Chris Kraus, (ckraus@mi-tech.us) (414-550-6201)

1.9 MISCELLANEOUS PROVISIONS

A. Notification to businesses – The Contractor shall individually notify all businesses 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. Maintain access to properties during construction, excluding times when utility work is occurring directly in front of the drive. When crossing the road to reconnect services, a flagger must be used. Any material placed to maintain access will not be paid.

C. Maintain mail service throughout construction.

D. Recycled crushed concrete will be allowed for the base course on this project. The City of De Pere Compost Site (655 Rockland Road) may be used for the stockpiling and crushing of removed concrete pavement to be recycled on this project. After stockpiling and crushing occurs, all excess waste must be removed from the compost site (e.g. metal reinforcement), and the site must be restored with topsoil, seed and mulch to match preexisting conditions. This restoration will not be paid. This recycled stone and any additional stone required will be paid for under the Provide 1-1/4" Crushed Aggregate Base Course Item.

E. Any additional stone required to maintain access to businesses, as called out on the plan will be paid for under the Provide 1-1/4" Crushed Aggregate Base Course Item.

F. Provide a traffic plan for the following:
   1. The restriction of Enterprise Drive to southbound only traffic only for the duration of the utility work and concrete work on Enterprise Drive. The traffic control plan should account for multiple phases of paving to allow access to the businesses along Enterprise Drive.
   2. Prosper Street will maintain two-way traffic throughout the duration of the project.

G. Ingress and egress to the site of work for delivery of materials, hauling of excavation, daily construction activities and all vehicular traffic shall be as follows:
   1. Enterprise Drive shall be accessed from Heritage Road or Prosper Street.
   2. Prosper Street shall be accessed from Enterprise Drive or S. Broadway Street (CTH PP)
   3. Access to the City of De Pere Compost Site shall be via Enterprise Drive to Rockland Road.

H. Each business should be contacted to determine the optimal time to conduct their final water connection to maintain operational hours of the business to the best of the

contractor's ability. Weekends or nighttime work may be needed to facilitate final water connections.

1. The business at 830 Prosper Street will require that water only be turned off on Saturday after 2:00 PM or anytime on Sunday.

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: Bid Item No.
   1. Sanitary Sewer Laterals SS-01
   2. Sanitary Sewer Service Branches SS-02
   3. Dig Down to Verify Lateral Material and Size SS-03

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 provide 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 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.

1.4 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.

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

C. The unit of measurement for payment is each.

1.5 VERIFY LATERAL MATERIAL AND SIZE

A. The unit price for Verify Lateral Material and Size work includes:
   1. General Work Items of Article 1.2.
   2. Televise or excavate down to existing sanitary sewer lateral to expose the existing lateral to verify the lateral's material, size, and depth.
   3. Backfill and compact.

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

C. The unit of measurement for payment is each.

END OF SECTION

SECTION 01 22 02

MEASUREMENT AND PAYMENT STORM SEWER

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

	Bid Item No.
1. Storm Sewer Mains (Granular Backfill)	ST-01
2. Storm Sewer Manholes	ST-02
3. Catch Basin/Inlets	ST-03
4. Dig Down and Pour Crown on Storm Sewer Utility Hit	ST-04

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 abandoned 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 provide 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 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.

1.5 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.

1.6 DIG DOWN AND POUR CROWN ON STORM SEWER UTILITY HIT

A. The unit price for Dig Down and Pour Crown on Storm Sewer Utility Hit work includes:
   1. General Work Items of Article 1.2.
   2. Excavating.
   3. Exposing storm sewer line for repairs.
   4. Framing crown over storm sewer prior to concrete crown pour.
   5. Pouring crown over storm sewer and crown frame.
   6. Providing reinforcement and drilling into sewer for connection.
   7. Backfill and compaction.

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

C. The unit of measurement for payment is each.

END OF SECTION

SECTION 01 22 03

MEASUREMENT AND PAYMENT WATER SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

	Bid Item No.
1. Water Mains (Granular Backfill)	W-01, W-03, W04 & W-05
2. Water Mains (Natural Backfill)	W-02
3. 6-Inch Water Main Services or Hydrant Leads	W-06
4. 2-Inch Corporation with Plug or Saddle and HDPE Pipe	W-07
5. Water Services	W-08 & W-10
6. Corporation and Curb Stop	W-09 & W-11
7. Valves	W-12, W-13, W-14 & W-15
8. Fire Hydrants	W-16
9. Connection to Existing Water Mains	W-17
10. Water Main Offset	W-18
11. Dig Down and Verify Water Lateral Size and Material	W-19
12. Abandon/Remove Water Main and Appurtenances	W-20

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 water 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 abandoned existing water main 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 provide 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 WATER MAINS (GRANULAR BACKFILL)

A. The unit price for Water Main (Granular Backfill) work includes:
    1. General Work Items of Article 1.2.
    2. Water pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
    3. Ductile or cast iron fittings.
    4. Tracer wire.
    5. Polyethylene encasement of ductile iron or cast iron pipe and fittings.
    6. Blocking and joint restraints.
    7. Disinfection of pipelines.

B. Measurement of payment will be the actual horizontal length along the centerline of the installed water main with no deductions for fittings and valves.

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

1.4 WATER MAINS (NATURAL BACKFILL)

A. The unit price for Water Main (Natural Backfill) work includes:
   1. General Work Items of Article 1.2.
   2. Water pipe and fittings of material stated in the Unit Price Bid Schedule and installed using the open trench method.
   3. Ductile or cast iron fittings.
   4. Tracer wire.
   5. Polyethylene encasement of ductile iron or cast iron pipe and fittings.
   6. Blocking and joint restraint.
   7. Disinfection of pipelines.

B. Measurement of payment will be the actual horizontal length along the centerline of the installed water main with no deductions for fittings and valves.

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

1.5 6-INCH WATER MAIN SERVICES OR HYDRANT LEADS

A. The unit price for 6-Inch Water Main Services or Hydrant Leads work includes:
   1. General Work Items of Article 1.2.
   2. Pipe and fittings of material stated in the Unit Price Bid Schedule.
   3. Blocking and joint restraints.
   4. Tracer wire
   5. Disinfection of pipeline.
   6. Polyethylene encasement of ductile iron or cast iron pipe and fittings.

A. Measurement for payment will be the actual horizontal length along the centerline of the installed from the centerline of the water main to the centerline of the hydrant with no deductions for fittings and valves.

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

1.6 2-INCH CORPORATION WITH PLUG AND HDPE PIPE

A. The unit price for 2-Inch Corporation with Plug and HDPE Pipe work includes:
   1. General Work Items of Article 1.2.

2. Provide and install 2-inch corporation with plug (where required) with 2-inch HDPE pipe.
3. Provide and install 2-inch corporation with saddle (where required) with 2-inch HDPE pipe.
4. Remove 2-inch corporation with plug.

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

C. The unit of measurement for payment is each.

1.7 WATER SERVICES

A. The unit price for Water Services work includes:
1. General Work Items of Article 1.2.
2. Pipe and fittings of material stated in the Unit Price Bid Schedule.
3. Tracer wire.
4. Disinfection of pipelines.
5. Installed an 8'- 4"x4" board at the end of the lateral.

B. Measurement of payment will be the actual horizontal length along the centerline of the installed water service with no deductions for fittings and curb stops.

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

1.8 CORPORATION AND CURB STOPS

A. The unit price for Corporation and Curb Stops work includes:
5. General Work Items of Article 1.2.
6. Supply curb stops and curb boxes.
7. Connection to existing water service (where required).
8. Installation of curb stops and curb boxes.
9. Tracer wire.

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

C. The unit of measurement for payment is each.

1.9 VALVES

A. The unit price for Valves work includes:
1. General Work Items of Article 1.2.
2. Valve.

3. Valve box.
4. Polyethylene encasement.
5. Stem.
6. Bedding material.

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

C. The unit of measurement for payment is each.

1.10 FIRE HYDRANTS

A. The unit price for Fire Hydrants work includes:
   1. General Work Items of Article 1.2.
   2. Fire hydrant complete of the specified bury depth.
   3. Blocking and joint restraints.
   4. Hydrant wrenches.
   5. Hydrant markers.
   6. Polyethylene encasement.
   7. Drainage pit.
   8. Disinfection of hydrant.
   9. Tracer wire.
   10. Tracer wire access box.

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

C. The unit of measurement for payment is each.

1.11 CONNECTIONS TO EXISTING WATER MAINS

A. The unit price for Connection to Existing Water Mains work includes:
   1. General Work Items of Article 1.2.
   2. Locating existing water main.
   3. Connection to the end of existing pipe.
      a. Remove existing plug.
      b. Direct connection to end of existing pipe.
      c. Transition fittings, if required.

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

C. The unit of measurement for payment is each.

1.12 WATER MAIN OFFSET

A. The unit price for Water Main Offset work includes:
   1. General Work Items of Article 1.2.
   2. Ductile iron fittings and PVC pipe.
   3. Tracer wire.
   4. Polyethylene encasement of ductile iron pipe and fittings.
   5. Blocking and joint restraints.

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

C. The unit of measurement for payment is each.

1.13 DIG DOWN AND VERIFY LATERAL SIZE AND MATERIAL

A. The unit price for Dig Down and Verify Lateral Size and Material work includes:
   1. General Work Items of Article 1.2.
   2. Excavate down to existing water lateral to expose the existing lateral to verify the lateral's size, material, and depth.
   3. Excavation and compaction.

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

C. The unit of measurement for payment is each.

1.14 ABANDON / REMOVE WATER MAIN AND APPPURTENANCES

A. The unit price for Abandon/Remove Water Main and Appurtenances work includes:
   1. General Work Items of Article 1.2.
   2. Excavating
   3. Install bulkheads and abandon water line.
   4. Removing existing water main where in conflict with other utilities.
   5. Providing and placing flowable fill.
   6. Backfilling and compacting.
   7. 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 04

MEASUREMENT AND PAYMENT STREET AND DRAINAGE CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

	Bid Item No.
1. Unclassified Excavation.	SD-01
2. Crushed Aggregate Base and Surface Course	SD-02
3. Asphaltic Concrete Pavement Patch	SD-03
4. Portland Cement Concrete Curb and Gutter	SD-04
5. Remove Pavement	SD-05, SD-06 & SD-07
6. Portland Cement Concrete Pavement	SD-08 & SD-09
7. Portland Cement Concrete Driveway and Sidewalk	SD-10
8. Deformed Reinforcement Bars	SD-11
9. Drilling Tie Bars	SD-12
10. Landscaping – Topsoil, Seed, Fertilize, and Mulch	SD-13

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 provide by the Owner.
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 UNCLASSIFIED EXCAVATION

A. The unit price for Unclassified Excavation work includes:
   1. General Work Items of Article 1.2.
   2. Removal of topsoil to depth available.
   3. Hauling and stockpiling topsoil.
   4. Excavation to subgrades shown on the Drawings.
   5. Hauling of unclassified material.
   6. Placing unclassified material in fill areas to subgrades shown on the Drawings and the subgrade required for placement of topsoil.
   7. Compaction of subgrade and fill areas.
   8. Test rolling subgrade.
   9. Excavation of undercut areas for placing topsoil.
   10. Respreading topsoil to final grades shown on the Drawings.
   11. Disposal of surplus topsoil, unclassified material and unsuitable material.
   12. Preparation of disposal site and transportation of material over an Engineer approved haul route from the site including all loading and dumping of material
   13. Finish grading.

B. Measurement of payment will not be made unless there is a change in project scope. The estimated quantity represents the computed volume by comparing the triangulated surfaces and will be the basis for payment.

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

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 provide 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 (7) percent total moisture determined based on the dry mass of the aggregates will have moisture content in excess of seven (7) percent deducted from the measured weight.

C. The unit of measurement for payment is tons.

1.5 ASPHALTIC CONCRETE PAVEMENT PATCH

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. Grading subgrade (where required).
5. Asphaltic concrete placement and compaction to a thickness of 4-inches and width shown on the drawings or specified elsewhere.
6. Tack coat between asphaltic concrete courses and abutting pavements.

B. Measurement for payment will be the area of roadway patched.

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

1.6 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.

1.7 REMOVE PAVEMENT

A. The unit price for Remove Pavement work includes:
   1. General Work Items of Article 1.2.
   2. Sawcutting, breaking, and removal of existing asphaltic concrete pavement or concrete pavement over the project limits.
   3. Sawcutting to protect adjacent roadway surfaces.

B. Measurement of payment will not be made unless there is a change in project scope. The estimated quantity represents the computed area based off the City survey and will be the basis for payment.

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

1.8 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 24" 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.

1.9 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.

1.10 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 2 number 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.

1.11 DRILLING TIE BARS

A. The unit price for Drilling Tie Bars work includes:
   1. General Work Items of Article 1.2.
   2. Providing and installing tie 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.
   1. This item applies to concrete curb and gutter

C. The unit of measurement for payment is each.

1.12 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 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:

	Bid Item No.
1. Pipe Foundation Stabilization	SC-01
2. Inlet Protection Erosion Control	SC-02
3. Tracking Pad	SC-03
4. Adjusting Existing Structure Frame and Casting	SC-04 & SC-05
5. Manhole Reconstruct	SC-06
6. Traffic Control	SC-07 & SC-08
7. Salvage & Replace Fence	SC-09
8. Remove Concrete Bases and Street Lights	SC-10 & SC-11
9. Conduit	SC-12 & SC-13
10. Pull Box	SC-14
11. Concrete Bases	SC-15 & SC-16
12. Electrical Wire Lighting	SC-17 & SC-18
13. Electrical Service Meter Breaker Pedestal	SC-19
14. Transformer Base Breakaway	SC-20
15. Poles Type 5-Aluminum anodized black	SC-21
16. Luminaire Arms	SC-22
17. Luminaire Utility LED C	SC-23
18. Lighting Control Cabinet , 120/240 24-inch	SC-24

A. 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 provide 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 4” 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 24” plus1:1 side slopes.
   3. The top width is the pipe outside diameter plus 24”.

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 TRACKING PAD

A. The unit price for Tracking Pad work includes:
   1. General Work Items of Article 1.2.
   2. Install to the dimensions as shown on the drawing or specified elsewhere.
   3. Providing filter fabric.
   4. Providing crushed aggregate base course (3 inch clear stone).
   5. Daily maintenance of aggregate.
   6. Removal of aggregate and restore with topsoil, seed, fertilizer and mulch.

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

C. The unit of measurement for payment is each.

1.6 ADJUST EXISTING STRUCTURE FRAME CASTING

A. The unit price for Adjusting Existing Structure Frame Casting work includes:
   1. General Work Items of Article 1.2.
   2. City of De Pere will provide structure castings. Contractor will pick up castings at 925 South Sixth Street.
   3. Removal of the casting and existing adjusting rings from the structure as required.
   4. Providing concrete adjusting rings and a 2 inch rubber riser ring from the WisDOT approved product list.
   5. Bituminous plastic cement sealing the exterior of the adjusting rings and casting.
   6. The ring will be secured to the precast section with a 3 ½" wide Kent Seal or equal.
   7. Above the concrete ring attach ¼ inch thru 3 inch thick ring using two 5/16 inch bead above and below the ring of sealant type as recommended by the rubber manufacturer.
   8. Initial and final adjustment.
   9. Backfilling and compacting.

B. Measurement for payment will be the actual number of structure frame casting adjusted.

C. The unit of measurement for payment is each.

1.7 MANHOLE RECONSTRUCT

A. The unit price for Manhole Reconstruct work includes:
   1. General Work Items of Article 1.2.
   2. City of De Pere will provide structure castings. Contractor will pick up castings at 925 South Sixth Street.
   3. Removal of the casting, existing adjusting rings and sections of structure.
   4. Providing precast cone section for manholes.
   5. Providing concrete adjusting rings and a 2 inch rubber riser ring from the WisDOT approved product list.
   6. Bituminous plastic cement sealing the exterior of the adjusting rings and casting.
   7. The ring will be secured to the precast section with a 3 ½" wide Kent Seal or equal.
   8. Above the concrete ring attach ¼ inch thru 3 inch thick ring using two 5/16 inch bead above and below the ring of sealant type as recommended by the rubber manufacturer.
   9. Initial and final adjustment.
   10. Backfilling and compacting.

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

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

1.8 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.

B. Measurement for payment will not be made.
   1. This bid item applies to those traffic control items specifically listed on the bid schedule.
   2. All other traffic control is incidental to other items bid.

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

1.9 SALVAGE AND REPLACE FENCE

A. The unit price for Traffic Control 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.

1.10 REMOVE CONCRETE BASES AND STREET LIGHTS

A. The unit price for Removal of Concrete Bases and Street Lights includes:
   1. General Work Items of Article 1.2.
   2. Remove concrete bases and lights as shown on plans.
   3. Provide and place salvaged backfill or other approved material in all trenches or holes resulting from the removal.
   4. Place light poles and fixtures materials for salvage in a neat pipe outside of the construction limits but within the right of way at locations the engineer approves.
   5. Hauling and disposal of all concrete, stone, conduit, and other material not designated for salvage in accordance with all regulations governing solid waste disposal.

B. Measurement for removal of concrete bases will be as each individual concrete base. Measurement for removal of street lights will be as each individual pole.

C. The unit of measurement for payment is each.

1.11 CONDUIT

A. The unit price for Conduit work includes:
   1. General Work Items of Article 1.2.
   2. Furnishing and installing all materials, including conduit, fittings, couplings and connections to manholes.
   3. Excavating or directional drilling, backfilling, and disposing of surplus materials.
   4. Underground conduit shall be sized per code requirements. The minimum size shall be 2” PVC buried a minimum of 30” below finished surface.

B. Measurement for payment will be the actual length by linear feet measured along the centerline of the conduit from the centerline of fitting to the centerline of fitting, or end of conduit or between ends of conduit of duct.

C. The unit of measurement for payment is by linear foot.

1.12 PULL BOXES

A. The unit price for Pull Boxes includes:
   1. General Work Items of Article 1.2.
   2. Providing and installing all materials including drain piping components and aggregate.
   3. For providing and installing manhole frames and covers.
   4. For all pull box extensions and conduit extensions less than 10 feet long including fittings.
   5. For excavating, backfilling, and disposing of surplus materials, and for restoring the site.

B. Measurement for payment will be as each individual box.

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

1.13 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.

1.14 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. The contractor will be responsible to 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.

1.15 ELECTRICAL SERVICE METER BREAKER PEDESTAL

A. The unit price for Electrical Service Meter Breaker Pedestal work includes:
1. General Work Items of Article 1.2.
2. Furnishing and installing an approved meter breaker pedestal, steel tubing, stainless steel bolts, grounding electrodes, connections, steel reinforcement (where required), anchor rods, nuts, washers, conduit and fittings.
3. All necessary conductors and equipment required by the local utility for a service connection.
4. Installing an approved meter seal at all access points on the meter trough.
5. For embedded conduit and electrical components.
6. Providing, installing, and protecting the concrete foundation.
7. For excavating, backfilling, disposing of surplus materials, and restoring the site.
8. For providing the equipment and installation of a complete and operational system commencing from the load side of the service transformer.
9. For requesting a commercial electrical inspection from the City's building inspection department. Anticipate three (3) business days for the City to complete the inspection. The fee for this inspection will be waived.
10. For coordinating with the City and Wisconsin Public Service Corporation (WSPC) before any equipment is installed.

B. Measurement for payment will not be made.

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

1.16 TRANSFORMER BASE BREAKAWAY

A. The unit price for Transformer Base Breakaway includes:
1. General Work Items of Article 1.2.
2. Providing and installing the Transformer Base including grounding lugs and related mounting hardware.
3. For leveling shims and for corrosion prevention.

B. Measurement for payment will be as each individual transformer base.

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

1.17 POLES, TYPE 5-ALUMINUM, ANODIXED BLACK

A. The unit price for Poles, Type 5-Aluminum, Anodized Black includes:
   1. General Work Items of Article 1.2.
   2. Providing and installing poles including grounding lugs and related mounting hardware.
   3. For hardware and fitting necessary to install the poles.
   4. For leveling shims, dampeners, and for corrosion protection.

B. Measurement for payment will be as each individual pole.

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

1.18 LUMINAIRE ARMS

A. The unit price for Luminaire Arms includes:
   1. General Work Items of Article 1.2.
   2. Providing and installing the arm including related mounting hardware and shims.

B. Measurement for payment will be as each individual arm.

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

1.19 LUMINAIRE UTILITY LED C

A. The unit price for Luminaire Utility LED C work includes:
   1. General Work Items of Article 1.2.
   2. Furnishing and installing all materials, including a 250 watt equivalent LED luminaire with shorting cap, accessories, hardware, and fittings necessary to install the luminaire in workable first class condition.
   3. Providing photometric point-by-point analysis drawings based on the spacing found on the plans using 0.75 as a combined depreciation factor.
   4. Provide a minimum warranty of 10 years from the date of installation.

B. Measurement of payment will be as each individual lighting unit.

C. The unit of measurement for payment is each.

1.20 LIGHTING CONTROL CABINET

A. The unit price for Lighting Control Cabinet work includes:
   1. General Work Items of Article 1.2.
   2. Providing and installing the lighting cabinet together with the circuit wiring connections, hardware, and fittings.
   3. Providing 20 amp breakers for the six 2P branch breakers shown in the control cabinet schematic.

B. Measurement of payment will be as each individual lighting control cabinet.

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 Tuesday 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. Mail boxes.
   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 4 by 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 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 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 four (4) hard copies or electronic copies 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 preliminary submittal schedule, print and distribute copies of the revised submittal schedule to the Engineer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the field office.
   1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in 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 four (4) copies of each required submittal. The Engineer will retain two copies, and return the others 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/Architect 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 following permits are being obtained by the Owner:
   1. WDNR – Water Main Extension
   2. WDNR – WRAPP
   3. Brown County Highway Department

B. Any costs associated with violations pertaining to the NOI permit will be the responsibility of the Contractor.

PART 2 – PRODUCTS

PART 3 – EXECUTION

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, verity 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 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 72 hours before the related work begins.
   2. Provide construction reference stakes for subgrade at a minimum of 50 foot intervals and maximum of 100 foot intervals on tangents. Provide construction reference stakes for subgrade at 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 50 foot intervals and maximum of 100 foot intervals on tangents. Provide construction reference stakes for top of crushed aggregate at 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

LED 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 Breakway 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:
   i. The new pavement is type R1.
   ii. 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 he luminaries to their respective brand 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

EXHIBITS

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Exhibit 1 Solid-State Light Fixture Product Checklist

Solid-State Light Fixture Product Checklist

	Description	Reqd	Response
2.1 Product			
A.	Product Manufacturer	X	
	Product Model Number	X	
B.1 (a)	Making LED street lights for how long?	X	
B.1 (b)	How long has this model been produced?	X	
B.1 (c)	Warranty (years)	X	
B.2 (d)	Mounting Proposed?	X	
B.2 (e)	ANSI vibration rating (3G is required if box is checked)	☐	
B.2 (f)	Fixture weight (lbs.)	X	
B.3 (a)	LED manufacturer and model number	X	
B.3 (c)	CCT (°K)	X	
B.3 (d)	CRI	X	
B.3 (e)	Projected L70 life (hours)	X	
B.4 (a)	IES optical distribution type	X	
B.4 (b)	BUG Rating	X	B U G
B.4 (c)	Efficacy (Lumens/Watt)	X	
B.4 (c)	Drive Current (mA/Pole)	X	
B.4 (d)	Optics IP rating	X	
B.5 (c)	Available input voltage range (s)	X	
B.5 (c)	Dimming availability and additional cost (Dimming required if box is checked)	☐	$
B.5 (d)	Driver rated life (hours) and max case temp	X	
B.5 (e)	Surge protection level	X	
B.5 (g)	Photocell Receptacle availability (receptacle is required if box is checked)	☐	Provide Shorting Caps
1.3 Submittals			
G.	Average Luminance (cd/m2)	X	
G.	Avg/min and maz/min uniformity	X	
G.	Maximum Lv ratio	X	
	Power Consumption (System Watts/Pole)	X	

APPENDIX

A. SUBSURFACE EXPLORATION AND SUBGRADE ANALYSIS, PROPOSED ROADWAY RECONSTRUCTION AND UTILITY RELAY CHARLES STREET AND ENTERPRISE DRIVE, DE PERE, WISCONSIN BY INTERTEK PSI

B. GEOTECHNICAL ENGINEERING REPORT FOR 2019 CONSTRUCTION DESIGN FOR PROSPER STREET BY ECS MIDWEST, LLC

Subsurface Exploration and Subgrade Analysis

Proposed Roadway Reconstruction and Utility Relay
Charles Street and Enterprise Drive
De Pere, Wisconsin

Prepared for

City of De Pere
925 South Sixth Street
De Pere, Wisconsin

Prepared by

Professional Service Industries, Inc.
2740 Packerland Drive
Suite F
Green Bay, Wisconsin

January 17, 2018

PSI Project 0093510

Cody M. Williquette
Branch Manager

James M. Becco, P.E.
Vice President
Principal Consultant

Green Bay Office
2740-F Packerland Drive
Green Bay, Wisconsin 54313

January 17, 2018

Mr. Eric Rakers
City of De Pere
925 South Sixth Street
De Pere, Wisconsin 54115

SUBJECT: **Subsurface Exploration and Subgrade Analysis**
Proposed Roadway Reconstruction and Utility Relay
Charles Street and Enterprise Drive
De Pere, Wisconsin
PSI Project No. 0093510

Dear Mr. Rakers,

The subsurface exploration and analysis for the referenced project has been completed, the results of which are included herein. A copy has been provided electronically. After you have had the opportunity of reading the report, please call at any time with any questions or comments you may have. Professional Service Industries, Inc., an Intertek company, appreciates the opportunity to be of service on this project, and looks forward to continuing as your geotechnical consultant during the design and construction phases, as well as your upcoming projects.

Sincerely yours,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Cody M. Williquette
Branch Manager

James M. Becco, P.E.
Vice President

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APPENDIX (in order of appearance)

Figure 1 - Boring Location Diagram (Enterprise Drive)
Figure 2 – Boring Location Diagram (Charles Street)
Soil Boring Logs
Laboratory Data Sheets
General Notes

INTRODUCTION

General

This report presents the results of the subsurface exploration and subgrade evaluation for the proposed Charles Street and Enterprise Drive road reconstruction and utility relay projects in the City of De Pere, Wisconsin. The work was performed for the City of De Pere, at the request of Mr. Eric Rakers.

Purpose

The purpose of this study was to evaluate the subsurface conditions at specific boring locations along the roadways, and to establish parameters for use by the design engineers in preparing the road/utility subgrades and pavement section designs for the proposed project.

Scope

The scope of services included a site reconnaissance, the subsurface exploration, a determination of soil characteristics by field and laboratory testing, and an evaluation and analysis of the data obtained. The scope of the field work, including the number, depth, and locations of the borings was determined by the client.

Authorization

The scope of services was performed in accordance with a signed agreement (PSI Proposal No. 0093-201833, dated February 15, 2017), between PSI and the City of De Pere. The general conditions for the performance of the work were referenced in the proposal. This report, summarizing the subsurface exploration and subgrade evaluation, has been prepared on behalf of, and exclusively for the use of the City of De Pere. The information contained in this report may not be relied upon by any other parties without the written consent of PSI, and acceptance by such parties of PSI's General Conditions.

PROJECT AND SITE DESCRIPTION

Project Location

The project sites are located along Charles Street and Enterprise Drive in De Pere, Wisconsin. More specifically, the borings located on Enterprise Drive were between Heritage Road and Millennium Court, and the borings located on Charles Street were located between South Michigan Street and South Webster Avenue. The project length along Charles Street is approximately 2,700-feet and the project length along Enterprise Drive is approximately 2,500-feet in length. The general location of the site is depicted in the enclosed Boring Location

Diagrams (Figure 1 and Figure 2).

Project Description

Based on preliminary information provided by Mr. Eric Rakers of the City of De Pere, it is understood that the project will consist of roadway reconstruction and utility relay. The utility relay will include the installation of 12-inch PVC (or RCP CL III) storm sewer and 16-inch PVC water main along sections of Enterprise Drive; and 24-inch PVC sanitary sewer along Charles Street. Enterprise Drive is planned to be made approximately 10 feet narrower as part of this project and the new utilities will be relayed or installed in the newly enlarged terrace area.

According to the plans provided by the City of De Pere Engineering Department and the information provided by Mr. Joe Holzwart of Donohue and Associates, Inc., the new utility pipes along Enterprise Drive will bear at depths ranging between about 6 to 7 ½ feet. They will be between about 10 to 22 feet deep on Charles Street. Therefore, excavations of up to about 8 feet on Enterprise Drive and up to about 22 feet on Charles Street are anticipated to be necessary to establish the pipe bearing elevations.

It is estimated that the roadway grades and alignments will generally remain unchanged for the project. Specific traffic loading was not known at the time of this analysis. Based on visual observation of traffic conditions during the exploration, it is estimated that existing traffic generally consists of passenger cars and occasional commercial trucks.

Site Description

The existing pavement along Charles Street generally consists of a residential, two-lane asphalt roadway. The existing pavement along Enterprise Drive generally consists of a commercial, two-lane concrete roadway. Curb and gutter was located along the project routes. Plans and associated typical existing sections were not provided. At the time of the site reconnaissance, the asphalt and concrete pavement was generally in fair condition with no major rutting and cracking observed. Some alligator cracking was observed along the curb lines in some areas of the roads. The age of the pavements along the project route was not known at the time of this report.

The topography of Charles Street is generally sloping down to the west, with an elevation difference of approximately 18.5 feet (EL. 630.1 to EL. 611.6) measured between borings C-1 through C-6. The topography of Enterprise Drive is rolling, with an elevation difference of approximately 4.9 feet (EL. 642.3 to EL. 637.4) measured between borings E-1 through E-4, generally sloping to the north and south from boring B-2, which is the boring at the highest elevation.

EXPLORATION AND LABORATORY PROCEDURES

Scope Summary

The field and laboratory data utilized in the evaluation and analysis of the pavement was obtained by performing exploratory test borings; securing material samples by bulk and split-spoon sampling methods; and subjecting the samples to laboratory testing.

Field Exploration

Ten (10) soil test borings were drilled for this project to depths ranging between 7 and 24 feet below existing site grades. More specifically, six (6) borings were performed on Charles Street to depths ranging between 7 and 24 feet (identified as C-1 through C-6), and four (4) borings were performed on Enterprise Drive to a depth of 9 feet (identified as E-1 through E-4). The number, depths, and locations of the borings were provided by the client. The borings for this project were located in the field by the client's representative in the locations indicated on the boring location diagrams (see Figure 1 and Figure 2). The ground surface elevations shown on the boring logs were provided by the client.

The soil test borings were performed with a truck-mounted rotary drilling rig utilizing continuous flight hollow stem augers to advance the holes. Representative samples were obtained by the Standard Penetration Test (SPT) method using split-spoon sampling procedures in general accordance with ASTM D-1586 procedures. Samples were collected at 2.5-foot intervals to 10 feet, and then at 5 foot intervals thereafter to the end of the borings. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The SPT provides a means of estimating the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of evaluating the relative strength and compressibility characteristics of the subsoils.

The SPT samples were transferred into clean glass jars immediately after retrieval, and returned to the laboratory upon completion of the field operations. Samples will be stored for a period of 30 days at which time they will be discarded unless other instructions are received. All soil samples were visually classified by a soils engineer in general accordance with the Unified Soil Classification System (ASTM D-2488). After completion of the borings, the auger holes were backfilled to near the ground surface with bentonite chips and the surface was patched with cold asphalt.

A copy of the Soil Boring Logs and Boring Location Plans (Figure 1 and Figure 2) are enclosed in the Appendix. The soil stratification shown on the logs represents the approximate soil

conditions in the actual boring locations at the time of the exploration. The terms and symbols used on the logs are described in the General Notes found in the Appendix.

Laboratory Testing

Soil samples obtained from the exploration were visually classified in the laboratory, and subjected to testing, which included moisture content determinations, Atterberg Limits, and grain-size analysis by the mechanical method.

Selected cohesive soil samples were tested in unconfined compression with a controlled strain loading rate and/or with a calibrated hand penetrometer to aid in evaluating the soil strength characteristics. The values of strength tests performed on soil samples obtained by the Standard Penetration Test Method (SPT) are considered approximate, recognizing that the SPT method provides a representative but somewhat disturbed soil sample.

The laboratory testing was performed in general accordance with the respective ASTM methods, as applicable, and the results are shown on the boring logs and data sheets in the Appendix.

DESCRIPTION OF SUBSURFACE CONDITIONS

General

A description of the subsurface conditions encountered at the test boring locations is shown on the Soil Boring Logs, enclosed in the Appendix. The lines of demarcation shown on the logs represent approximate boundaries between the various soil classifications. It must be recognized that the soil descriptions are considered representative for the specific test boring locations, and that variations may occur between and beyond the sampling intervals and the widely spaced boring locations. Soil depths, topsoil and layer thicknesses, and demarcation lines used for preconstruction planning should not be expected to yield exact and final quantities. A summary of the major pavement and soil profile components encountered at the boring locations, is described in the following paragraphs.

Soil Conditions

At the time of the exploration, the asphalt thicknesses ranged between about 3 to 7 inches on Charles Street, and the concrete thicknesses ranged between about 7 to 8 inches on Enterprise Drive. The underlying base course materials consisted of crushed stone with sand, and ranged between about 3 to 11 inches in thickness. The subgrade underlying the surface pavement and base materials generally consisted of reddish brown to brown clay, and brown sand. As exceptions, possible fill, possible buried topsoil, and buried topsoil were encountered in borings C-1, C-2, C-3, C-4, and C-6 extending to depths of about 1.5 to 2.5 feet (EL. 627.6 to EL. 609.1±) below existing grade.

The possible fill, possible buried topsoil, and buried topsoil materials were classified as such based on their varied visual characteristics and composition. However, it must be recognized that in the absence of foreign substances and/or debris within the soil samples obtained, it is difficult to distinguish between natural soils and clean soil fill.

The most common soil type within the borings was clay. This clay was typically of low to medium plasticity with the typical AASHTO classification being A-6. The moisture contents of the clay found within the upper profile, just below the base course, possible fill, possible buried topsoil, and buried topsoil ranged between 15 and 24 percent.

The natural cohesive soils were generally soft to hard in comparative consistency with Standard Penetration resistances (N-values) typically between about 4 and 43 blows per foot (bpf), and unconfined compressive strength values ranging between about 0.5 tons per square foot (tsf), to values exceeding 4.5 tsf. The natural granular soils encountered along Enterprise Drive were generally medium dense to dense in comparative consistency with Standard Penetration resistances (N-values) typically between about 9 and 21 blows per foot (bpf)

The results of the sieve analyses, Atterberg Limits, and associated USCS and AASHTO classifications for the selected subgrade samples are shown in the following table:

Boring	Sample Depth (ft)	Percent Passing Sieve No.			Atterberg Limits		USCS Classification	AASHTO Classification
		#10	#40	#200	LL	PI		
C1 - C3	0 - 1	55	35	19.2	-	-	SM	A-1-b
C4 - C6	0 - 1	68	47	35.0	-	-	SM	A-2-4
C1 - C6	1 - 4	99	97	88.2	38	20	CL	A-6
E2 - E4	0 - 1	67	48	34.1	-	-	SM	A-2-4
E2 - E4	1 - 4	98	95	82.9	36	19	CL	A-6

Based on the above results, the natural cohesive subgrade soils tested have been generally classified as lean clay (CL) by the USCS classification system, and as A-6 by the AASHTO system. The existing base course materials tested have generally been classified as silty sand (SM) by the USCS classification system, and A-2-4 and A-1-b by the AASHTO system.

The foregoing discussion of soil conditions on this site represents a generalized soil profile as determined at the test boring locations. A more detailed description and supporting data for each test location can be found on the individual Soil Boring Logs.

Groundwater Observations

Groundwater observations were made during the drilling operations and in the open boreholes upon completion of the drilling operations. Groundwater was not encountered in the boreholes at the time of drilling. All of the holes caved to varying depths upon withdrawal of the auger; therefore, observations could not be made below the caved depth.

On the basis of the field observations and the soils relative moisture contents, the groundwater level is estimated to be below the depth of the borings at the time of the exploration. It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics.

EVALUATION AND RECOMMENDATIONS

General Development Considerations

On the basis of the preliminary design information provided by the City of De Pere's Engineering Department and Donohue and Associates, Inc., the new utility pipes will bear at depths ranging between about 6 to 7 ½ feet along Enterprise Drive, and between about 10 to 22 feet on Charles Street. Soils encountered at these depths in most of the borings can generally be used for support of the proposed pipelines. However, lower strength clay soils were encountered in C-1 at about 13.5 feet (EL. 598.1) below existing grade. These soils are subject to a substantial loss in strength when the confining effect of the overburden soil is removed. Some difficulties may be experienced in maintaining excavation sidewall stability and in developing a stable subgrade in some areas of the project, especially when excavations encroach upon or extend below any perched water zones in some areas of the project. All pipelines must bear upon a suitable subgrade or properly placed structural fill.

Utility construction should be performed in accordance with "The Standard Specifications for Sewer and Water Construction in Wisconsin, 5th Edition, with Addendum No. 1 and 2 included." The proposed pavements for this project can be supported by the existing soils following proper preparation, which will include the removal of soft, unstable or unsuitable zones. The following sections give specific recommendations for construction of the proposed utilities and roadway reconstruction.

Site Preparation

The presence of organic topsoil and vegetation in the subgrade can adversely affect the serviceability of structural fills, foundations, floor slabs, pavements, and other structures placed upon them. All topsoil, vegetation, trees, roots and other organic matter must be stripped from the areas of pavements, sidewalks, and other structures.

Since portions of the proposed pipelines will be installed within the planned roadways, any fill used above the pipe bedding and cover material should consist of a relatively clean granular material to provide adequate support for the overlying roadway. Substantial portions of the soils encountered within the borings generally consisted of clay. It is considered extremely difficult to achieve proper compaction of clay and high silt content soils in narrow utility trenches, and they are therefore not recommended for reuse in areas of overlying structures. The use of imported granular fill will be necessary in some areas to avoid delays, especially if construction is performed during cool weather, when drying will be difficult.

After the removal of topsoil and other unsuitable bearing materials, and the installation of the utilities and associated backfill, the pavement subgrade should be thoroughly proofrolled to detect unstable, yielding soils, which must be removed or improved by appropriate preparation and compaction techniques. Scarification and drying of wet soils or removal and replacement with suitable fill, are two methods which can be considered, but this should be determined by the soils engineer at the time of construction.

When a firm and stable subgrade is established, low areas may be raised to planned grades with properly compacted structural fill. Any new fill should consist of a relatively clean granular soil, such as those materials meeting the gradations outlined in Section 209 or 305 of the State of Wisconsin Standard Specification for Highway and Structure Construction. If fine-grained soils, such as those with high silt or clay content are used to adjust pavement subgrades, they should generally be placed over large open areas, where conditions are more favorable for the proper placement and compaction of such materials. It must be recognized that high silt or clay content materials are difficult to compact when placed at moisture contents beyond a few percent of the optimum moisture content. In addition, portions of the near surface soils across the site are considered moisture sensitive; therefore, some difficulty with subgrade preparation should be expected, especially if they become wet during construction. Fill must be placed in layers of not more than nine (9) inches in thickness, at moisture contents at or near optimum, and be compacted to a minimum density of 95 percent of the maximum dry density as determined by ASTM designation D-698. Silt, clay, organic, and wet granular soils are not suitable for reuse as compacted fill in trenches.

Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities. This is especially true of silty and clayey soils, where scarification and aeration may be required to achieve near-optimum moisture levels prior to compaction. A sheepsfoot roller is generally required for compaction of clayey soils, whereas a vibratory smooth drum roller is preferred for granular material. Small hand-operated or backhoe-mounted plate compactors should be used in confined areas. Granular fills are generally more readily compacted to the desire densities in such applications.

The selection of fill materials for various applications should be done in consultation with the soils engineer. Similarly, the evaluation of the subgrade and placement and compaction of fill

for structural applications should be monitored and tested by a qualified representative of the soils engineer.

Utility Subgrade Analysis

On the basis of the preliminary design information provided by the City of De Pere's Engineering Department and Donohue and Associates, Inc., the new utility pipes will bear at depths ranging between about 6 to 7 ½ feet along Enterprise Drive, and between about 10 to 22 feet on Charles Street. Soils encountered at these depths in most of the borings can generally be used for support of the proposed pipelines. However, lower strength clay soils were encountered in C-1 at about 13.5 feet (EL. 598.1) below existing grade. These soils are subject to a substantial loss in strength when the confining effect of the overburden soil is removed. Substantial difficulties may be experienced in maintaining excavation sidewall stability and in developing a stable subgrade in some areas of the project, especially when excavations encroach upon or extend below any groundwater or perched zones. Some overexcavation of soft or loosened materials, along with replacement with crushed stone or other clean granular material, may be necessary, and may become extensive in at least isolated areas. All pipelines must bear upon a suitable subgrade or properly placed structural fill.

Because no groundwater was encountered in the upper levels of the boreholes during the exploration, no major difficulties during excavation and construction of the proposed utilities and roadways is anticipated. A gravity drainage system and filtered sump pumps or other conventional dewatering procedures, should be adequate to control perched water if encountered. However, more prolonged dewatering with a series of sumps and pumps may be necessary for excavations extending more than a few inches below the long term groundwater or large volume perched zones.

Utility construction should be performed in accordance with "The Standard Specifications for Sewer and Water Construction in Wisconsin, 5th Edition, with Addendum No. 1 and 2 included." The following sections give specific recommendations for construction of the proposed pipeline.

Excavations

Excavation depths are estimated to range between about 8 to 22 feet below grade for the proposed pipelines. Sloping, shoring or bracing of the excavation sidewalls will be necessary. Trenching in granular or soft/low strength clay soils may be difficult due to the instability of vertical slopes, and will therefore require a flattening of trench sides, or some other means of protection, to facilitate construction and to protect life and property. The degree of excavation instability problems is dependent upon the depth and length of time that excavations remain open, excavation bank slopes, water levels and the effectiveness of any dewatering systems. Substantial instability may be experienced with increasing depth, especially when encroaching upon or extending below any groundwater or perched zones, and/or within zones of softer/low strength soils. All excavation work must be performed in accordance with OSHA and local

building code requirements. Proper care must be taken to protect the integrity of nearby pavements and other structures during construction.

All excavations must be performed with caution and utilize methods which will prevent undermining or destabilization of buildings, utilities, pavements, sidewalks or other structures. The use of a properly designed shoring and bracing, sheet piling, or underpinning system must be utilized as necessary to adequately protect buildings, utilities, pavements, and other structures. This must be performed by an experienced specialty contractor. Additionally, extreme care must be used during the installation of any bracing system, especially those using driven or vibratory methods, in order to avoid damaging existing buildings, utilities, and other structures. Consideration should be given to the performance of video and/or photographic documentation of the condition of nearby buildings, utilities, and other structures prior to installation.

It is mandated that excavations, such as for utility trenches, be constructed in accordance with current Occupational Safety and Health Administration (OSHA) guidelines to protect workers and others during construction. PSI recommends that these regulations be strictly enforced. The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

PSI is providing this information solely as a service to our client. PSI does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

To provide adequate subgrade support conditions, all utilities should be backfilled with properly placed and compacted structural fill. This should typically consist of clean granular material, such as the existing sand soils encountered along the project route. However, any material placed as backfill must be at proper moisture contents so that adequate compaction can be achieved. Substantial drying of some portions of the on-site soils may be necessary.

Pipe Material

In order to reduce the amount of pipe deflection, it must be recognized that proper selection and compaction of the pipe bedding and cover materials is essential. This should be done in accordance with the Standard Specification for Sewer and Water Construction. Bedding material exhibiting a well-defined moisture density relationship should be compacted to 95 percent of ASTM D-698 (Standard proctor). Pipelines and associated manholes bearing upon suitable soils or upon properly placed and compacted structural fill can generally be designed to

exert a net allowable bearing pressure of 2,000 pounds per square foot in most areas. However, natural soft/lower strength clay soils were encountered in C-1 at a depth of approximately 13.5 feet (EL. 598.1), and other loose, soft, or otherwise unsuitable zones may occur between or beyond the borings. Manholes bearing within such soils must utilize a net allowable bearing pressure not exceeding 1,000 psf. In addition, such soils can become substantially unstable when the confining effect of the overburden is removed, especially in the presence of water. The use of undercutting, in conjunction with a coarse stone working mat, may be necessary to achieve a suitable bearing subgrade.

Trench Backfilling

Backfilling of the pipes and trenches should be performed in accordance with the applicable chapters of the Standard Specification for Sewer and Water Construction. This will be dependent on the type of pipe selected, embedment depth and other factors. In general, it is recommended that well-graded granular soils such as those specified in Chapter 6.43.0 of the Standard Specification for Sewer and Water Construction be utilized for bedding, cover and backfill in the utility trenches to reduce the potential for settlement of the fill. Clean crushed granular materials may be used for pipe bedding and cover, provided they are properly placed and compacted.

In planned areas of overlying structures (beneath roads, driveways, utilities, and related structures), any fill used above the pipe bedding and cover material must consist of a relatively well-graded granular material. Substantial portions of the on-site soils encountered in the borings generally consist of clay. It is considered extremely difficult to achieve proper compaction of clay and high silt content soils in narrow utility trenches, and they are therefore not recommended for reuse in areas of overlying structures. Such materials can be used in landscape areas, if desired, recognizing that some subsidence may occur following construction. Importing of suitable granular materials will be necessary (and may be substantial) in some areas to avoid delays, especially if construction is performed during cool weather, when drying will be difficult.

Placement of bedding and cover material shall be sufficient to protect the type of pipe selected as specified by the pipe manufacturer. Trench backfill should be placed in layers not more than 12 inches in loose thickness before compaction, except that the first lift of backfill placed over the pipe can be increased to 24 inches if necessary to protect the pipe from compaction equipment. Subsequently thinner lifts may be required depending on the type and size of compaction equipment available.

It is recommended that mechanical compaction be used to achieve uniform consolidation of all fill materials. Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the specified density. It is recommended that backfill soils be placed at moisture contents within a few percent of their optimum moisture content.

Each lift of backfill must be compacted to a density of at least 95 percent of the maximum dry density as determined by the Standard Proctor method, ASTM D698, as specified in Section 2.6.14b of the Standard Specification for Sewer and Water Construction.

Existing Pavement Section

The existing asphalt and concrete pavement observed along the project route is considered to be in generally fair condition with respect to serviceability and structural integrity.

The existing pavement section at the borings typically consisted of about 3 to 7 inches of hot-mix asphalt (HMA) on Charles Street, and about 7 to 8 inches of concrete on Enterprise Drive, overlying about 3 to 11± inches of base course. The existing aggregate base materials consisted of silty sand with gravel by the USCS Classification system. Results of the grain-size analysis performed on composite samples of the existing base materials does not meet the gradation outlined in Section 305 of the WisDOT Standard Specifications for ¾-inch or 1 ¼-inch dense grade base. It is estimated that a structural layer coefficient (a) of 0.14 can be used for both the existing concrete layer and the existing HMA layer when they are properly pulverized/recycled as an additional base material. The existing base materials are considered suitable to raise grades elsewhere, generally spread over a large area.

The existing aggregate base materials consisted of silty sand with gravel by the USCS Classification system. Results of the grain-size analysis performed on composite samples of the existing base materials does not meet the gradation outlined in Section 305 of the WisDOT Standard Specifications for ¾-inch or 1 ¼-inch dense grade base.

The WisDOT Standard Specifications referenced above, and in the following sections, refers to the State of Wisconsin Standard Specifications for Highway and Structure Construction, latest edition, with current interim specifications.

Pavement Subgrade Analysis

The pavement section must bear upon a suitable, stable inorganic subgrade, prepared as discussed in the Pavement Subgrade Preparation section. Data obtained from the near surface soils encountered at the borings was utilized to evaluate the subsurface condition for pavement support. Recommendations within this report should be considered a general overview of the subsurface conditions for the site, as it relates to pavement analysis, and can be used in preliminary site planning.

The subgrade soils encountered immediately below the pavement section at the borings along the project routes generally consisted of natural clay and sand, as well as clay and sand classified as possible fill, possible buried topsoil, and buried topsoil. The underlying subgrade soils predominantly consisted of natural clay and silty sand. The following recommendations are based upon the poorer clay soils. These cohesive soils have been assigned an estimated

visual classification of A-6 by the AASHTO method. The USDA soil survey generally categorizes the A-6 soils to be poor in applications for pavement subgrade. These cohesive soils are generally rated as poor for pavement subgrade support due to moderate to severe shrink-swell potential and moderate to severe frost susceptibility. These soils are also generally poorly drained and can exhibit low bearing support when wet.

Analysis of the visual soil classifications and laboratory testing information has been made in determining pertinent engineering properties of the subgrade soils. Based on the engineering properties determined from the subgrade soils tested, and with proper subgrade preparation and drainage, the following pavement subgrade design coefficients are recommended for pavement section thickness design along the entire roadway alignment. These values are representative of the support conditions exhibited by the clay subgrade materials. All fill used to raise grades or replace unsuitable materials must have equal or greater support characteristics.

PAVEMENT SUBGRADE DESIGN COEFFICIENTS

SOIL PARAMETER	VALUE
AASHTO Soil Classification	A-6
Drainage	Poor
Shrink/Swell Potential	Moderate to High
Design Frost Index	F-3
Design Group Index	15
Soil Support Value	4.0
Estimated Subgrade Modulus (k)	125

Pavement Reconstruction

The existing clay and sand subgrade soils (and any other high silt or clay content soils) are generally rated as poor to fair for pavement subgrade support due to their high sensitivity to moisture and potential volume changes from freeze-thaw cycles. Typically, it is recommended that deposits of these frost susceptible soils be removed from beneath pavements due to their high fines content, poor drainability, and potential volume changes during freezing. However, the removal and replacement of these soils along the entire project is not likely to be economically feasible. Therefore, reconstruction of the pavement on the existing subgrade soils may require a somewhat thicker pavement section, as well as the installation of proper drainage.

The existing subgrade soils can be used for pavement support; provided the subgrade is properly evaluated and any unsuitable support areas are replaced (such as the buried topsoil that was encountered in C-3 and C-4), prior to construction of the new pavement section. In addition,

due to the frost susceptible subgrade materials encountered along most of the project routes, it will be necessary to control surface runoff and water seepage. It is recommended that underdrains be placed within the subgrade, just below the granular base, to help reduce the potential for trapping water within the aggregate base layer. It is also recommended that proper grading be performed to control surface drainage and prevent water infiltration into the base course. Recommendations for subgrade preparation are provided in the following sections of this report.

Selective Subgrade Removal and Replacement

The subgrade soils must be evaluated and prepared as discussed in this report. Isolated zones of unsuitable fill, possible fill, possible buried topsoil, buried topsoil, and/or natural materials may be encountered, and some removal and replacement may be required. The majority of the soil along the project route is highly moisture sensitive and subject to substantial instability in the presence of water, especially when exposed to construction traffic. During wet and/or cool weather, softened subgrade soils can be expected to develop over large areas. This can result in the need for substantial drying times; significant reworking, drying, discing; and/or the necessity for removal and replacement with crushed stone or compacted structural fill.

Site Drainage

In general, the subgrade soils along the project route are predominantly cohesive and considered to be poorly drained. Drainage action of the subgrade is dependent on the amount of fines (silt and clay) present. High silt and clay content soils have decreased drainability, which increases its sensitivity to moisture and frost, which can result in increased instability. In addition, the proposed project is located in an area that experiences annual freezing cycles and the subgrade soils encountered have been classified as moderately to highly susceptible to frost action when free water is present.

The detrimental effects of frost action within frost susceptible subgrade materials are manifested by non-uniform heave of pavements during winter months and/or the loss of strength of the subgrade during thawing periods. In order to maintain a relatively dry subgrade condition and reduce the potential for frost action, it will be necessary to control surface runoff and water seepage. Adequate longitudinal slope must be provided and/or maintain within roadside ditches, where present, to maintain runoff below the top of the pavement subgrade.

CONSTRUCTION CONSIDERATIONS

Pavement Subgrade Preparation

All surface vegetation, and topsoil must be removed in any widened pavement areas outside of the limits of the existing pavement areas. Additionally, any near surface buried organic topsoil

underlying any new pavement sections, such as encountered at C-3 and C-4, must be removed from beneath new pavements.

Subgrade preparation may require the pulverization of the existing pavement. Pulverization should be performed with suitable equipment and to a depth that extends through the existing HMA and/or concrete surface and into the existing base, but not into the underlying subgrade soils. This will likely require adjustment of the pulverizing depth and should be monitored to prevent intermixing the silty and clayey subgrade soils into the recycled base material. Asphalt millings, crushed concrete, and the existing base course have the potential for reuse as aggregate base, if properly separated from the existing subgrade materials.

After removal of the existing pavement, the exposed subgrade should be prepared as outlined in Section 211 of the WisDOT Standard Specifications. The subgrade should be thoroughly proofrolled to detect unstable, yielding or unsuitable soils, which must be removed or improved by appropriate preparation and compaction techniques. Scarification and drying of unsuitable soils, or removal and replacement with suitable fill, are two methods, which can be considered. This should be determined at the time of construction by a qualified soils engineer. Lime and fly ash modification are two additional remedial measures which can be considered. However, this must only be performed at the direction and under the supervision of the geotechnical engineer. A proper mix design must be performed prior to the performance of any modification. Low areas may then be raised to the planned grades with suitable properly compacted fill where necessary.

In areas where isolated wet, soft or yielding subgrade conditions are encountered during subgrade preparation or a stable subgrade cannot be obtained, selective excavation below subgrade (EBS) and replacement may be required for proper support of new fills, or pavement reconstruction. Excavation below subgrade (EBS) should be performed as outlined in Section 205 of the WisDOT Standard Specifications. The necessity and ultimate extent of undercutting will be dependent upon the moisture condition and stability of the exposed subgrade at the time of construction. In areas of EBS, limited excavation below subgrade to a depth of 1 to 3 feet and replacement with select granular fill can generally be used to improve the stability of the subgrade. It must be recognized that soil stability is dependent on such factors as soil type and moisture content, weather conditions at the time of construction, and also construction disturbance. Thus, the necessity of EBS generally must be determined in the field at the time of construction, based upon observations made during subgrade preparation.

If relatively wet or somewhat unstable inorganic soils are encountered below EBS, it may be necessary to use an SAS (Subgrade Aggregate Separation) geotextile fabric and/or a select crushed material for stabilization (such as that specified in Section 312 of the WisDOT Standard Specifications) before placing backfill soils. The SAS geotextile fabric used in this application should meet the physical requirements identified in Section 645 of the WisDOT Standard Specifications, and shown in the following table.

Test	Units	Values
Grab Tensile Strength	N	750 min.
Puncture Strength	N	300 min.
Apparent Opening Size	um	212 max.
Permittivity	s^{-1}	0.35 min.

The fine-grained soils present within the subgrade are considered sensitive to moisture and construction activity; therefore, every effort should be made to prevent ponding during reconstruction operations and maintain a relatively dry and stable working subgrade. If the soils become disturbed, removal and replacement may be required.

Borrow Material

Only nominal grade changes are anticipated along the project routes. Generally, granular material with limited fines is recommended for use in regrading, or to replace unsuitable soils, such as those specified in Section 305 of the WisDOT Standard Specification for ¾-inch or 1¼-inch materials. The existing base course and/or recycled asphalt/concrete pavement materials may be used to balance grades, and are generally considered suitable for such purposes. However, clay, silt, organic and wet granular soils are not considered suitable for such purposes. All fill used must have subgrade design coefficients equal to or greater than those previously specified.

Fill Placement and Compaction

Fill should be placed in layers of not more than 9 inches in loose thickness before compaction. As an exception, when the fill consists of well-graded granular material and the compaction equipment is adequate for such purpose, the loose layer thickness may be increased to a maximum of 12 inches. Each lift must be compacted to a density of at least 95 percent of the maximum dry density as determined by ASTM designation D-698 (Standard Proctor).

Proper moisture control is essential to reduce the amount of compactive effort necessary to achieve the desired densities. This is especially true of silty and clayey soils, where scarification and aeration may be required to achieve near-optimum moisture levels prior to compaction. It is recommended the fill soils be placed at moisture contents within a few percent of their optimum moisture content. Depending upon seasonal moisture conditions, some drying and/or reworking of these fine-grained soils may be necessary prior to placement.

The selection of fill materials for various applications should be done in consultation with the soils engineer. Similarly, the evaluation of the subgrade preparation, and placement and compaction of fill for structural application should be monitored and tested by a qualified representative of the soils engineer.

Compaction testing is recommended to ensure that the pavement subgrade materials develop the subgrade design coefficients previously specified for adequate pavement section thickness design. Compaction should be performed with equipment suitable for such purpose, such as a sheepsfoot roller for clayey soils, and a vibratory smooth drum roller for granular material.

Groundwater Considerations

Because no groundwater was encountered in the upper levels of the boreholes during the exploration, no major difficulties during excavation and construction of the proposed roadways is anticipated. A gravity drainage system and filtered sump pumps or other conventional dewatering procedures, may be adequate to control perched water if encountered. However, for substantial perched zones, or for excavations extending below the long term groundwater, prolonged dewatering with a series of sumps or well points and high capacity sump pumps, or other more comprehensive means may be necessary to facilitate construction.

Since the subgrade materials are subject to softening when exposed to free moisture, every effort should be made to keep excavations dry. The site grading direct runoff should be directed to catch basins, so that the potential for the softening of the pavement and utility subgrade soils is reduced.

Subgrade Frost Action

The proposed project is located in an area that experiences annual freezing cycles and the subgrade soils encountered have been classified as moderately to highly susceptible to frost action when free water is present. Therefore, some frost movement should be expected. As indicated previously, adequate drainage of the subgrade and base course must be provided.

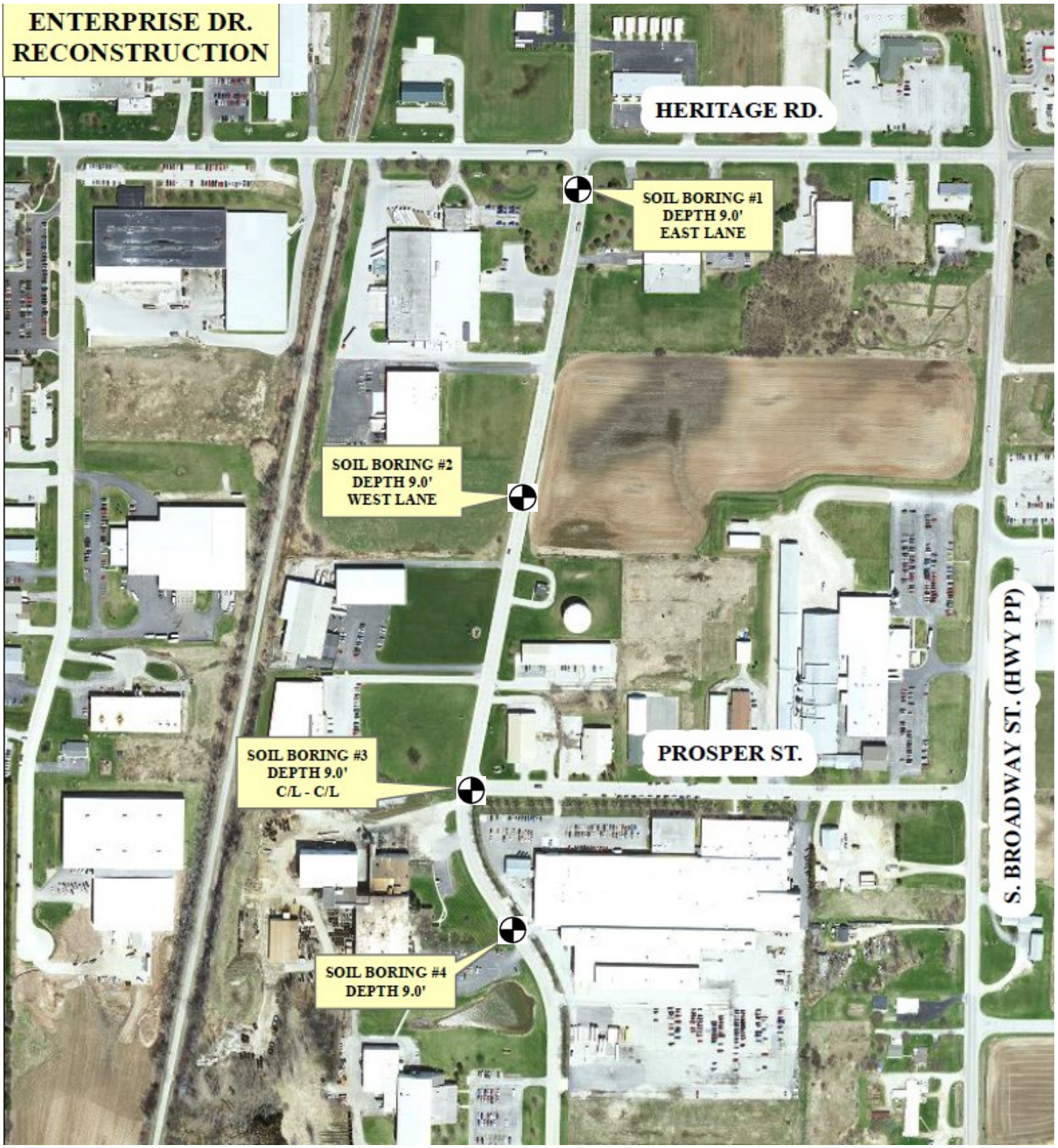
GENERAL COMMENTS

This geotechnical exploration and subgrade analysis has been prepared to aid in the evaluation of the soil conditions on this site. The recommendations presented herein are based on the available soil information and the preliminary design information provided. Any changes in the design information should be brought to the attention of the soils engineer to determine if modifications in the recommendations are required. The final design plans and specifications should also be reviewed by the soils engineer to determine that the recommendations presented herein have been interpreted and implemented as intended.

This geotechnical study has been conducted in a manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The findings, recommendations and opinions contained herein have been promulgated in accordance with generally accepted practice in the fields of foundation

engineering, soils mechanics, and engineering geology. No other representations, expressed or implied, and no warranty or guarantee is included or intended in this report.

It is recommended that the earthwork and foundation operations be monitored by the soils engineer, to test and evaluate the subgrade stability, bearing capacities, and the selection, placement and compaction of controlled fills. The Wisconsin DOT Standard Specifications for Highway and Structure Construction can also serve as a guide in implementing the subgrade preparation and other earthwork operations.



N

0 500 1,000

APPROXIMATE SCALE IN FEET

intertek psi

City of De Pere Roads and Utilities
Enterprise Drive
De Pere, Wisconsin

SCALE: SHOWN ABOVE

PROJECT NO: 0093510

FIGURE 1: BORING LOCATION PLAN

N

0 500 1,000

APPROXIMATE SCALE IN FEET

intertek psi	City of De Pere Roads and Utilities Charles Street De Pere, Wisconsin	**SCALE:** SHOWN ABOVE
		PROJECT NO: 0093510
	FIGURE 1: BORING LOCATION PLAN	**PAGE 2 OF 2**

SOIL BORING LOG: E - 1

Project: Proposed Road Reconstruction - City of De Pere

Location: Enterprise Drive
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 637.4	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
636.9	0-7": Concrete						
1 636.4	7-18": Brown CRUSHED STONE, with sand, moist (BASE COURSE)	1-SS	15	-	-	8	
635.9							
2 635.4	Brown SAND, with trace clay, moist						
634.9		2-SS	9	-	-	15	
3 634.4							
633.9							
4 633.4	Brown CLAY, with trace gravel, moist						
632.9		3-SS	23	4.5	5.4	18	
5 632.4							
631.9							
6 631.4							
630.9		4-SS	33	4.5	-	18	⊥
7 630.4							
629.9							
8 629.4							
628.9		5-SS	33	-	-	14	
9 628.4	END OF BORING @ 9± FEET						
627.9							
10 627.4							

FIELD OBSERVATIONS

Water Level $_{\text{during drilling}}$: Not Encountered ▽
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 7± feet below existing grade (EL. 630.4±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: E - 2

Project: Proposed Road Reconstruction - City of De Pere

Location: Enterprise Drive
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 642.3	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
641.8	0-7": Concrete						
	7-16": Brown CRUSHED STONE, with sand, moist (BASE COURSE)			-	-	3	
1 641.3		1-SS	22				
640.8				4.0	-	23	
	Reddish brown CLAY, with trace sand and gravel, moist						
2 640.3							
639.8							
3 639.3		2-SS	15	2.3	1.6	15	
638.8							
4 638.3							
637.8							
5 637.3		3-SS	21	4.5+	-	10	
636.8							
6 636.3							
635.8							
7 635.3		4-SS	37	-	-	8	
634.8							⊥
8 634.3							
633.8		5-SS	31	4.5+	-	16	
9 633.3							
	END OF BORING @ 9± FEET						
632.8							
10 632.3							

FIELD OBSERVATIONS

Water Level during drilling: Not Encountered ⊻
Water Level upon completion: Not Present ▼
Caved at upon completion: 7.5± feet below existing grade (EL. 634.8±) ⊥
Delay Time: N/A
Water Level delayed: N/A ¥
Caved at delayed: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: E - 3

Project: Proposed Road Reconstruction - City of De Pere

Location: Enterprise Drive
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 639.7	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
639.2	0-8": Concrete						
				-	-	4	
1 638.7	8-15": Brown CRUSHED STONE, with sand, moist (BASE COURSE)	1-SS	11				
638.2	Reddish brown CLAY, with trace sand and gravel, moist			2.5	-	15	
2 637.7							
637.2							
3 636.7		2-SS	19	4.3	-	16	
636.2							
4 635.7							
635.2							
5 634.7		3-SS	34	4.5+	8.9	14	
634.2							
6 633.7							
633.2							
7 632.7		4-SS	32	4.5+	6.6	18	
632.2							
8 631.7							⊥
631.2		5-SS	30	4.5+	-	15	
9 630.7	END OF BORING @ 9± FEET						
630.2							
10 629.7							

FIELD OBSERVATIONS

Water Level during drilling: Not Encountered ▽
Water Level upon completion: Not Present ▼
Caved at upon completion: 8± feet below existing grade (EL. 631.7±) ⊥
Delay Time: N/A
Water Level delayed: N/A ¥
Caved at delayed: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: E - 4

Project: Proposed Road Reconstruction - City of De Pere

Location: Enterprise Drive
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 638.3	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
637.8	0-7": Concrete						
1 637.3	7-12": Brown CRUSHED STONE, with sand, moist (BASE COURSE)	1-SS	9	-	-	7 17	
636.8	Brown CLAY, with trace sand and gravel, moist						
2 636.3							
635.8	Brown SAND, with trace clay, moist						
3 635.3		2-SS	21	-	-	14	
634.8							
4 634.3							
633.8	Reddish brown CLAY, moist						
5 633.3		3-SS	43	4.0	4.3	17	
632.8							
6 632.3							
631.8							
7 631.3		4-SS	36	4.5+	7.2	17	
630.8							
8 630.3							⊥
629.8		5-SS	34	3.5	-	18	
9 629.3	END OF BORING @ 9± FEET						
628.8							
10 628.3							

FIELD OBSERVATIONS

Water Level $_{\text{during drilling}}$: Not Encountered ▽
Water Level $_{\text{upon completion}}$: Not Present ▼
Caved at $_{\text{upon completion}}$: 8± feet below existing grade (EL. 630.3±) ⊥
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A ¥
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: C - 1

Project: Proposed Road Reconstruction - City of De Pere

Location: Charles Street
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/11/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 611.6	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 / 610.6	0-3": Asphalt 3-12": Dark brown CRUSHED STONE, with sand, moist (BASE COURSE) Dark bown to reddish brown CLAY, with gravel, moist (POSSIBLE FILL)	1-SS	12	-	-	5 17	
2 / 609.6							
3 / 608.6	Reddish brown CLAY, with trace sand, moist to very moist	2-SS	9	-	-	24	
4 / 607.6							
5 / 606.6							
6 / 605.6		3-SS	8	-	3.1	23	
7 / 604.6							
8 / 603.6		4-SS	9	2.8	2.5	29	
9 / 602.6							
10 / 601.6							
11 / 600.6		5-SS	6	2.3	1.4	29	
12 / 599.6							
13 / 598.6							
14 / 597.6		6-SS	4	0.5	-	31	⊥
15 / 596.6							
16 / 595.6							
17 / 594.6							
18 / 593.6							
19 / 592.6		7-SS	4	0.5	0.7	26	
20 / 591.6							
	END OF BORING @ 20± FEET						

FIELD OBSERVATIONS:

Water Level $_{during\ drilling}$: Not Encountered ⩒
Water Level $_{upon\ completion}$: Not Present ▼
Caved at $_{upon\ completion}$: 14± feet below ground surface (EL. 597.6±) ⊥
Delay Time: N/A --
Water Level $_{delayed}$: N/A ¥
Caved at $_{delayed}$: N/A ⊥

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: C - 2

Project: Proposed Road Reconstruction - City of De Pere

Location: Charles Street
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/11/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION — GROUND SURFACE ELEVATION: 611.9	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
611.4	0-7": Asphalt						
	7-10": Brown CRUSHED STONE, with sand, moist (BASE COURSE)					3	
1 / 610.9	Brown SAND, with trace gravel, moist (POSSIBLE FILL)	1-SS	11	-	-		
610.4						6	
2 / 609.9	Reddish brown CLAY, with trace sand, moist						
609.4							
3 / 608.9		2-SS	11	1.5	-	23	
608.4							
4 / 607.9							⊥
607.4							
5 / 606.9		3-SS	11	3.5	3.6	26	
606.4							
6 / 605.9							
605.4		4-SS	9	-	2.8	19	
7 / 604.9	END OF BORING @ 7± FEET						
604.4							
8 / 603.9							
603.4							
9 / 602.9							
602.4							
10 / 601.9							

FIELD OBSERVATIONS

Water Level during drilling: Not Encountered ▽
Water Level upon completion: Not Present ▼
Caved at upon completion: 4± feet below existing grade (EL. 607.9±) ⊥
Delay Time: N/A
Water Level delayed: N/A ¥
Caved at delayed: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: C - 3

Project: Proposed Road Reconstruction - City of De Pere
Location: Charles Street, De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/11/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION — GROUND SURFACE ELEVATION: 612.8	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 / 611.8	0-7": Asphalt 7-11": Brown CRUSHED STONE, with sand, moist (BASE COURSE) Dark brown CLAY, with trace root matter, moist (POSSIBLE BURIED TOPSOIL)	1-SS	9	-	-	8 21	
2 / 610.8							
3 / 609.8	Reddish brown CLAY, with sand, moist	2-SS	15	-	-	14	
4 / 608.8							
5 / 607.8							
6 / 606.8	Brown to yellowish brown CLAY, with sand, moist	3-SS	12	2.8	1.8	13	
7 / 605.8							
8 / 604.8		4-SS	8	1.5	1.7	17	
9 / 603.8							
10 / 602.8							
11 / 601.8	Reddish brown CLAY, moist	5-SS	6	2.3	2.1	24	
12 / 600.8							
13 / 599.8							⊥
14 / 598.8		6-SS	7	1.3	1.3	25	
15 / 597.8							
	END OF BORING @ 15± FEET						

FIELD OBSERVATIONS:

Water Level during drilling: Not Encountered ⊻
Water Level upon completion: Not Present ▼
Caved at upon completion: 13.5± feet below ground surface (EL. 599.3±) ⊥
Delay Time: N/A --
Water Level delayed: N/A ¥
Caved at delayed: N/A ⊥

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: C - 4

Project: Proposed Road Reconstruction - City of De Pere

Location: Charles Street
De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/11/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION: 612.8	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
612.3	0-6": Asphalt						
	6-12": Brown CRUSHED STONE, with sand, moist (BASE COURSE)					4	
1 611.8	12-16": Dark brown to black CLAY, moist (BURIED TOPSOIL)	1-SS	11	-	-		
611.3	Reddish brown CLAY, moist					9	
2 610.8							
610.3		2-SS	9	3.3	2.8	25	
3 609.8							
609.3							
4 608.8							⊥
608.3		3-SS	14	3.8	-	30	
5 607.8							
607.3							
6 606.8							
606.3		4-SS	11	2.8	3.7	28	
7 605.8							
	END OF BORING @ 7± FEET						
605.3							
8 604.8							
604.3							
9 603.8							
603.3							
10 602.8							

FIELD OBSERVATIONS

Water Level during drilling: Not Encountered ⊻
Water Level upon completion: Not Present ▼
Caved at upon completion: 4± feet below existing grade (EL. 608.8±) ⊥
Delay Time: N/A
Water Level delayed: N/A ¥
Caved at delayed: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

SOIL BORING LOG: C - 5

Project: Proposed Road Reconstruction - City of De Pere
Location: Charles Street, De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION — GROUND SURFACE ELEVATION: 614.3	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	0-6": Asphalt						
1 / 613.3	6-9": Brown CRUSHED STONE, with trace sand, moist (BASE COURSE)	1-SS	18	-	-	4	
2 / 612.3	Reddish brown CLAY, with trace sand and gravel, moist			2.0	-	22	
3 / 611.3	Reddish brown CLAY, with trace sand, moist	2-SS	11	3.5	3.4	22	
4 / 610.3							
5 / 609.3		3-SS	11	4.5	3.7	21	
6 / 608.3							
7 / 607.3		4-SS	10	3.5	3.5	28	
8 / 606.3							
9 / 605.3		5-SS	7	2.3	1.8	30	
10 / 604.3							
11 / 603.3							
12 / 602.3		6-SS	12	2.5	4.3	26	
13 / 601.3							
14 / 600.3							
15 / 599.3	**END OF BORING @ 15± FEET**						

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: Not Encountered
Water Level $_{\text{upon completion}}$: Not Present
Caved at $_{\text{upon completion}}$: 13.5± feet below ground surface (EL. 600.8±)
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

SOIL BORING LOG: C - 6

Project: Proposed Road Reconstruction - City of De Pere
Location: Charles Street, De Pere, Wisconsin

Project No.: 0093510
Drill Date: 12/12/2017
Drilled By: KD
Logged By: KH

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION — GROUND SURFACE ELEVATION: 630.1	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		0-5": Asphalt						
1	629.1	5-15": Brown CRUSHED STONE, with sand, moist (BASE COURSE)	1-SS	19	-	-	3	
2	628.1	Reddish brown to dark brown CLAY, with trace gravel, moist (POSSIBLE FILL)					19	
3	627.1	Reddish brown CLAY, with trace sand, moist	2-SS	11	2.5	-	16	
4	626.1							
5	**625.1**		3-SS	24	4.5+	7.4	15	
6	624.1							
7	623.1		4-SS	28	4.5+	7.4	16	
8	622.1							
9	621.1		5-SS	23	4.5+	7.4	22	
10	**620.1**							
11	619.1							
12	618.1							
13	617.1							
14	616.1	Reddish brown CLAY, with trace silt seams, moist	6-SS	12	3.8	3.7	24	
15	**615.1**							
16	614.1							
17	613.1							
18	612.1							
19	611.1		7-SS	9	2.3	1.7	31	
20	**610.1**							
21	609.1							
22	608.1							
23	607.1							
24	606.1		8-SS	9	1.5	1.4	41	
25	**605.1**							
		END OF BORING @ 25± FEET						

FIELD OBSERVATIONS:

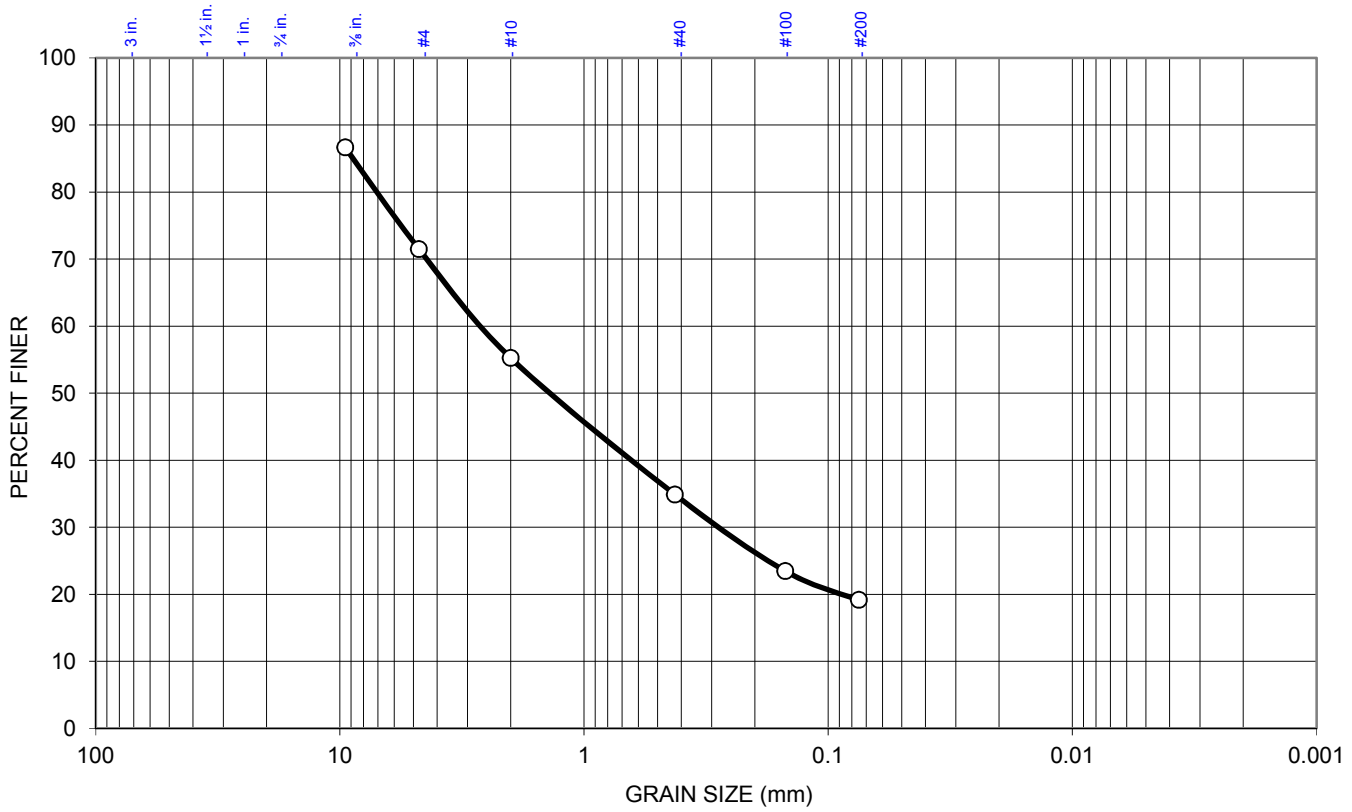
Water Level $_{\text{during drilling}}$: Not Encountered
Water Level $_{\text{upon completion}}$: Not Present
Caved at $_{\text{upon completion}}$: 23.5± feet below ground surface (EL. 606.6±)
Delay Time: N/A
Water Level $_{\text{delayed}}$: N/A
Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual.

Green Bay Office
2740-F Packerland Drive
Green Bay, Wisconsin 54313

Grain Size Distribution Report



% Cobbles (≥ 3")	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
	0	28	16	20	16	19.2

Sieve Size	Percent Finer	Specified Gradation*	Pass? (X=No)
3/8"	86.7		
#4	71.5		
#10	55.3		
#40	34.9		
#100	23.5		
#200	19.2		

* No specification provided

Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits: PL = LL = PI =

Coefficients: D_{85} = 9.00 D_{60} = 2.80 D_{50} = 1.59
D_{30} = 0.31 D_{15} = D_{10} =
C_u = C_c =

Classifications: USCS = SM AASHTO = A-1-b

Remarks:

CLIENT: City of De Pere **SAMPLE NO:** C-1 through C-3 **DATE:** 12/22/2017

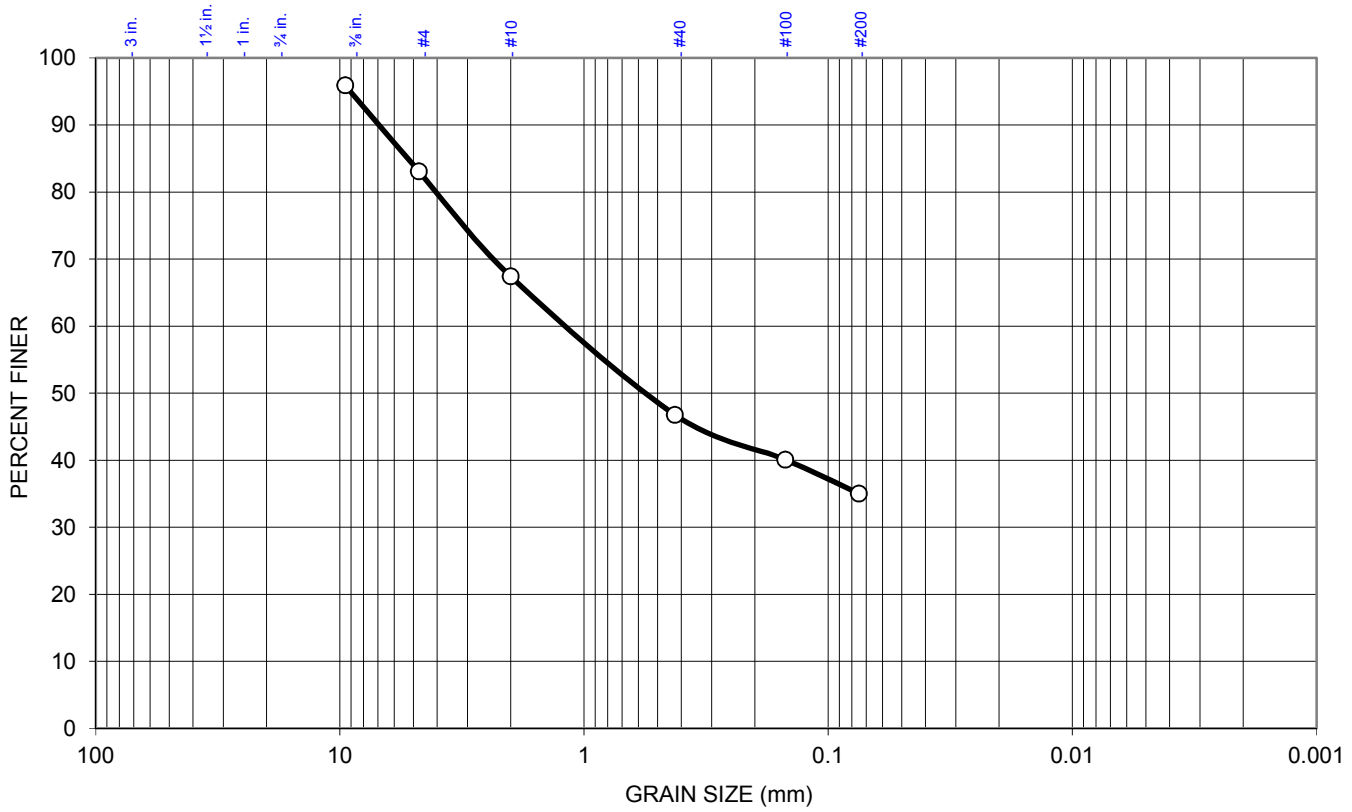
PROJECT: City of De Pere Roads **SAMPLE SOURCE:** Charles Street **EL./DEPTH:** 0-1'

PROJECT NO: 510 **PROPOSED USE:** Base Course **SAMPLED BY:** KD

Tested By: KD **QA/QC By:** CW

Green Bay Office
2740-F Packerland Drive
Green Bay, Wisconsin 54313

Grain Size Distribution Report



% Cobbles (≥ 3")	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
	0	17	16	21	12	35.0

Sieve Size	Percent Finer	Specified Gradation*	Pass? (X=No)
3/8"	95.9		
#4	83.1		
#10	67.4		
#40	46.8		
#100	40.1		
#200	35.0		

* No specification provided

Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits: PL = LL = PI =

Coefficients: D_{85} = 5.46 D_{60} = 1.43 D_{50} = 0.67
D_{30} = D_{15} = D_{10} =
C_u = C_c =

Classifications: USCS = SM AASHTO = A-2-4

Remarks:

CLIENT: City of De Pere **SAMPLE NO:** C-4 through C-6 **DATE:** 12/22/2017

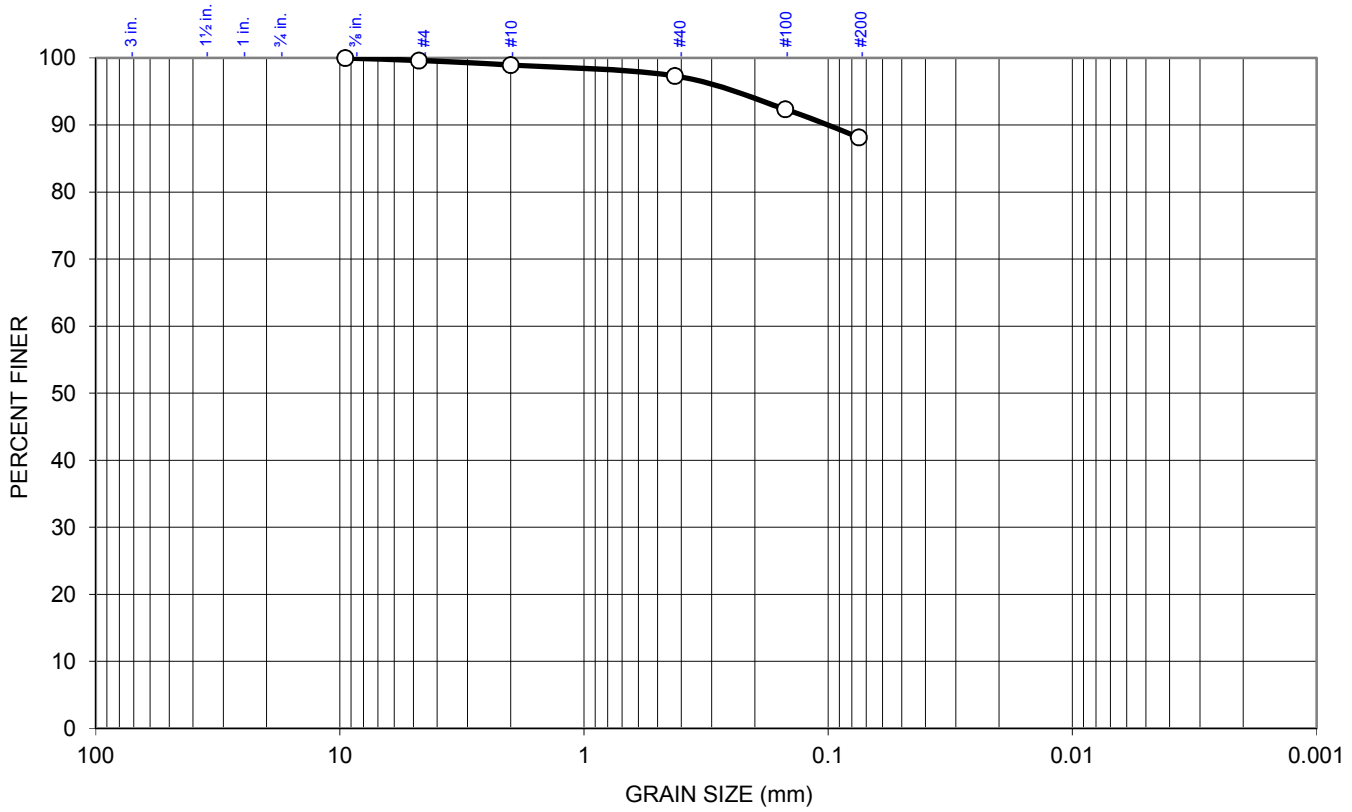
PROJECT: City of De Pere Roads **SAMPLE SOURCE:** Charles Street **EL./DEPTH:** 0-1'

PROJECT NO: 510 **PROPOSED USE:** Base Course **SAMPLED BY:** KD

Tested By: KD **QA/QC By:** CW

Green Bay Office
2740-F Packerland Drive
Green Bay, Wisconsin 54313

Grain Size Distribution Report



% Cobbles (≥ 3")	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
	0	0	1	2	9	88.2

Sieve Size	Percent Finer	Specified Gradation*	Pass? (X=No)
3/8"	100.0		
#4	99.6		
#10	99.0		
#40	97.3		
#100	92.4		
#200	88.2		

* No specification provided

Soil Description: Reddish brown LEAN CLAY, with trace sand

Atterberg Limits: PL = 18 LL = 38 PI = 20

Coefficients: D_{85} = D_{60} = D_{50} =
D_{30} = D_{15} = D_{10} =
C_u = C_c =

Classifications: USCS = CL AASHTO = A-6

Remarks:

CLIENT: City of De Pere **SAMPLE NO:** C-1 through C-6 **DATE:** 12/22/2017

PROJECT: City of De Pere Roads **SAMPLE SOURCE:** Charles Street **EL./DEPTH:** 1-4'

PROJECT NO: 510 **PROPOSED USE:** Subgrade **SAMPLED BY:** KD

Tested By: KD **QA/QC By:** CW

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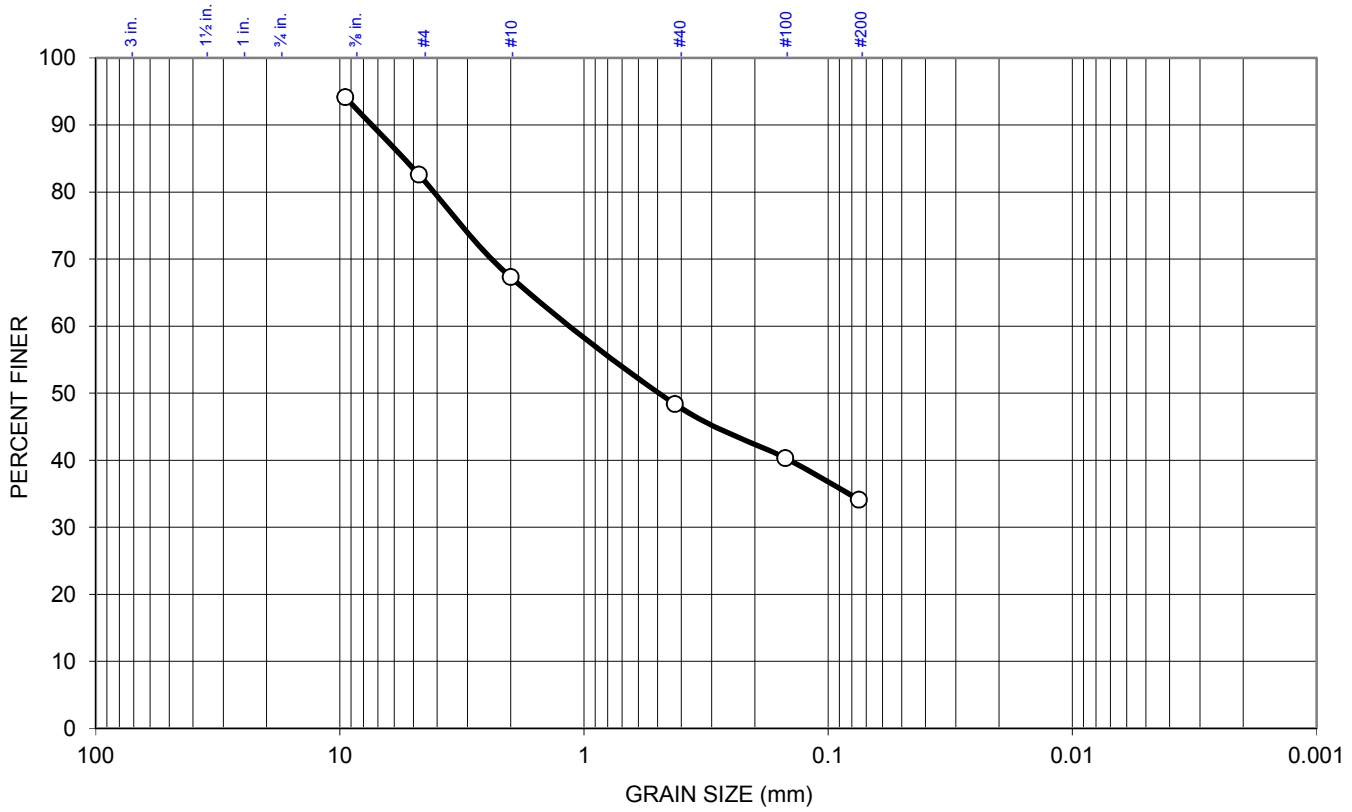
2740-F Packerland Drive
Green Bay, Wisconsin 54313

Grain Size Distribution Report



% Cobbles (≥ 3")	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
	0	17	15	19	14	34.1

Sieve Size	Percent Finer	Specified Gradation*	Pass? (X=No)
3/8"	94.2		
#4	82.6		
#10	67.3		
#40	48.4		
#100	40.3		
#200	34.1		

* No specification provided

Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits: PL = LL = PI =

Coefficients: D_{85} = 5.74 D_{60} = 1.39 D_{50} = 0.56
D_{30} = D_{15} = D_{10} =
C_u = C_c =

Classifications: USCS = SM AASHTO = A-2-4

Remarks:

CLIENT: City of De Pere **SAMPLE NO:** E-2 and E-4 **DATE:** 12/22/2017

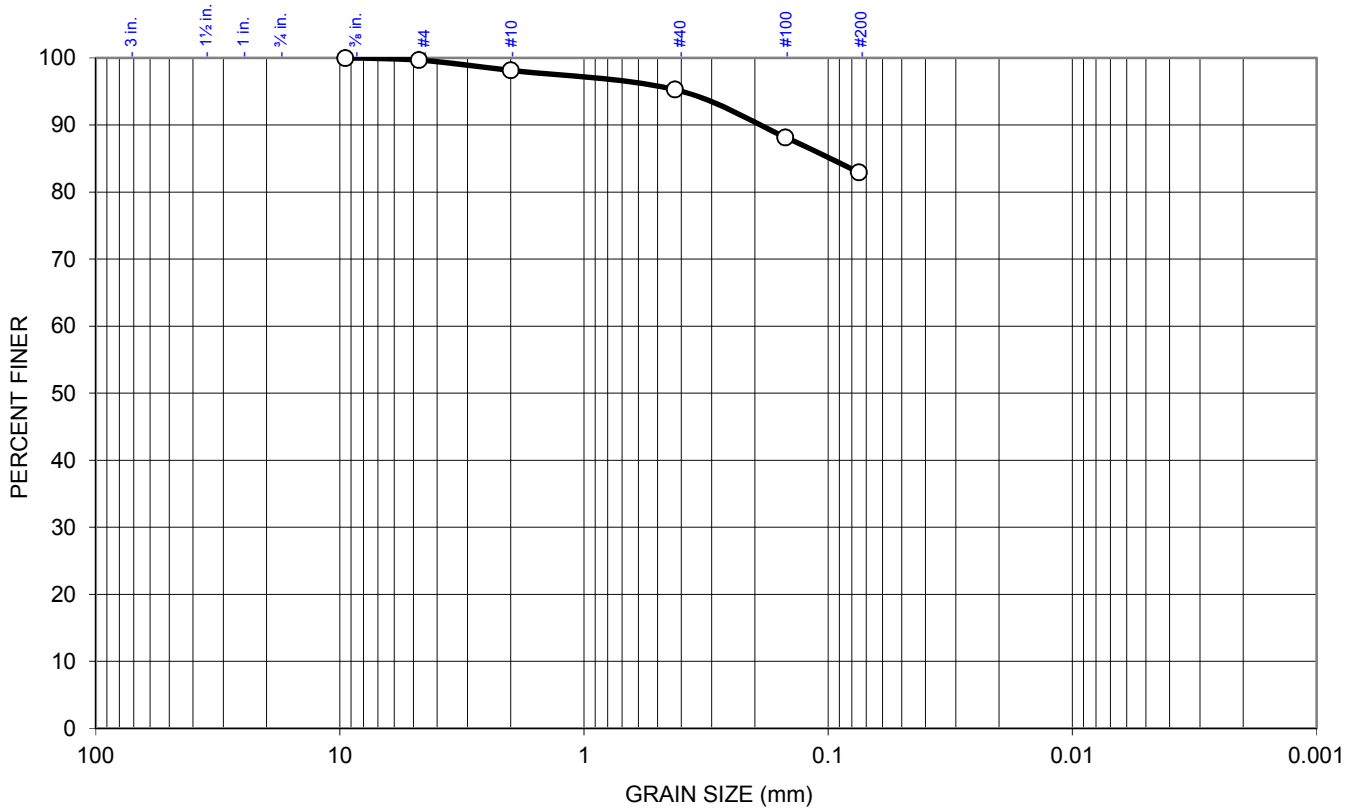
PROJECT: City of De Pere Roads **SAMPLE SOURCE:** Enterprise Drive **EL./DEPTH:** 0-1'

PROJECT NO: 510 **PROPOSED USE:** Base Course **SAMPLED BY:** KD

Tested By: KD **QA/QC By:** CW

Green Bay Office
2740-F Packerland Drive
Green Bay, Wisconsin 54313

Grain Size Distribution Report



% Cobbles (≥ 3")	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
	0	0	2	3	12	82.9

Sieve Size	Percent Finer	Specified Gradation*	Pass? (X=No)
3/8"	100.0		
#4	99.7		
#10	98.2		
#40	95.3		
#100	88.2		
#200	82.9		

* No specification provided

Soil Description: Reddish brown LEAN CLAY, with sand

Atterberg Limits: PL = 17 LL = 36 PI = 19

Coefficients: D_{85} = 0.10 D_{60} = D_{50} =
D_{30} = D_{15} = D_{10} =
C_u = C_c =

Classifications: USCS = CL AASHTO = A-6

Remarks:

CLIENT: City of De Pere **SAMPLE NO:** E-2 through E-4 **DATE:** 12/22/2017

PROJECT: City of De Pere Roads **SAMPLE SOURCE:** Enterprise Drive **EL./DEPTH:** 1-4'

PROJECT NO: 510 **PROPOSED USE:** Subgrade **SAMPLED BY:** KD

Tested By: KD **QA/QC By:** CW

GENERAL NOTES

SAMPLE IDENTIFICATION

1. Information on each log is a compilation of subsurface conditions, based on visual soil classifications of soil samples obtained from the field as assigned by a soils engineer, as well as from laboratory testing of samples, if performed. The strata lines on the logs may be approximate or the transition between the strata may be gradual rather than distinct. Water level measurements refer only to those observed at the times and locations indicated, and may vary with time, geologic condition and construction activity.
2. Unified Soil Classification System (USCS) designations are based on visual soil classification estimates on the basis of textural and particle size categorization and various soil behavior characteristics. If laboratory tests were performed to classify the soil, the USCS designation is shown in parenthesis.

USCS SOIL PARTICLE SIZE CLASSES

U.S. Std. Sieve			#200	#40	#10	#4	¾"	3"	12"	
Soil Type	Clay	Silt	Sand			Gravel		Cobbles	Boulders	
			Fine	Medium	Coarse	Fine	Coarse			
Millimeters	0.002	0.074	0.42	2	4.8	19	76	300		

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487-00)

Criteria for assigning group symbols and group names using laboratory tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve)	Gravels (More than 50% of coarse fraction retained on No. 4 sieve)	Clean gravels w/ < 5% fines [E]	Cu ≥ 4 and 1 ≤ Cc ≤ 3 [C]	GW	Well-graded gravel [D]
			Cu < 4 and/or1 > Cc > 3 [C]	GP	Poorly graded gravel [D]
		Gravels w/ > 12% fines [E]	Fines classify as ML or MH	GM	Silty gravel [D,F,G]
			Fines classify as CL or CH	GC	Clayey gravel [D,F,G]
	Sands (More than 50% of coarse fraction passes the No. 4 sieve)	Clean sands w/ < 5% fines [I]	Cu ≥ 6 and 1 ≤ Cc ≤ 3 [C]	SW	Well-graded sand [H]
			Cu < 6 and/or 1 > Cc > 3 [C]	SP	Poorly graded sand [H]
		Sands w/ > 12% fines [I]	Fines classify as ML or MH	SM	Silty sand [F,G,H]
			Fines classify as CL or CH	SC	Clayey sand [F,G,H]
FINE-GRAINED SOILS (More than 50% passes the No. 200 sieve)	Silts and clays w/ liquid limit (LL) < 50	Inorganic	PI > 7 and plots on or above "A" line [J]	CL	Lean clay [K,L,M]
			PI < 4 and plots below "A" line [J]	ML	Silt [K,L,M]
		Organic	LL (Oven dried) / LL (Not dried) < 0.75	OL	Organic clay [K,L,M,N]
				OL	Organic silt [K,L,M,O]
	Silts and clays w/ liquid limit (LL) ≥ 50	Inorganic	PI plots on or above "A" line	CH	Fat clay [K,L,M]
			PI plots below "A" line	MH	Elastic silt [K,L,M]
		Organic	LL (Oven dried) / LL (Not dried) < 0.75	OH	Organic clay [K,L,M,P]
				OH	Organic silt [K,L,M,Q]
HIGHLY ORGANIC SOILS		Primarily organic matter, dark in color, and organic odor		PT	Peat

[A] Based on the material passing the 3-inch (75 mm) sieve
[B] If field sample contained cobbles or boulders, or both, add " with cobbles or boulders, or both" to group name
[C] $Cu = D_{60}/D_{10}$; $Cc = (D_{30})^2 / D_{10} \times D_{60}$
[D] If soil contains ≥ 15% sand, add "with sand" to group name
[E] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM
[G] If fines are organic, add "with organic fines" to group name
[H] If soil contains ≥ 15% gravel, add "with gravel" to group name
[I] Sands with 5 - 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay
[K] If soil contains 15 - 29% plus No. 200, add "with sand" or "with gravel"
[L] If soil contains ≥ 30% plus No. 200, predominantly sand, add "sandy" to group name
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name
[N] PI ≥ 4 and plots on or above "A" line
[O] PI < 4 or plots below "A" line
[P] PI plots on or above "A" line
[Q] PI below "A" line

RELATIVE SOIL COMPOSITION

Trace - 0 - 15% of sample
With - 15 - 35% of sample
Soil modifier - > 35% of sample (i.e. sandy, silty, clayey, gravelly)

DRILLING & SAMPLING SYMBOLS

AU - Auger sample from cuttings
CS - Continuous ampler
HA - Hand auger sample
SS - Split spoon sample (2" O.D. by 1⅜" I.D.)
ST - Shelby Tube sample (2" or 3" O.D.)
WS - Wash sample from wash water return

SOIL PROPERTY SYMBOLS

N - N-value (blow count) is the standard penetration resistance based on the total number of blows required to advance a split spoon sampler one (1) foot, using a 140 lb. hammer with a 30 inch free fall. To avoid damage to sampling tools, driving is typically limited to 50 blows during any 6 inch interval. Additional description is provided below:

N-value (bpf)	Description
HW	Sampler penetrated soil under weight of hammer and rods; no driving required
25	25 blows to advance sampler 12 inches after initial 6 inches of seating
75/10"	75 blows to advance sampler 10 inches after initial 6 inches of seating
50/S3"	50 blows to advance sampler 3 inches during initial 6 inch seating interval

MC - Moisture content, %
Qu - Unconfined compressive strength, tons per square foot (tsf)
Qp - Calibrated hand penetrometer resistance, tsf
Dd - Dry density, pounds per cubic foot (pcf)
LL - Liquid limit, % (ASTM D4318)
PL - Plastic limit, % (ASTM D4318)
PI - Plasticity index, % (ASTM D4318)
%P200 - Percent of sample passing the No. 200 sieve
RQD - Rock quality designation of NX-size core sample
RMR - Rock mass rating, as developed by Z.T. Bieniawski
PID - Photoionization detector (Hnu meter) volatile vapor level, ppm

SOIL RELATIVE DENSITY & CONSISTENCY CLASSIFICATION

NON-COHESIVE SOILS		COHESIVE SOILS		
Density	N-Value Range	Consistency	Qu Range (tsf)	Approximate N-value Range
Very loose	0 - 3	Very soft	0 - 0.25	0 - 2
Loose	3 - 7	Soft	0.25 - 0.5	2 - 5
Medium dense	7 - 15	Medium stiff	0.5 - 1.0	5 - 10
Dense	15 - 38	Stiff	1.0 - 2.0	10 - 14
Very dense	38+	Very Stiff	2.0 - 4.0	14 - 32
		Hard	4.0+	32+

SOIL STRUCTURE TERMINOLOGY

Interlayered - Alternating layers of different soil types
Layer - Inclusion greater than 3 inches thick
Seam - Inclusion ⅛ to 3 inches thick
Laminated - Alternating seams of different soil type
Intermixed - Pockets of different soil types, no layering
Pocket - Inclusion of material of different texture
Varved - Alternating layers or seams of sand, silt, and/or clay

GROUNDWATER & MOISTURE CONDITIONS

v - Approximate groundwater level as noted during drilling and sampling
▼ - Groundwater level as noted within the open borehole upon removal of the augers
¥ - Delayed groundwater level within open borehole
Dry - Absence of moisture, dry to the touch
Moist - Damp, but no visible water
Wet - Visible free water, saturated, usually below water table

NOTE: General Notes have been adapted from and incorporate portions of ASTM D2487 "Classification of Soils for Engineering Purposes (Unified Soil Classification System)" and ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)."

Professional Service Industries, Inc.

ECS Midwest, LLC

Geotechnical Engineering Report

2019 Construction Design

Garrity's Glen South
College Avenue
James Street
Prosper Street
Ryan Road
De Pere, Brown County, Wisconsin

ECS Project Number 59:1549

December 17, 2018

December 17, 2018

Mr. Chase Kuffel
City of De Pere
925 South Sixth Street
De Pere, WI 54115
Email: ckuffel@mail.de-pere.org

ECS Project No. 59:1549

Reference: Geotechnical Engineering Report
2019 Construction Design
Garrity's Glen South
College Avenue
James Street
Prosper Street
Ryan Road
De Pere, Brown County, Wisconsin

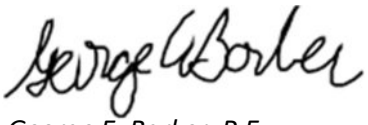
Mr. Kuffel:

ECS Midwest, LLC (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the above-referenced project. We performed our services in general accordance with our Proposal No. 59:203, dated February 1, 2018. This report presents our understanding of the geotechnical aspects of the project, the results of the field exploration and laboratory testing conducted, and our design and construction recommendations.

It has been our pleasure to be of service to the City of De Pere during the design phase of this project. We would appreciate the opportunity to remain involved during the remainder of the design phase, and we would like to provide our services during the construction phase to verify the assumptions of subsurface conditions made for this report. Please contact us should you have any questions concerning the information contained in this report, or if we can be of further assistance to you.

Respectfully submitted,

ECS Midwest, LLC



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APPENDICES

Appendix A – Drawings & Reports

- Site Location Diagram
- Boring Location Diagram

Appendix B – Field Operations

- Reference Notes for Boring Logs
- Test Boring Log 1 through 11
- Soil And Site Evaluation - Storm

Appendix C – Supplemental Report Documents

- Important Information about This Geotechnical-Engineering Report

EXECUTIVE SUMMARY

The main findings of the exploration are briefly summarized below. Information gleaned from the executive summary should not be utilized in lieu of reading the entire geotechnical report.

- The geotechnical exploration performed for the planned addition included eleven (11) standard penetration test borings. ECS drilled the borings to a depth of approximately 10 to 23 feet below the existing grade for a total of 173 feet.

- The borings generally encountered an asphalt or concrete pavement section at the surface, but Boring 1 through 4 contained a 6 to 8 inch topsoil layer. The generalized soil profile below the near surface layer consisted of existing FILL, which extended to a depth of between 2 and 5½ feet below the existing grade, and then lacustrine soils extended to the termination depth of the borings. However, Boring 1, 3, 9 and 11 did not contain existing fill strata. The encountered existing FILL consisted of lean clay, silty clay and sandy silty clay with organics. Further, the encountered lacustrine consisted of lean clay, fat clay, silty clay and silt soils.

- The drill crew observed a groundwater level in Boring 7 at a depth of 8 feet below the existing grade during drilling. The drill crew also observed a groundwater level in Boring 4 at a depth of 18 feet below the existing grade at the completion of drilling operations. However, none of the other borings contained a measureable groundwater level.

- The existing FILL exhibited a medium stiff to stiff consistency with SPT N-values ranging from 5 to 10 bpf (blows per foot). The lacustrine soils exhibited a very soft to very stiff consistency with SPT N-values ranging from 2 to 27 bpf and unconfined compressive strengths ranging from 0.25 to 5.5 tsf (tons per square foot).

- ECS recommends the removal of all existing fill and organic soils from below utility structures and pipes.

- ECS anticipates the encountered soils will remain in place below pavements unless the soils contain more than 5 percent organic content or proof-rolling operations indicate rutting or deflections in excess of 1 inch. Consideration should be given to providing Excavation Below Subgrade (EBS) for frost concerns where the exposed subgrade contains highly frost susceptible soil (e.g. silt, silty clay or sandy silty clay).

- In our opinion, initial attempts to control groundwater seepage into excavations could include a series of sump pits and pumps. However, if the groundwater level cannot be controlled with a series of sump pumps, or where excavations extend below the static groundwater level, then dewatering efforts will require a more substantial system (such as temporary well point system).

1.0 INTRODUCTION

1.1 GENERAL

ECS prepared this report for the purpose of providing the results of our subsurface exploration and laboratory testing, site characterization, engineering analysis, and geotechnical recommendations for the design and construction of utility infrastructure and pavements. The report also includes our recommendations concerning geotechnical subgrade preparation, fill placement, dewatering and construction considerations.

1.2 SCOPE OF SERVICES

ECS performed eleven (11) standard penetration test borings at the approximate locations shown on the site plan prepared by the City of De Pere, which was provided with the request for soil borings, dated November 1, 2018. We also implemented a limited laboratory-testing program to characterize the physical and engineering properties of the subsurface soils.

This report discusses our exploration and testing procedures, presents our findings and evaluations, and includes the following.

- A brief description of our field and laboratory test procedures and results.
- A description of the observed surface topographical features and site conditions.
- A description of area and site geologic conditions.
- A description of the interpreted subsurface soil stratigraphy with pertinent available physical properties.
- Copies of our records of subsurface exploration (test boring logs).
- Recommendations for design of pavements (rigid and flexible) including subgrade preparation, soil parameters for WisDOT pavement design and pavement drainage.
- Recommendations for storm water infiltration.
- Utility construction considerations.
- Recommendations for site preparation and construction of engineered fills, including an evaluation of on-site soils for use as compacted fills, and delineation of potentially unsuitable soils.
- Evaluation and recommendations relative to groundwater control.

1.3 AUTHORIZATION

ECS provided services in accordance with our Proposal No. 59:203, (dated February 1, 2018) and the "Agreement for Contractor Services – City of De Pere" authorized by Mr. Michael Walsh, Mayor and Ms. Shana Ledvina, Clerk-Treasurer (dated April 19, 2018), and includes the Terms and Conditions of Service outlined in the Proposal and Agreement.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The project sites are located in the City of De Pere, Brown County, Wisconsin. Specifically, the project sites are located at the following locations: proposed Garrity's Glen South subdivision; the portion of College Avenue that extends west of 4th Street; the portion of James Street between North Broadway Street and Wisconsin Street; the portion of Prosper Street between Enterprise Drive and South Broadway Street; and the portion of Ryan Road between South Melcorn Circle and Deer Point Lane. The site location is shown in Figure 2.1.1 and on the Site Location Diagram in Appendix A of this report.

Figure 2.1.1 Site Locations (outlined in red)

2.2 PAST SITE HISTORY/USES

ECS reviewed aerial photographs of the subject site dated 1992, 2005, 2006, 2008, 2010, 2011, 2015, 2017 and 2018. Based on our review of the aerial photographs, the site use at Garrity's Glen South appears to consist of agricultural land since at least 1992. Further, the site use at College Avenue, James Street, Prosper Street and Ryan Road appears to consist of asphalt or concrete paved street sections. These site uses appear to have remained relatively unchanged since at least 1992.

2.3 CURRENT SITE CONDITIONS

The site of the proposed construction consisted of an existing farm operation at Garrity's Glen South, an asphalt paved urban street section at College Avenue and James Street, a concrete paved urban street section at Prosper Street, and an asphalt paved rural roadway at Ryan Road at the time

of drilling. The ground surface generally consisted of nearly level to gently sloping soils across the sites. However, ECS did not determine the surface elevation at the boring locations.

2.4 PROPOSED CONSTRUCTION

ECS understands the proposed project will include new construction and reconstruction of existing municipal utilities and roadway pavements. Further, we anticipate the proposed pavements will consist of a concrete or bituminous pavement section, and the new vertical alignment will approximately match the existing alignment (less than 2 feet). The planned traffic volume was not provided to us at the time of this report. ***If the design changes, please notify ECS immediately so that we evaluate our recommendations and verify the recommendations are appropriate for the proposed construction.***

Where the borings encounter subsurface conditions that might be detrimental to the support of the proposed construction, ECS has assumed the owner will have an acceptable risk level if the detrimental material remains in place. With this in mind, this report assumes the owner would only be willing to accept a low risk for utility settlement in excess of 1 inch. In addition, we assume the owner would be willing to accept a moderate risk for reduced pavement performance. ***If these assumptions concerning the owner's acceptable risk level are incorrect, we should be immediately contacted so we can review our recommendations in light of the changed acceptable risk level.***

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

ECS used the boring depths and locations provided by Mr. Chase Kuffel, Assistant City Engineer of the City of De Pere, to characterize the project site in general geotechnical and geological terms, and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations.

3.1.1 Test Borings

ECS drilled eleven (11) standard penetration test borings within the limits of the proposed construction. The drill crew advanced four (4) of the borings to a depth of approximately 10 feet, one (1) to 15 feet, one (1) to 17 feet, one (1) to 18 feet, three (3) to 20 feet, and one (1) to 23 feet below the existing grade. We performed the borings with a truck vehicle mounted rotary drill rig utilizing continuous flight hollow stem augers (HSA).

ECS personnel identified the test boring locations in the field using a measuring tape relative to existing site features. The approximate as-drilled test boring locations are shown on the Boring Location Diagram in Appendix A of this report. However, our scope did not include obtaining the surface elevation at the boring locations.

The drill crew conducted standard penetration tests (SPTs) in the boreholes at regular intervals in general accordance with American Society for Testing Materials (ASTM) D1586 (American Association of State Highway and Transportation Officials (AASHTO) T206). The obtained standard penetration resistances provide a general indication of soil relative density and consistency. The drill crew chief visually and manually classified the samples in the field in accordance with ASTM: D2488. Field personnel then collected representative soil samples and returned them to the laboratory for further observation and verification of the field classification.

Some borehole backfill settlement or expansion can and will occur over time. Monitoring the boreholes after the initial drilling activities is not within our scope. Settlement or expansion of the borehole backfill can create a hazard and should be carefully monitored by the client.

3.2 SOIL SURVEY MAPPING

Based on our review of the Soil Survey from the USDA - Natural Resources Conservation Service (websoilsurvey.nrcs.usda.gov), which provides soil information to a shallow depth (generally less than 5 feet), the site soils are generally mapped as Fill land (Fd), Manawa silty clay loam (McA), Oshkosh sandy loam (OmB), Oshkosh silt loam (OnA and OnB), Oshkosh silty clay loam (OsA) and Poygan silty clay loam (Po). These soil types are described with the following properties.

- Fill land (Fd) – Landforms consisting of human transported materials of various soil types. These soils are generally well drained and have a moderate potential for frost action. This soil type is mapped in the area of Boring 7.

- Manawa silty clay loam (McA) – Landforms consisting of drainageways with clayey till, and/or calcareous, dense clayey till. These soils are generally somewhat poorly drained, classified as being in Hydrologic Soil Group D, and have a moderate potential for frost action. This soil type is mapped in the area of Boring 8.

- Oshkosh sandy loam (OmB) – Landforms consisting of glacial lakes with silty loess over clayey lacustrine deposits. These soils are generally well drained, classified as being in Hydrologic Soil Group C, and have a moderate potential for frost action. This soil type is mapped in the area of Boring 5 and 6.

- Oshkosh silt loam (OnA and OnB) – Landforms consisting of glacial lakes with silty loess over clayey lacustrine deposits. These soils are generally well drained, classified as being in Hydrologic Soil Group C, and have a moderate potential for frost action. This soil type is mapped in the area of Boring 9, 10 and 11.

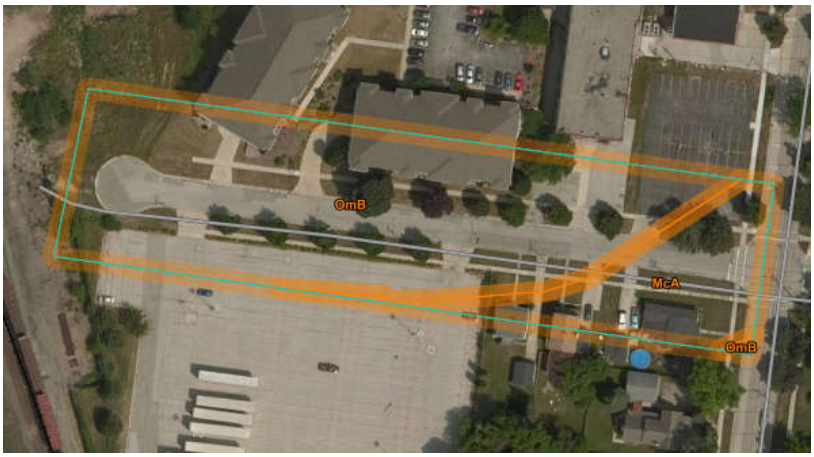
- Oshkosh silty clay loam (OsA) – Landforms consisting of glacial lakes with silty loess over clayey lacustrine deposits. These soils are generally well drained, classified as being in Hydrologic Soil Group C, and have a moderate potential for frost action. This soil type is mapped in the area of Boring 1, 2 and 4.

- Poygan silty clay loam (Po) – Landforms consisting of depressions with silty and clayey till. These soils are generally poorly drained, classified as being in Hydrologic Soil Group C/D, and have a high potential for frost action. This soil type is mapped in the area of Boring 3.

Soil mapping of the site vicinity is presented in the following figures.

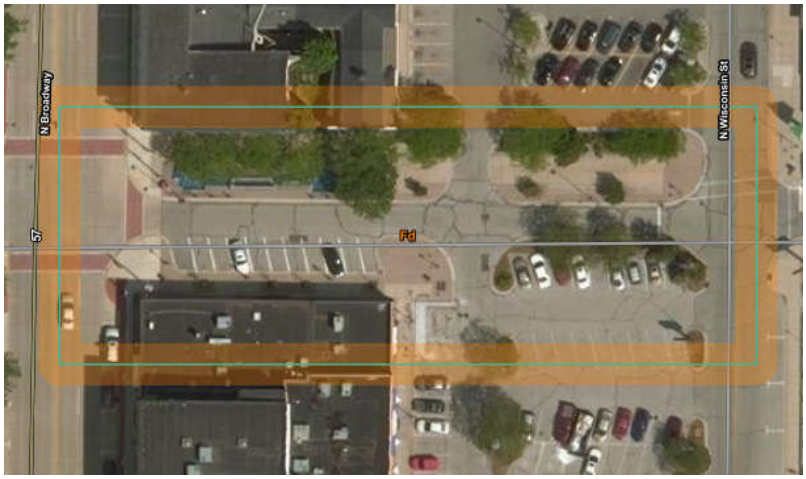
(Source: USDA - Natural Resources Conservation Service)

Figure 3.3.1 Soil Survey Information (Garrity's Glen South)



(Source: USDA - Natural Resources Conservation Service)

Figure 3.3.2 Soil Survey Information (College Avenue)



(Source: USDA - Natural Resources Conservation Service)

Figure 3.3.3 Soil Survey Information (James Street)

(Source: USDA - Natural Resources Conservation Service)

Figure 3.3.4 Soil Survey Information (Prosper Street)

(Source: USDA - Natural Resources Conservation Service)

Figure 3.3.5 Soil Survey Information (Ryan Road)

3.4 SUBSURFACE CHARACTERIZATION

The encountered subsurface conditions in the borings closely match published geological mapping. Table 3.4.1 of this report provides generalized characterizations of the soil strata encountered during our subsurface exploration. For subsurface information at a specific test boring location, refer to the boring logs in Appendix B of this report.

Table 3.4.1 Subsurface Stratigraphy

Approximate Depth Range (feet)	Strata	Description	SPT[(1)] N-value Range (bpf)	Unconfined Comressive Strength[(2)] (tsf)
Surface	--	Approximately 6 to 8 inch thick topsoil layer at Boring 1 through 4, and 7 to 23 inch thick asphalt or concrete pavement section at Boring 5 through 11.	N/A	N/A
2 - 5½	I	FILL: lean clay (CL), silty clay (CL-ML) and sandy silty clay (CL-ML) with organics, medium stiff to stiff	5 - 10	N/A
10 - 23	II	Lacustrine: lean clay (CL), fat clay (CH), silty clay (CL-ML) and silt (ML), very soft to very stiff	2 - 27	0.25 - 5.5

Notes: (1) Standard Penetration Test.
(2) Based on calibrated hand penetrometer test

Because the drill crew used discontinuous material sampling intervals at the test borings, we inferred conditions between sample intervals. The soil stratification shown on the boring logs represents the interpreted soil conditions at the actual boring locations. Variations in the

stratification can occur between sample intervals and boring locations. The subsurface conditions at other times and locations on the site may differ from those found at the boring locations. If different site conditions are encountered during construction, then ECS should be contacted to review our recommendations relative to the new information.

Because of the limitations of the split-spoon sampler, which has a 1⅜-inch inside diameter, the soil classifications noted on the boring logs may not be representative of the entire soil matrix. Materials larger than the 1⅜-inch inside diameter of the split-spoon sampler cannot be collected and observed directly. Where possible, the drill crew noted the estimated depth of larger diameter materials, such as cobbles, based on things such as changes in the observed drilling resistance and auger cuttings.

3.5 GROUNDWATER OBSERVATIONS

The drill crew observed a measureable groundwater level in Boring 7 at a depth of 8 feet below the existing grade during drilling and in Boring 4 at a depth of 18 feet at the completion of drilling operations. However, none of the other borings contained a groundwater level.

Variations in the long-term water table elevation may occur as a result of seasonal variations in precipitation, evaporation, surface water runoff, lateral drainage conditions, construction activities, and other factors. The time of year and the weather history during the advancement of the borings should be considered when estimating groundwater levels at other points in time.

4.0 LABORATORY TESTING

The laboratory testing performed by ECS for this project consisted of select tests performed on samples obtained during our field exploration operations. The following paragraphs briefly describe the results of the completed laboratory testing program. We performed classification and index property tests on representative soil samples obtained from the test borings to aid classification of the soils, and to help estimate engineering properties.

A geotechnical engineer visually classified each collected soil sample from the test borings on the basis of texture and plasticity using the Unified Soil Classification System (USCS) and ASTM D2488 (AASHTO T206), Standard Practice for Description and Identification of Soils (Visual-Manual Procedures) as a general guideline. After classification, the geotechnical engineer grouped the various soil types into the major zones noted on the test boring logs in Appendix B of this report. The group symbols for each soil type are indicated in parentheses before the soil descriptions on the test boring logs. The bracketed text noted on the boring logs after the group symbols indicates the AASHTO Classification. The stratification lines designating the interfaces between earth materials on the test boring logs are approximate; in-situ, the transitions may be gradual.

Calibrated hand penetrometer tests (Qp) were also performed on cohesive soil samples to estimate the soil's unconfined compressive strength. In the hand penetrometer test, the unconfined compressive strength of a soil sample is estimated, to a maximum of 6.0 tons per square foot (tsf), by measuring the resistance of a soil sample to penetration by a small, calibrated, spring-loaded cylinder. Although unconfined compressive strength does not relate directly to pavement design equations, ECS utilizes this information for comparative strength of soil layers. The hand penetrometer test results can be found on the boring logs adjacent to the number of the tested sample included in Appendix B of this report.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposal.

5.0 DESIGN RECOMMENDATIONS

5.1 PAVEMENT DESIGN CONSIDERATIONS

Subgrade Characteristics: The pavement design recommendations assume the subgrade consists of suitable materials evaluated by ECS, and the subgrade is prepared as recommended in the **Subgrade Preparation** and **Earthwork Operations** sections of this report.

Based on the results of our soil borings, ECS recommends the use of the pavement subgrade design parameters noted in Table 5.1.1 of this report, which provides values for the first suitable soil strata encountered in the borings. ECS obtained the values for the Soil Support Value and Design Group Index from the WisDOT Pavement Design Manual and Frost Index values from the frost susceptibility classifications according to the U.S. Army Corps of Engineer's criteria. We estimated the Subgrade and Resilient Modulus values based on historical testing of similar soil. For grading work and drainage design, shrinkage should be in the range of 20 to 35 percent for the encountered soils. These values correlate to expansion factors of 25 to 54 percent. For design purposes we recommend using an average shrinkage factor of 25 percent (33 percent expansion factor).

Table 5.1.1 Recommended Pavement Subgrade Design Parameters [1, 2]

Boring Number	Location [3]	Soil Classification		Subgrade Reaction Modulus, K (psi/in)	Resilient Modulus, M_R (psi)	Frost Index	Soil Support Value	Design Group Index
		USCS	AASHTO					
1	Garrity's Glen South	CL	A-6	125	2,800	F-3	4.2	12
2	Garrity's Glen South	CL [FILL][3]	A-6	125	2,800	F-3	4.2	12
3	Garrity's Glen South	CL	A-6	125	2,800	F-3	4.2	12
4	Garrity's Glen South	CL [FILL][3]	A-6	125	2,800	F-3	4.2	12
5	College Avenue	CL-ML [FILL][3]	A-4	125	2,800	F-4	3.9	14
6	College Avenue	CL-ML [FILL][3]	A-4	125	2,800	F-4	3.9	14
7	James Street	CL [FILL][3]	A-6	125	2,800	F-3	4.2	12
8	Prosper Street	CL [FILL][3]	A-6	150	3,000	F-3	4.2	12
9	Prosper Street	CL	A-6	175	3,300	F-3	4.2	12
10	Ryan Road	CL [FILL][3]	A-6	125	2,800	F-3	4.2	12
11	Ryan Road	CL	A-6	150	3,000	F-3	4.2	12

Notes:
1. All design parameters are estimates only, and are based on historical data for similar soil types. If more accurate values are required, additional testing should be performed.
2. Design parameters are for the first suitable soil strata below the proposed pavement elevation encountered in the borings. If more than 2 feet of sub-base fill material is placed, the characteristics of the fill will govern the pavement design.
3. Denotes existing fill which, understanding the risks noted in the **Subgrade Preparation** section of this report, is suitable to support the proposed pavement section.

Areas of subgrade stabilization and/or undercut may be needed because of the potentially variable support of the existing fill, especially if the subgrade is subjected to construction traffic disturbance or if construction is during adverse weather conditions. A reduced service life, increased pavement maintenance and associated costs should be expected because of the existing fill subgrade. In addition, consideration should be given to providing Excavation Below Subgrade (EBS) for frost concerns in areas where the exposed subgrade contains highly frost susceptible soil (e.g. silt, silty clay or sandy silty clay).

The ends of over-excavated areas should be sloped across a minimum length of 10 feet to reduce the potential abrupt changes in the pavement support characteristics that could lead to future pavement distress. Furthermore, in areas requiring over-excavation for detrimental frost concerns and in trenches for utilities, ECS recommends constructing transition zones, which are wedges of backfilled soil used to mask the distinct difference between the native soils and the backfilled area (such as trenches for utilities). The transition zone should start at the trench walls, and a depth of 3 feet below the finished pavement, and rise at a slope of 1 vertical to 3 horizontal as it extends perpendicular to the trench. However, transition zones would not be necessary where EBS areas are backfilled with soils similar to the native soils, or where the native soils contain less than 30 percent material passing the #200 sieve.

Prior to placing the aggregate base material, the pavement subgrade should be prepared as recommended within this report. Crushed aggregate base course utilized below pavements should meet Section 305 of the WisDOT Standard Specifications for Road and Bridge Construction and the gradation should meet the "1¼ inch" specification. The crushed aggregate base course should be compacted to at least 95 percent of the maximum dry density obtained in accordance with ASTM D1557, Modified Proctor method. As an alternative, a dense graded base meeting the "3 inch" specification can be used for the lower 8 inches of the base course layer to bridge over softer subgrade soils.

The aggregate used in the bituminous mixture should meet the 19.0 mm gradation for the lower pavement layer and the 12.5 mm gradation for the upper pavement layer as specified in Section 460 of the WisDOT Standard Specifications for Road and Bridge Construction. The asphalt pavement should be compacted to a minimum of 93 percent of the theoretical density value.

Adequate construction joints, contraction joints and isolation joints should be provided in the areas of rigid pavement to reduce the impacts of cracking and shrinkage. Please refer to ACI 330R-92 *Guide for Design of Concrete Parking Lots*. The Guide recommends an appropriate spacing strategy for the anticipated loads and pavement thickness. It has been our experience that joint spacing closer to the minimum values results in a pavement with less cracking and better long-term performance.

Weather Restrictions: In this region, asphalt plants may close during the months of December through March, and/or April if particularly cold weather conditions prevail. However, this can change based on year to year temperature fluctuations. Daily temperatures from December to March will often stay below 40°F, limiting the days that asphalt placement can occur.

Pavement Drainage: An important consideration with the design and construction of pavements is surface and subsurface drainage. Where standing water develops, either on the pavement surface or within the base course layer, softening of the subgrade and other problems related to the

deterioration of the pavement can be expected. The final pavement surface should be shaped or crowned to properly direct surface water to suitable on or off-site stormwater drainage infrastructure. In addition, the silty and clayey pavement subgrade should be properly sloped to avoid dips or pockets where water may become trapped. Dips in the silty or clayey subgrade could result in a "bathtub" effect, which may trap water and potentially soften the subgrade. Good drainage should help reduce the possibility of the subgrade materials becoming saturated over a long period of time.

Infiltration and subterranean water are generally the main sources of water that should be considered in the design of the pavement. Infiltration is surface water that enters the pavement through the joints, pores or cracks in the pavement, and through shoulders and areas adjacent to pavements as a result of precipitation. Subterranean water is a source of water from a high water table on the site. Based on our estimated groundwater level, we consider surface water infiltration to be the main source of water to be considered for pavement design on this project.

To reduce the potential for shallow perched water to develop in areas of the site, "stub" or "finger" drains should be considered around catch basins and in other low-lying areas to reduce the accumulation of water above and within the subgrade soils and aggregate base. As an alternative to the use of stub or finger drains, existing manholes and storm sewer inlets could be perforated with 1-inch diameter holes at 2-foot centers, and the manhole/inlet wrapped with a non-woven geotextile to reduce migration of material into the manhole/inlet. The holes could be placed at 90 degree intervals around the perimeter of the manhole, and the excavation around the manhole backfilled with free draining granular materials.

Sheet drainage across large pavement areas allows more water to enter the pavement through openings, cracks and weak points over time, which can adversely affect the base course and subgrade. This can increase the potential risk of premature pavement deterioration, distress and long-term pavement maintenance issues. Intermediate drains should be installed at adequate intervals to reduce the length of sheet flow across the pavement surface.

Pavement Maintenance: A sound maintenance program should be implemented to help maintain and enhance the performance of pavements, and help attain the design service life. A preventative maintenance program should be implemented early in the pavement life to be effective. The "standard in the industry" supported by research indicates that preventative maintenance should typically begin within 2 to 5 years of the placement of pavement. However, maintenance of pavement on undocumented fill sites may require more maintenance and sooner. Failure to perform preventative maintenance will reduce the service life of the pavement, and increase the costs for corrective maintenance and full pavement rehabilitation. To help reduce water infiltration thru the pavement section into the base course layer, which may result in softening of the subgrade and deterioration of the pavement, we recommend timely sealing of pavement joints and cracks with elastomeric caulk. We recommend exterior pavements be observed for distresses, such as cracks, depressions and poor drainage, at least twice a year, typically once in the spring and fall.

5.2 INFILTRATION DESIGN CONSIDERATIONS

The recommendations presented in this section follow the general guidelines of WDNR Conservation Practice Standard 1002, Site Evaluation for Stormwater Infiltration.

ECS understands a storm water management device would likely be constructed in the area of Boring 3 and 4. The "Soil and Site Evaluation – Storm" log included in Appendix B of this report indicate the storm water design parameters for each soil strata encountered in these borings. We determined the design infiltration rate using Table 2 of the Wisconsin Department of Natural Resources Conservation Practice Standards "Site Evaluation for Storm Water Infiltration (1002)".

Design Infiltration Rates: Based on the results of the exploration, the borings encountered soils that have a USDA soil classification of clay (c). Based on the soil textural classification and the guidelines provided in Table 2 of the WDNR Conservation Practice Standard 1002, the infiltration rate of the clay soils encountered in the borings is 0.07 inches per hour. The soil infiltration rate for each soil strata encountered in the borings can be found on the ***Soil and Site Evaluation – Storm*** form included in Appendix B of this report. Infiltration rates based on soil textural classification and the guidelines provided in Table 2 of the WDNR Conservation Practice Standard 1002 should be adjusted for the least permeable soil layer within 5-feet of each of the listed intervals.

Estimation of the final design infiltration rate should consider the effects of any engineered fill placed, surface vegetation, erosion control devices, and potential groundwater mounding. Prior to and during construction, the design infiltration rate of the soil at the basin bottom should be verified. Compaction of the basin bottom subgrade during and following construction should be prevented as this may reduce the infiltration rate of the soil. This may require exclusion of construction traffic from the infiltration bottom, or loosening of the subgrade soil, such as by raking or discing. Sediment allowed to accumulate at the basin bottom will reduce infiltration. Measures should be taken to reduce accumulation of sediment. Periodic removal of sediment should be expected.

Infiltration Feasibility: Based on the conditions encountered in the test borings, the site is considered to have a low capacity for the infiltration of storm water because of the predominant clayey soils encountered at the test boring locations. In accordance with Section V, Step C5 of the Wisconsin Department of Natural Resources (WDNR) Conservation Practice Standard 1002, the clayey soils have a correlated infiltration rate of 0.07 inches per hour, which is less than 0.6 inches per hour, and as such, these soils are anticipated to be exempt from the infiltration requirements per section NR 151.12(5)(c)6.a of the Wisconsin Administrative Code. In addition, if the bottom of the infiltration device extends to within 5 feet of the highest groundwater level noted in the borings, the location of the boring would be excluded from the infiltration requirements based on Chapter NR 151.12(5)(c)5.f of the Wisconsin Administrative Code.

Our scope of services is not inclusive of all steps involved in the initial site screening (Part A) of the WDNR Technical Standard 1002. Therefore, other conditions may exist at, or near the site that could exclude or exempt the site, or portions of the site from the infiltration requirements. Additional evaluation must be conducted prior to the design and implementation of an infiltration device at this site so that its construction meets Wisconsin Administrative Code requirements.

Details of the proposed storm water management device were not available at the time of this report preparation; it is recommended ECS be provided the storm water management plans, when available, to check that the recommendations provided herein are applicable. ECS should also be called on to provide observation and testing during infiltration basin construction.

6.0 SITE CONSTRUCTION RECOMMENDATIONS

6.1 SUBGRADE PREPARATION

6.1.1 Existing Utilities

ECS recommends utilities not reused should be capped-off and removed or properly abandoned in-place in accordance with local codes and ordinances. The excavations for utilities to be removed in the influence zone of new construction are recommended to be backfilled with engineered fill. Grading operations must be done carefully so that existing utilities are not damaged or disturbed. Utility invert elevations, depths and sizes should be checked relative to the planned utility and pavement elevations to determine what specific concerns are present.

6.1.2 Stripping and Initial Site Preparation

The subgrade preparation should consist of stripping all pavement to be removed, organic soils (topsoil) and any other soft or unsuitable materials from the 5-foot expanded pavement limits and 5 feet beyond the toe of engineered fills, where feasible. ECS should be called on to observe and document that topsoil and other unsuitable surficial materials have been removed prior to the placement of engineered fill or construction of structures. Please note, topsoil removal should not be based on soil coloration alone. After removal of the root mat, it may be possible to leave some darker soils in place provided the soil contains no more than 5 percent organic matter as determined by ASTM D2974, has the recommended strength characteristics and is stable under proofroll. A landscape architect should approve any topsoil or other materials proposed for use in future landscape areas.

6.1.3 Special Subgrade Preparations – Utilities

The existing fill encountered in the borings present concerns for the support of utility pipes and structures. The existing fill extended to a depth of between 2 and 5½ feet below the existing grade. The owner should be aware of an increased risk of settlement in excess of 1 inch associated with the construction of utilities on these soils. In our opinion, the risk would be high for utilities constructed on undocumented fill. Based on the anticipated acceptable risk level of the owner, ECS recommends the removal of all existing fill from below utility pipes and structures.

Excavations subcut below the proposed pipe or structure elevation should be oversized one foot horizontally in each direction for every foot of sub-base fill placed below the pipe or structure, to a maximum oversize of 3 feet on each side of the pipe. All over-excavated soils should be replaced with properly compacted engineered fill.

6.1.4 Special Subgrade Preparations – Pavements

In general, pavements derive their strength from the characteristics of the subgrade soils, the sub-base fill and the base course, and the concrete or bituminous upper layer and lower layer mixtures. In the design of the pavement, the total pavement thickness typically includes the concrete or bituminous mixtures, base course, and sub-base fill. The site has generally suitable conditions for the proposed pavement construction. However, the existing fill and frost susceptible soils encountered in the borings present concerns for the pavement performance.

Existing Fill: The existing fill encountered in the borings extended to a depth of between 2 and 5½ feet below the existing grade. The existing fill provides a concern for the performance of the pavement system. The owner should be aware of the increased risk for a reduced pavement performance associated with constructing pavements on undocumented fill. The risk exists because undocumented fill has a higher potential for variable density. In addition, this risk tends to increase with the presence of organic soils (more than 5% organics). However, because of natural soil variability, every construction site has at least a very low risk for a reduced pavement performance.

Based primarily on the standard penetration N-values, in ECS's opinion, the risk for reduced pavement performance associated with the existing fill at this site would generally be moderate to high. However, the risk could be reduced to a low risk if the existing fill contains less than 5 percent organic content *and* proof-rolling observations do not indicate rutting or deflection greater than 1 inch. Based on our assumption of the owner's acceptable level of risk, we recommend removing any existing fill which contains greater than 5 percent organic content or does not meet the above proof-rolling requirements from within 2 feet of the finished pavement grade. The removed material should then be replaced with a compacted engineered fill in accordance with the **Earthwork Operations** section of this report.

Frost Susceptible Soils: The frost susceptible clayey and silty soils encountered in the borings provide another concern for the pavement system. ECS wishes to note, a risk for reduced pavement performance exists with the construction of pavements on frost susceptible soil. The reduced pavement performance may occur because of potential detrimental frost heaving and spring thaw weakening. The risk associated with frost susceptible soils can be reduced by removal of all frost susceptible soils within 3 feet of the finished pavement grade. In our opinion, the risk at this site related to the frost susceptible soils would generally be moderate. However, the risk would be high to very high in areas where highly frost susceptible silt, silty clay, or sandy silty clay soil is present within 3 feet of the finished pavement grade.

Summary: Based on our assumption of the owner's acceptable risk level (as outlined in the "Project Information" section of this report), we recommend the following:

1. Remove all existing fill soils from within 2 feet of the finished pavement grade, unless it contains less than 5 percent organic content *and* proof-rolling observations do not indicate rutting or deflection greater than 1 inch.

2. All over-excavated material should be replaced with compacted engineered fill in accordance with the **Earthwork Operations** section of this report.

3. If the owner is willing to accept a moderate risk for reduced pavement performance, then we anticipate a majority of the frost susceptible soils will remain in place below pavements. However, we recommend removing all highly frost susceptible soils (e.g. silt, silty clay and sandy silty clay) from within 3 feet of the finished pavement grade.

6.1.5 Proofrolling

After the removal of all unsuitable surface materials, cutting to the proposed subgrade, and prior to the placement of any engineered fill or other construction materials, the exposed subgrade should be observed by ECS. The contractor should thoroughly proofroll the exposed subgrade with previously approved construction equipment having a minimum axle load of 10 tons (e.g. fully loaded tandem-axle dump truck in clayey soils or large smooth drum roller in sandy soils). The contractor should traverse the areas subject to proofrolling by the equipment in two perpendicular (orthogonal) directions with overlapping passes of the vehicle under the observation of ECS. This procedure is intended to assist in identifying any localized yielding materials. Unstable or pumping subgrade areas identified during the proofroll should be marked for repair prior to the placement of any subsequent engineered fill or other construction materials. Unstable subgrade repair methods, such as undercutting or moisture conditioning or chemical stabilization, should be discussed with ECS to determine the appropriate procedure(s) with regard to the existing conditions causing the instability. A test pit(s) may be excavated to explore the shallow subsurface materials in the area of the instability to aid in determining the cause of the observed unstable materials and to assist in the evaluation of the appropriate remedial action to stabilize the subgrade.

Near surface subgrade soils having a high moisture content and/or those having N-values less than 10 bpf may not pass a proofroll, and may need to be undercut or repaired. Some undercutting or repair of unstable subgrade soils should be anticipated during pavement subgrade preparation. If construction will occur during wet times of the year (such as during the spring or fall months) or immediately following extended periods of rain, then seasonal reduction of the near surface soil strength will occur. This may cause additional unstable or pumping subgrade areas for constructability concerns.

The actual quantity of the subgrade undercut or stabilization should be determined by ECS at the time of construction.

6.1.6 Site Temporary Dewatering

We anticipate utility excavations will likely extend below the groundwater level encountered in Boring 7. Further, seasonal variations in precipitation and site drainage conditions can cause the accumulation of water in the upper soils, particularly within existing fill and more permeable granular soils underlain by less permeable clayey soils. Where excavations extend less than 2 feet below the groundwater level, initial attempts to control water may be accomplished by pumping from sump pits in the excavation bottom, which are backfilled with AASHTO Size No. 57 Stone or open-graded bedding material. If water control cannot be maintained with sump pumps, or where excavations extend more than 2 feet below the static groundwater level, a more substantial excavation dewatering system, such as a temporary well point system, may be required to control groundwater seepage during construction. ECS recommends the contractor be required to submit a Dewatering Plan as part of the project specifications for water conditions beyond the capability of pumping from sumps.

More complex dewatering techniques, such as vacuum wells or other methods, should be started prior to excavation to prevent "boiling" and/or "heaving" of the subgrade soils. Dewatering should continue until all earthwork operations and backfilling have extended above the water table.

Lowering the static groundwater level can adversely affect nearby structures, utilities and other construction. We recommend any dewatering scheme be reviewed by ECS and a contractor who specializes in this type of work prior to its implementation.

6.1.7 Subgrade Stabilization

Subgrade Benching: Fill should not be placed on ground with a slope steeper than 5H:1V. The ground should be benched so as to allow for fill placement on a horizontal surface.

Subgrade Compaction: Upon completion of subgrade documentation, the exposed subgrade within the 5-foot expanded pavement area and embankment limits should be moisture conditioned to within +/- 3 percent of the soil's optimum moisture content to a depth of 10 inches, and be compacted with suitable equipment (minimum 10-ton vibratory roller for granular soils or a sheepsfoot roller for cohesive soils). The subgrade within the expanded pavement limits should be compacted to a dry density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). Beyond these areas, compaction should be to at least 90 percent. ECS should be called on to document the achievement of proper subgrade compaction.

Subgrade Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits for structures, pavements, fills, and slopes, etc. We recommend performing field density testing of subgrade soils at the frequencies listed in Table 6.1.1 of this report.

Table 6.1.1 Frequency of Subgrade Compaction Testing

Location	Frequency of Tests
Pavement Areas	1 test per 10,000 sq. ft.
Other Non-Critical Areas	1 test per 10,000 sq. ft.

6.2 EARTHWORK OPERATIONS

6.2.1 Engineered Fill Materials

Product Submittals: Prior to placement of engineered fill, representative bulk samples (about 50 pounds) of on-site and off-site borrow should be submitted to ECS for laboratory testing, which will include natural moisture content, grain-size distribution, and moisture-density relationships for compaction. Import materials should be tested prior to being hauled to the site to determine if they meet project specifications.

Satisfactory Engineered Fill Materials: Engineered fills should consist of approved materials, free of organic matter and debris, contain no particle sizes greater than 3 inches in the largest dimension, and have a Liquid Limit and Plasticity Index less than 40 and 15, respectively. Open-graded materials, such as coarser sands and gravels (SP and GP), which contain void space in their mass should not be used in engineered fills unless properly encapsulated within a filter geotextile. If the fill is to provide non-frost susceptible characteristics, it must be classified as a clean GW, GP, SW or SP per Unified Soil Classification System (ASTM D-2487).

Unsatisfactory Materials: Unsatisfactory engineered fill materials, which do not satisfy the requirements for suitable materials, include topsoil and organic materials (PT, OH, OL), silt (ML), sandy silt (ML), elastic Silt (MH), silty clay (CL-ML), sandy silty clay (CL-ML) and high plasticity clay (CH). Topsoil is not recommended to be used as engineered fill, but may be suitable for use within future landscape areas. A landscape architect should approve any materials proposed for use in future landscape areas.

Pea gravel is not recommended to be used as engineered fill. Pea gravel has round/smooth characteristics, no fines and does not interlock when compacted, which makes it more susceptible to future movement and instability resulting in excessive and variable settlement.

On-Site Borrow Suitability: The on-site soil, with the exception of silt (ML), silty clay (CL-ML) and sandy silty clay (CL-ML), may be feasible to use as engineered fill, but should be further evaluated and approved by ECS prior to its use. On-site soil used as engineered fill must not contain an adverse amount of organic matter, and must be free of frozen matter, deleterious materials, over-sized material (maximum 3-inch particle diameter), or chemicals that may result in the material being classified as "contaminated." Depending on the conditions at the time of construction, the use of on-site soil for foundation support may not be practical, and use of an imported high quality granular material may be needed for foundation support. The material used as engineered fill must be considered low volume change material with a maximum Liquid Limit of 40 and maximum Plasticity Index of 15, unless specifically tested and found to have low volume change properties and approved by ECS. The soils must be compacted within a narrow range of the materials optimum moisture content. The soil samples had relatively high moisture contents so the contractor should expect some drying of on-site soil prior to reuse as engineered fill. The soil should not be compacted too dry as it may lose its apparent stability if it later becomes wet. The suitability of engineered fill materials should be checked by ECS prior to placement. Sorting to remove over-sized material (i.e. cobbles) should be expected at this site prior to re-use of the on-site soil as engineered fill.

Natural soil deposits considered unsuitable by virtue of their plasticity are present on the site. The moisture contents of many of the samples were observed to generally be more than 5 percent above the optimum moisture contents of the material. The construction team should anticipate moisture conditioning (mostly drying) of subgrade soils and engineered fill lifts at this site. Soil chemical modification may be helpful to reduce moisture contents of subgrade soils and fills.

6.2.2 Compaction

Engineered Fill Compaction: Engineered fill within the expanded pavement, and embankment limits should be placed in maximum 8-inch thick loose lifts, moisture conditioned as necessary to within +/- 3 percent of the soil's optimum moisture content, and be compacted with suitable equipment to a dry density of at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). Beyond these areas, the engineered fill should be compacted to at least 90 percent. ECS should be called on to document the achievement of proper fill compaction.

Fill Compaction Control: The expanded limits of the proposed construction areas should be well defined, including the limits of the fill zones for pavements and embankment slopes, etc., at the time of fill placement. Grade controls should be maintained throughout the filling operations. All filling operations should be observed on a full-time basis by a qualified representative of ECS to

document the achievement of the minimum compaction requirements. Field density testing of fills should be performed at the frequencies shown in Table 6.2.1, but not less than 2 tests per lift.

Table 6.2.1 Frequency of Compaction Tests in Fill Areas

Location	Frequency of Tests
Pavement Areas	1 test per 10,000 sq. ft. per lift
Utility Trenches	1 test per 200 linear ft. per lift
All Other Non-Critical Areas	1 test per 10,000 sq. ft. per lift

Compaction Equipment: Compaction equipment suitable to the soil type being compacted should be used to compact the subgrades and fill materials. Sheepsfoot compaction equipment should be suitable for the fine-grained soils (Clays). A vibratory steel drum roller or plate compactor should be used for compaction of coarse-grained soils (Sands and Gravels) as well as for sealing compacted surfaces.

Fill Placement Considerations: Fill materials should not be placed on frozen soils, on frost-heaved soils, and/or on excessively wet soils. Borrow fill materials should not contain frozen materials at the time of placement, and all frozen or frost-heaved soils should be removed prior to placement of engineered fill or other fill soils and aggregates. Scarify, aerate and moisture condition excessively wet soils or aggregates.

At the end of each work day, all fill areas should be graded to facilitate drainage of any precipitation and the surface should be sealed by use of a smooth-drum roller to limit infiltration of surface water. During placement and compaction of new fill at the beginning of each workday, the contractor may need to scarify existing subgrades to a depth of 4 inches or more so that a weak plane will not be formed between the new fill and the existing subgrade soils.

Drying and compaction of wet soils is typically difficult during the cold, winter months. Accordingly, earthwork should be performed during the warmer, drier times of the year, if practical. Proper drainage should be maintained during the earthwork phases of construction to reduce ponding of water which has a tendency to degrade subgrade soils. Alternatively, if these soils cannot be stabilized by conventional methods as previously discussed, chemical modifications of the subgrade soils, such as with lime, cement or other materials, may be utilized to adjust the moisture content. If lime or cement is utilized to control moisture contents and/or for stabilization, then ECS recommends the use of Quick Lime, Calciment® or regular Type 1 cement. The soil modification procedure, such as determination of the quantity of additive, and mixing and curing procedures, should be evaluated before implementation. The contractor should be required to minimize dusting or implement dust control measures.

Where fill materials will be placed to widen existing embankment fills, or placed up against sloping ground, the soil subgrade should be scarified, and the new fill benched and keyed into the existing material. Fill material should be placed in horizontal lifts. In confined areas such as utility trenches, portable compaction equipment and thin lifts of 3 inches to 4 inches may be required to achieve specified degrees of compaction.

We recommend the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. We do not anticipate significant problems in controlling moisture during dry

weather, but moisture control may be difficult during winter months or extended periods of rain. The control of moisture content of clay soils can be difficult when these soils become wet. Further, construction traffic can easily degrade soils that have an elevated moisture content.

6.3 PAVEMENT SUBGRADE OBSERVATIONS

Pavement Subgrade Verification: ECS should be called on to observe and test exposed subgrade within the expanded pavement limits prior to engineered fill placement and pavement construction to check achievement of adequate subgrade preparation. A proofroll using a loaded dump truck should be performed in their presence at that time. Once subgrades have been prepared to the satisfaction of ECS, subgrades should be properly compacted and new engineered fill can be placed. Existing subgrades to a depth of at least 10 inches and all engineered fill should be properly moisture conditioned and compacted to the required in-place density. ECS should check the condition of the prepared subgrade prior to placement of the subbase stone and pavement. If there will be significant time lag between the subgrade check and placement of the subbase stone and pavement, ECS may need to recheck the condition of the subgrade before placement of stone and pavement. Prior to final pavement construction, the subgrade may require scarification, moisture conditioning, and re-compaction to restore stable conditions.

6.4 UTILITY INSTALLATIONS

Utility Subgrades: The native soils encountered in our exploration are expected to be generally suitable for support of utility pipes. However, we recommend removing all existing fill and soils that contain more than 5 percent organic content from below utilities. The pipe subgrade should be observed and probed for stability by ECS to evaluate the suitability of the encountered materials. Any loose or unsuitable materials encountered at the utility pipe subgrade elevation should be removed and replaced with suitable compacted engineered fill or pipe bedding material.

Utility Backfilling: The granular bedding material should be at least 4 inches thick, but not less than that specified by the project drawings and specifications. Fill placed for support of the utilities, as well as backfill over the utilities, should satisfy the requirements for engineered fill given in this report. Compacted backfill should be free of topsoil, roots, ice, or any other material designated by ECS as unsuitable. The backfill should be moisture conditioned, placed, and compacted in accordance with the recommendations of this report.

6.5 GENERAL CONSTRUCTION CONSIDERATIONS

Moisture Conditioning: During the cooler and wetter periods of the year, the construction team should anticipate delays and additional costs. At these times, reduction of soil moisture may need to be accomplished by mechanical manipulation to lower moisture contents to levels appropriate for compaction. Alternatively, during the drier times of the year, such as the summer months, moisture may need to be added to the soil to provide adequate moisture for successful compaction according to the project requirements.

Subgrade Protection: Measures should be taken to limit site disturbance, especially from rubber-tired heavy construction equipment, and to control and remove surface water from development areas, including pavement areas. ECS recommends the design team consider designating a haul road and construction staging area to limit the areas of disturbance and to prevent construction

traffic from excessively degrading sensitive subgrade soils and existing pavement areas. Haul roads and construction staging areas could be covered with excess depths of aggregate to protect those subgrades. The aggregate can later be removed and used in pavement areas provided it has not been mixed with silty or clayey soils.

Surface Drainage: The contractor should properly maintain surface drainage conditions. Surface water should be directed away from the construction area, and the work area should be sloped away from the construction area at a gradient of 1 percent or steeper to reduce the potential of ponding water and the subsequent saturation of the surface soils. At the end of each work day, the subgrade soils should be sealed by rolling the surface with a smooth drum roller to reduce infiltration of surface water.

Excavation Safety: The contractor should make and maintain all excavations and slopes in accordance with OSHA excavation safety standards. The contractor is solely responsible for designing and constructing stable, excavations and slopes and should shore, slope, or bench the sides of the excavations and slopes as required to maintain stability of both the excavation sides and bottom. The contractor's responsible person, as defined in OSHA 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. ECS is providing this information solely as a service to our client. ECS is not assuming responsibility for construction site safety or the contractor's activities; ECS does not imply such responsibility, and the contractor, design team and owner should not infer it.

Excavation Instability: Excavation stability and caving problems may occur due to the existing fill soils. The instability problems will generally depend upon the excavation depth, length of time the excavations remain open, inclination of excavation side-walls, magnitude and location of surcharges near the excavations, groundwater levels and the suitability of any dewatering systems if needed.

Excavation Difficulties: Excavation difficulties for utilities and other construction may occur due to the presence of existing utilities. The degree of excavation difficulty will generally depend upon the depth of excavation and capabilities of the excavation equipment.

Existing Construction Considerations: Site preparation will require complete removal and proper disposal of the existing pavement to be removed and any remnants of previous construction, including all underground utilities that are not reused, etc. Disposal of debris should be in accordance with local, state and federal regulations for the material type. It should be noted that any construction remnants left in-place may cause excavation difficulties for new utilities and/or landscape plantings. All excavations must be backfilled with compacted engineered fill performed under engineering controlled conditions.

Removal of the existing pavement and placement of engineered backfill is recommended to be observed and tested by ECS. Alteration to the recommendations of this report may be needed, if conditions different than those noted on the boring logs are revealed below the existing construction.

Existing Fill Considerations: Existing fill was encountered in a majority of the test boring locations. Unsuitable materials may have been buried beneath the site surface during previous site grading or construction not detected by the test borings. Questionable material, if encountered, is recommended to be evaluated by ECS to determine if the material needs to be removed and replaced with engineered fill. Alteration to the recommendations of this report may be needed, if excavations reveal conditions different than those noted on the test boring logs.

Erosion Control: The surface soils may be erodible. Therefore, the Contractor should provide and maintain good site drainage during earthwork operations to maintain the integrity of the surface soils. All erosion and sedimentation controls should be in accordance with sound engineering practices and local requirements.

Bidding/Estimating Considerations: Contractors bidding or undertaking any work at the site should examine the results of the subsurface exploration, satisfy themselves as to the adequacy of the information for bidding and construction, make their own interpretation of the data, and consider the effect it may have on their cost proposal, construction techniques, schedule, and equipment capabilities. Furthermore, contractors should complete any additional fieldwork and investigation they deem necessary to properly prepare a cost proposal for the site work. Soil borings do not provide the same wide-scale view of the subsurface conditions that is obtained during site grading, excavation or other aspects of earthwork construction. Additional scope may be required to obtain more detailed subsurface information needed for earthwork bid preparation, which could include test pits to better understand the lateral and vertical extents of the subsurface materials of concern such as existing undocumented fill. Even with this additional information, budget contingencies should be carried in construction to help cover potential variations in subsurface conditions.

7.0 CLOSING

ECS has prepared this report of findings, evaluations, and recommendations to guide geotechnical-related design and construction aspects of the project.

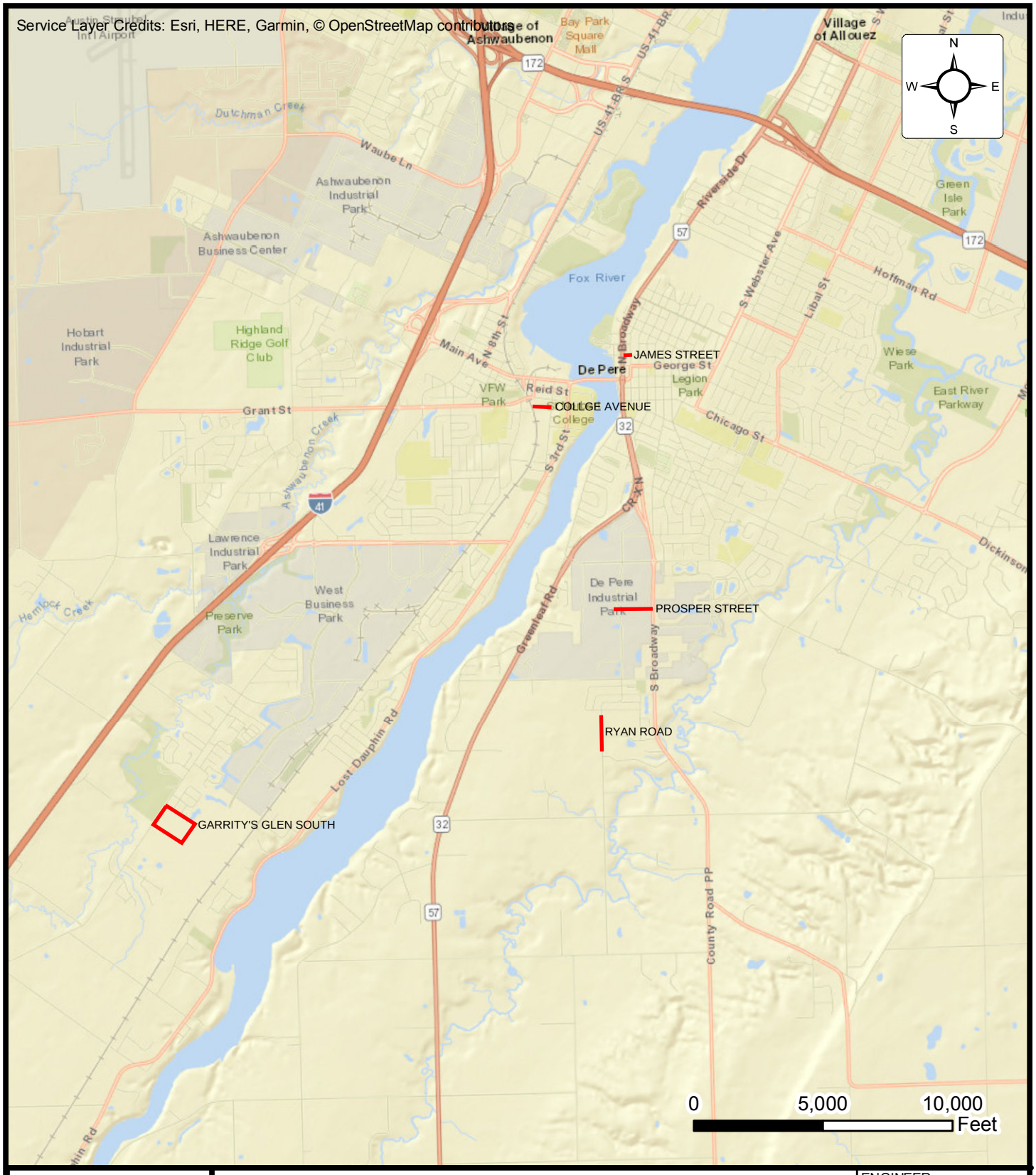
The description of the proposed project is based on information provided to ECS by the City of De Pere. If any of this information is inaccurate, either due to our interpretation of the documents provided or site or design changes that may occur later, ECS should be contacted immediately so that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed construction.

We recommend that ECS be allowed to review the project's plans and specifications pertaining to our work so that we may ascertain consistency of those plans/specifications with the intent of this geotechnical report.

Field observations, and quality assurance testing during earthwork, utility and pavement installation are an extension of and integral to the geotechnical design recommendation. We recommend the owner retain these quality assurance services and that ECS be allowed to continue our involvement throughout these critical phases of construction to provide general consultation as issues arise. ECS is not responsible for the conclusions, opinions, or recommendations of others based on the data in this report.

APPENDIX A – Drawings & Reports

Site Location Diagram
Boring Location Diagram



Site Location Diagram
2019 CONSTRUCTION DESIGN

VARIOUS STREETS, DE PERE, WI

CITY OF DE PERE

ENGINEER	MEK
SCALE	1 " = 5280'
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	11/21/2018

Boring Location Diagram
2019 CONSTRUCTION DESIGN

GARRITY'S GLEN SOUTH, DE PERE, WI

CITY OF DE PERE

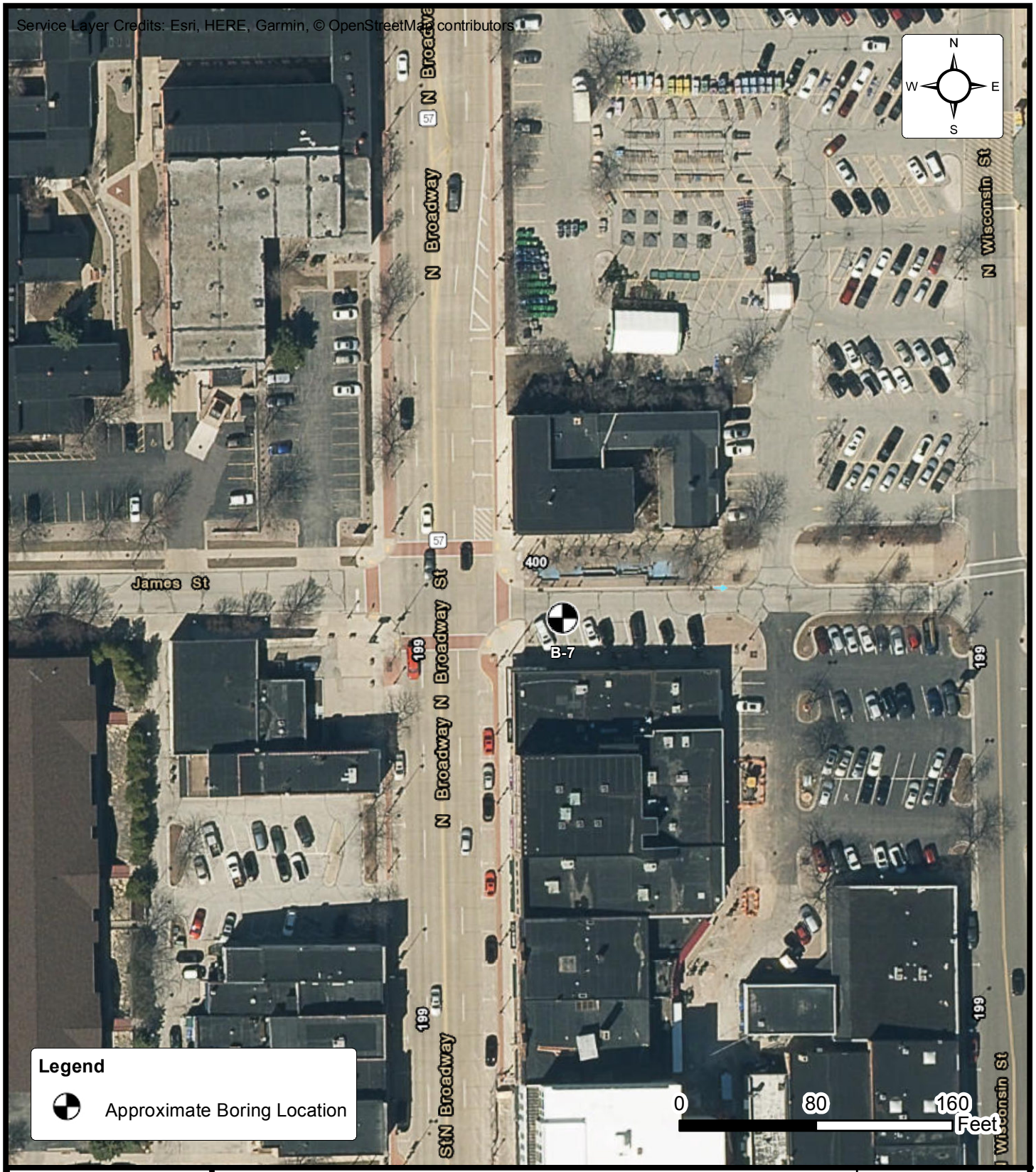
ENGINEER	MEK
SCALE	1 " = 250 '
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	12/17/2018

Boring Location Diagram
2019 CONSTRUCTION DESIGN

COLLEGE AVENUE, DE PERE, WI

CITY OF DE PERE

ENGINEER	MEK
SCALE	1 " = 80 '
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	12/17/2018



Boring Location Diagram
2019 CONSTRUCTION DESIGN

JAMES STREET, DE PERE, WI

CITY OF DE PERE

ENGINEER	MEK
SCALE	1 " = 80 '
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	12/17/2018

Boring Location Diagram
2019 CONSTRUCTION DESIGN

PROSPER STREET, DE PERE, WI

CITY OF DE PERE

ENGINEER	MEK
SCALE	1 " = 250 '
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	12/17/2018

Boring Location Diagram
2019 CONSTRUCTION DESIGN

RYAN ROAD, DE PERE, WI

CITY OF DE PERE

ENGINEER	MEK
SCALE	1 " = 250 '
PROJECT NO.	59:1549
SHEET	1 OF 1
DATE	12/17/2018

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Test Boring Log 1 through 11
Soil and Site Evaluation – Storm

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	SHALE
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
	GW **WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
	GP **POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
	GM **SILTY GRAVEL** gravel-sand-silt mixtures
	GC **CLAYEY GRAVEL** gravel-sand-clay mixtures
	SW **WELL-GRADED SAND** gravelly sand, little or no fines
	SP **POORLY-GRADED SAND** gravelly sand, little or no fines
	SM **SILTY SAND** sand-silt mixtures
	SC **CLAYEY SAND** sand-clay mixtures
	ML **SILT** non-plastic to medium plasticity
	MH **ELASTIC SILT** high plasticity
	CL **LEAN CLAY** low to medium plasticity
	CH **FAT CLAY** high plasticity
	OL **ORGANIC SILT or CLAY** non-plastic to low plasticity
	OH **ORGANIC SILT or CLAY** high plasticity
	PT **PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Medium Stiff
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15 - 25
Adjective *(ex: "Silty")*	≥25	≥30

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] *Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.*

[2] *To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.*

[3] *Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] *Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).*

[5] *Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).*

[6] *The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.*

[7] *Minor deviation from ASTM D 2488-09 Note 16.*

[8] *Percentages are estimated to the nearest 5% per ASTM D 2488-09.*

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CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	1	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Garrity's Glen South

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2

1 2 3 4 5+

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.%

20% 40% 60% 80% 100%

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT

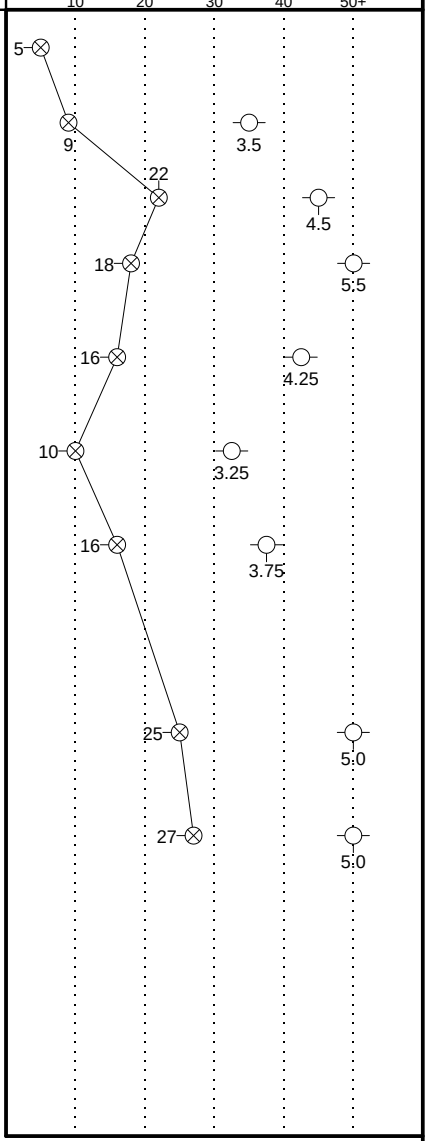
10 20 30 40 50+

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0	S-1	SS	24	4	Topsoil Thickness [6"] (CL) {A-6} Lacustrine, LEAN CLAY WITH SAND AND SEAMS OF SILT, brown, moist, medium stiff to stiff			1 2 3
	S-2	SS	24	9				2 3 4
5	S-3	SS	24	15	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, very stiff to stiff to very stiff			5 5 5
	S-4	SS	18	10				9 13 17
								5 8 10
	S-5	SS	18	11				5 6 10
10	S-6	SS	18	6				10 4 6
	S-7	SS	18	15				4 6 10
15								
	S-8	SS	18	12	(CL/ML) {A-4} Lacustrine, SILTY CLAY, very dark brown, moist, very stiff			9 11 14
20	S-9	SS	24	17				9 13 14 21
					END OF BORING @ 23'			
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/26/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/26/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 23' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	2	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Garrity's Glen South

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

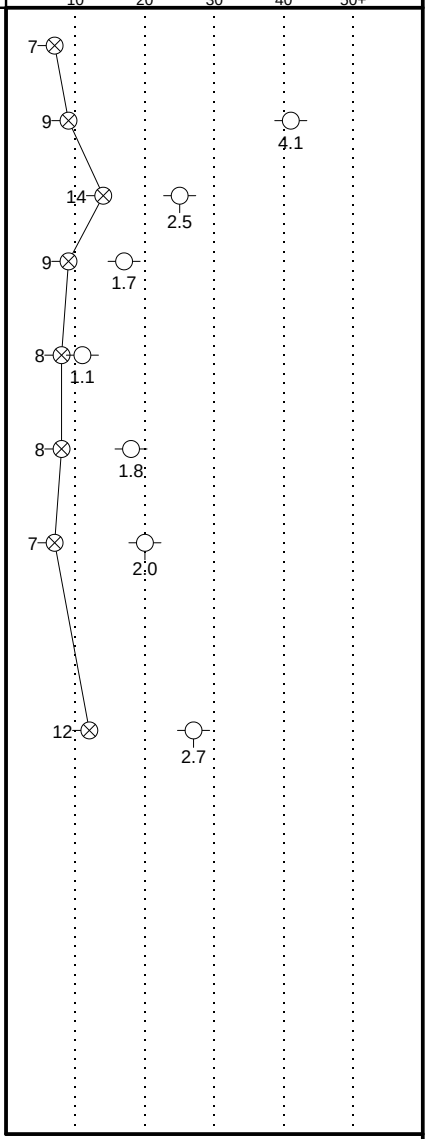
STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

ENGLISH UNITS

BOTTOM OF CASING ▶ LOSS OF CIRCULATION (XX%)

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [8"]			2
	S-1	SS	24	10	(CL) {A-6} FILL, LEAN CLAY WITH SAND AND SILT, dark brown, moist, medium stiff			3 4 4
	S-2	SS	24	10	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, stiff			3 4 5
5	S-3	SS	24	18				5 4 5
	S-4	SS	18	17	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, dark brown, moist, medium stiff to stiff			9 10 3
								4 5
	S-5	SS	18	12				3 4 4
10								
	S-6	SS	18	17				2 3 5
	S-7	SS	18	18				3 3 4
15								
	S-8	SS	18	15				3 5 7
20					END OF BORING @ 20'			
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/26/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/26/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 20' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	3	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Garrity's Glen South

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2

1 2 3 4 5+

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——

20% 40% 60% 80% 100%

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT

10 20 30 40 50+

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT
0								
	S-1	SS	24	4			2 2 2	4
							2 4 3	7
	S-2	SS	24	10			3 4 6	3.3
5	S-3	SS	24	15			3 4 6	10
							7 3 5	4.5
	S-4	SS	18	16			8	13
								3.7
	S-5	SS	18	0			3 4 7	11
10								
	S-6	SS	18	18			3 4 6	10
								3.0
	S-7	SS	18	15			3 6 7	13
15								1.9
	S-8	SS	18	16			4 5 6	11
								2.2
	S-9	SS	18	12			4 6 7	13
20								3.5
25								
30								

Topsoil Thickness [8"]

(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, soft to medium stiff

(CH) {A-7-6} Lacustrine, FAT CLAY WITH SAND, brown, moist, stiff

END OF BORING @ 20'

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/26/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/26/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 20' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	4	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Garrity's Glen South

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

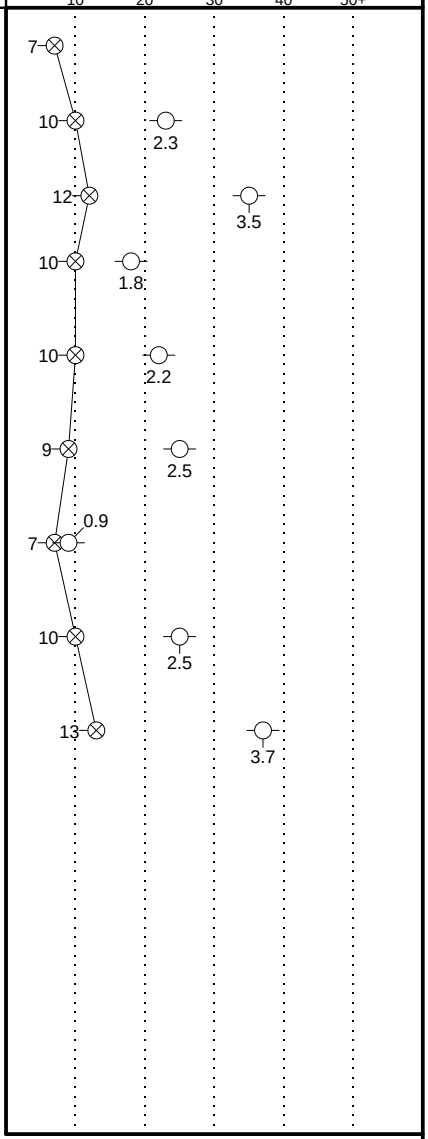
STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION: Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Topsoil Thickness [8"]			
	S-1	SS	24	12	(CL) {A-6} FILL, LEAN CLAY WITH SAND, brown, moist, medium stiff			2 3 4
	S-2	SS	24	5				4 3 4
5	S-3	SS	24	17	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist to wet, stiff to medium stiff to stiff			6 8 3
	S-4	SS	18	18				4 8 10
	S-5	SS	18	5				3 4 6
10	S-6	SS	18	18				3 4 6
	S-7	SS	18	18				3 4 5
15	S-8	SS	18	15				2 3 4
	S-9	SS	18	10				3 4 6
20					END OF BORING @ 20'			4 6 7
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/26/18	
WL(BCR) WL(ACR) 18 feet	BORING COMPLETED 11/26/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 20' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	5	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

College Avenue

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

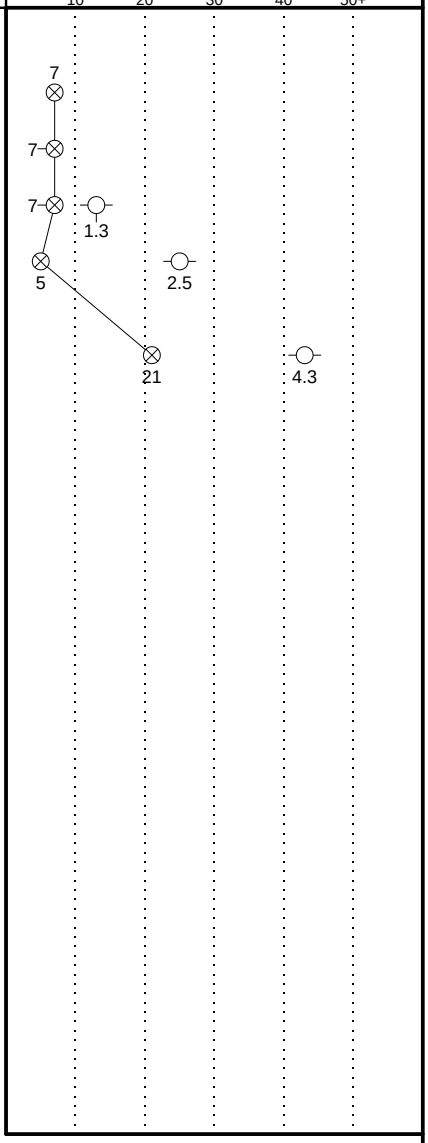
STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt Thickness [3.5"] Gravel Thickness [14"]			
	S-1	SS	18	6	(CL/ML) {A-4} FILL, SANDY SILTY CLAY WITH ORGANICS, very dark brown, moist, medium stiff			1 3 4
	S-2	SS	18	6				3 3 4
5	S-3	SS	18	9	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, medium stiff to very stiff			2 3 4
	S-4	SS	18	12				2 2 3
	S-5	SS	18	13				6 9 12
10					END OF BORING @ 10'			
15								
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 10' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	6	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

College Avenue

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

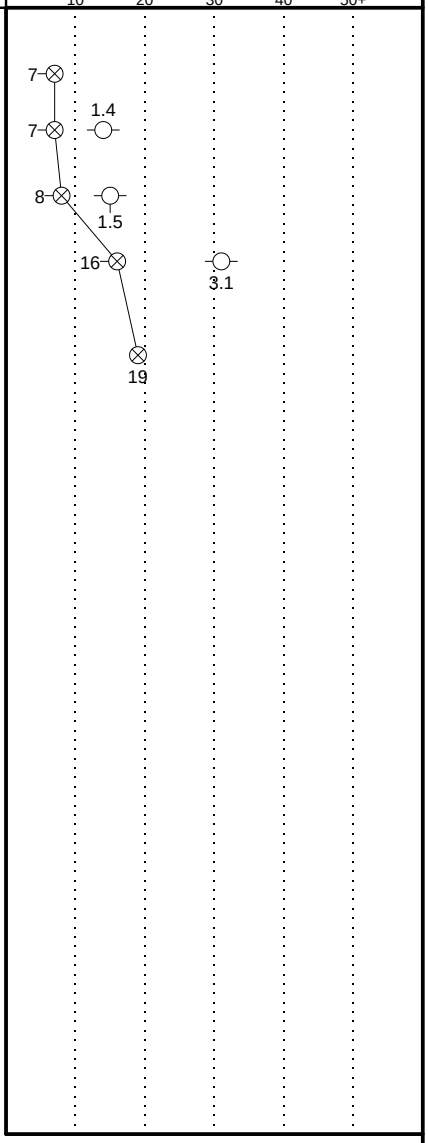
STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt Thickness [4"]			
					Gravel Thickness [3"]			
	S-1	SS	18	8	(CL/ML) {A-4} FILL, SILTY CLAY WITH SAND, trace Organics, very dark brown, moist, medium stiff			2 3 4
	S-2	SS	18	3	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND AND SEAMS OF SILT, trace gravel, brown with gray, moist, medium stiff to very stiff			2 3 4
5	S-3	SS	24	12				3 3 5 6
	S-4	SS	18	15				5 7 9
	S-5	SS	18	7				7 9 10
10					END OF BORING @ 10'			
15								
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 10' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	7	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

James Street

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2

1 2 3 4 5+

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——

20% 40% 60% 80% 100%

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT

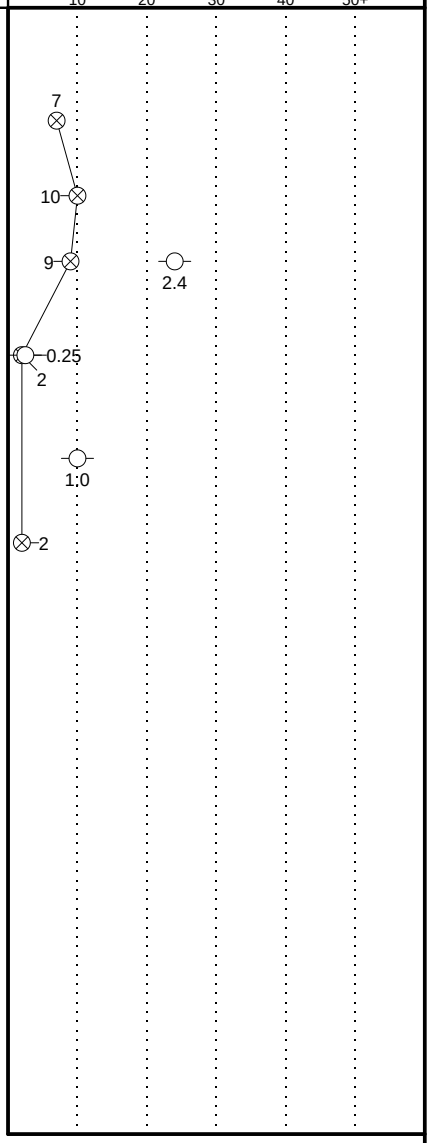
10 20 30 40 50+

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt Thickness [6"]			
					Pulverized Asphalt Thickness [5.5"]			
					Gravel Thickness [11.5"]			
	S-1	SS	24	12	(CL) {A-6} FILL, LEAN CLAY WITH POCKETS OF SAND, brown, moist, medium stiff to stiff			3 4 3
5	S-2	SS	24	15				5 5 5
	S-3	SS	18	12	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist to wet, stiff			5 5 5 3 4 5
	S-4	SS	18	18	(CH) {A-7-6} Lacustrine, FAT CLAY, brown, wet, very soft	▽		1 1 1
10	S-5	ST	24	27				
	S-6	SS	18	0				1 1 1
15					END OF BORING @ 15'			
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

▽ WL 8 feet WS ☐ WD ☒	BORING STARTED 11/27/18	
▽ WL(BCR) ▼ WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
▽ WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 15' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	8	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Prosper Street

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

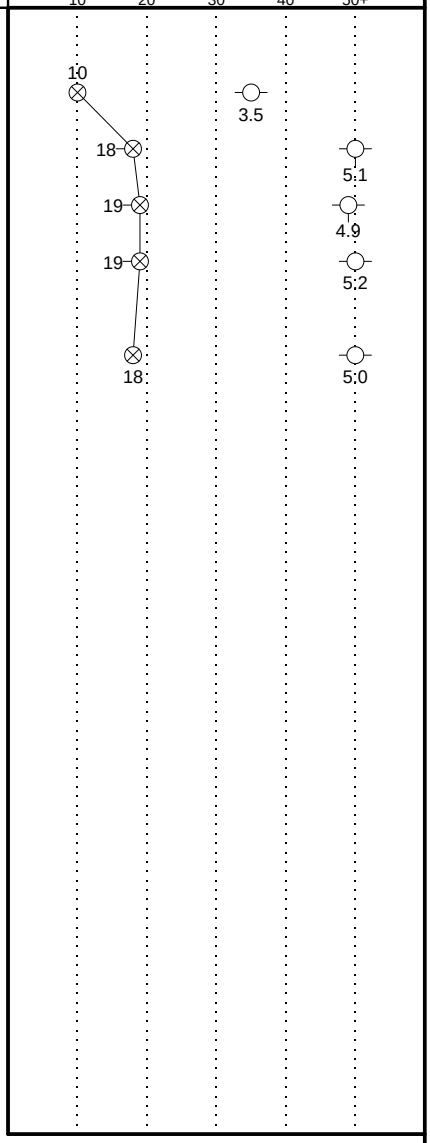
STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▶ LOSS OF CIRCULATION (100%)

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Concrete Thickness [6"]			
					Gravel Thickness [9"]			
	S-1	SS	18	9	(CL) {A-6} FILL, LEAN CLAY WITH SAND, dark brown, moist, stiff			4 5 5
	S-2	SS	18	6	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, stiff to very stiff			4 9 9
5	S-3	SS	18	13				5 8 11
	S-4	SS	18	6				5 8 11
	S-5	SS	18	15				6 7 11
10					END OF BORING @ 10'			
15								
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 10' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	9	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Prosper Street

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2

1 2 3 4 5+

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——

20% 40% 60% 80% 100%

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT

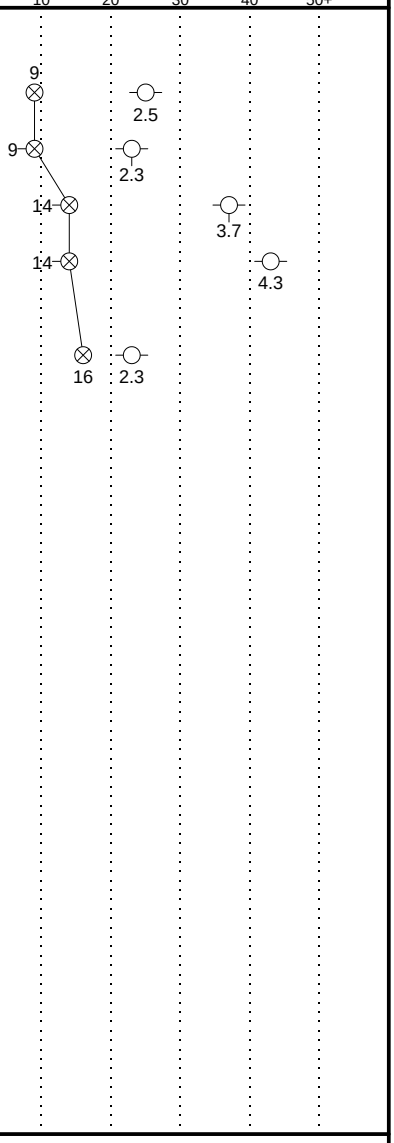
10 20 30 40 50+

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING ▰ LOSS OF CIRCULATION ⟩⟨

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Concrete Thickness [8"]			
					Gravel Thickness [10"]			
	S-1	SS	18	6	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND AND GRAVEL, brown, moist, stiff			3 4 5
	S-2	SS	18	5				4 4 5
5	S-3	SS	18	9	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, dark brown, moist, stiff to very stiff			4 5 9
	S-4	SS	18	15				4 6 8
	S-5	SS	18	3				4 7 9
10					END OF BORING @ 10'			
15								
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 10' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	10	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Ryan Road

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2

1 2 3 4 5+

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.%

20% 40% 60% 80% 100%

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT

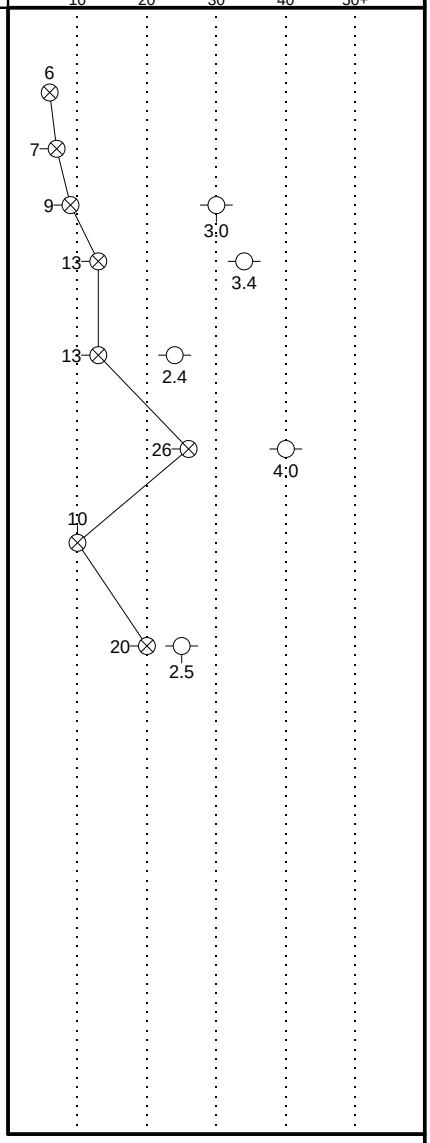
10 20 30 40 50+

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
0					Asphalt Thickness [1"]			
					Gravel Thickness [14"]			
	S-1	SS	18	8	(CL) {A-6} FILL, LEAN CLAY WITH SAND AND GRAVEL, dark brown, moist, medium stiff			5 2 4
	S-2	SS	18	5				2 3 4
5	S-3	SS	18	5	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, trace gravel, brown, moist, stiff to very stiff			3 4 5
	S-4	SS	18	5				4 5 8
	S-5	SS	18	5				4 5 8
10								
	S-6	SS	18	15				6 11 15
	S-7	SS	18	2				3 4 6
15								
	S-8	SS	24	18				6 8 12 13
					END OF BORING @ 18'			
20								
25								
30								



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 18' (AH)

CLIENT	JOB #	BORING #	SHEET
City of De Pere	1549	11	1 OF 1

PROJECT NAME	ARCHITECT-ENGINEER
2019 Construction Design	

SITE LOCATION

Various Streets, De Pere, Brown County, Wisconsin

Additional info.

Ryan Road

Station+Offset

CALIBRATED PENETROMETER TONS/FT^2 (1, 2, 3, 4, 5+)

ROCK QUALITY DESIGNATION & RECOVERY

RQD% — — REC.% ——— (20%, 40%, 60%, 80%, 100%)

PLASTIC LIMIT — WATER CONTENT % — LIQUID LIMIT %

STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50+)

DESCRIPTION OF MATERIAL — ENGLISH UNITS

BOTTOM OF CASING — LOSS OF CIRCULATION

SURFACE ELEVATION Not Indicated

DEPTH (FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"	STANDARD PENETRATION BLOWS/FT	POCKET PEN. TONS/FT^2
0					Asphalt Thickness [2.5"] Gravel Thickness [14"]					
	S-1	SS	18	4	(CL) {A-6} Lacustrine, LEAN CLAY WITH SAND, brown, moist, medium stiff to very stiff			4 4 4	8	2.2
	S-2	SS	18	4	NOTE: 2 inch layer of Silt encountered beneath Gravel Base Course.			4 4 5	9	2.3
5	S-3	SS	18	9				3 4 6	10	3.2
	S-4	SS	18	15				4 4 6	10	2.2
	S-5	SS	18	15				3 4 6	10	3.0
10	S-6	SS	18	12				5 9 11	20	3.8
	S-7	SS	18	9				3 4 7	11	3.2
15	S-8	SS	24	18				6 10 12 14	22	5.3
					END OF BORING @ 17'					
20										
25										
30										

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL.

WL None WS ☐ WD ☒	BORING STARTED 11/27/18	
WL(BCR) WL(ACR) None	BORING COMPLETED 11/27/18	CAVE IN DEPTH
WL	RIG ATV FOREMAN GB/BB	DRILLING METHOD 3 1/4" HSA 0' to 17' (AH)

1002-CPS-1
Division of Industry Services
P. O. Box 2658
Madison, Wisconsin 53701
Scott Walker, Governor
Laura Gutierrez, Secretary

SOIL AND SITE EVALUATION – STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road

Please print all information

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]

County: Brown

Parcel I.D.: WD-L484

Reviewed by: M King / M Meyer
Date: 12/3/18

Property Owner: R&M Garrity Farm, LLC ETAL

Property Location: Govt. Lot SW¼ SW¼ S6 T22 N R20 E

Property Owner' Mail Address: 3173 Trenton Lane

Lot # | Block # | Subd. Name or CSM #: Garrity's Glen South

City: Green Bay | State: WI | Zip Code: 54313-4025 | Phone Number

☒ City ☐ Village ☐ Town — De Pere

Nearest Road: Adare Court

Drainage area _____ ☐ sq .ft ☐ acres

Test site suitable for (check all that apply): ☐ Site not suitable;

☐ Bioretention; ☐ Subsurface Dispersal System;

☐ Reuse; ☐ Irrigation; ☐ Other _____

Hydraulic Application Test Method

☒ Morphological Evaluation

☐ Double Ring Infiltrometer

☐ Other: (specify) _____

Soil Moisture
Date of soil borings: _____

USDA-NRCS WETS Value:
☐ Dry =1;
☒ Normal = 2;
☐ Wet = 3.

3 #OBS. ☐ Pit ☒ Boring Ground surface elevation. ---ft. Elevation of limiting factor ---ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
A	0 – 8	7.5 YR 4/3	No Redox Features	c	0, cdy	fr	C	0 – 5	60 – 70	0.07
C	8 – 60	7.5 YR 4/4	No Redox Features	c	1, f, abk	fi	C	0 – 5	70 – 80	0.07
C	60 – 240	7.5 YR 4/3	No Redox Features	c	1, f, abk	fi	---	0 – 5	70 – 80	0.07

Comments:

4 #OBS. ☐ Pit ☒ Boring Ground surface elevation. ---ft. Elevation of limiting factor 216 ft.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate Inches/Hr
---	0 – 8	7.5 YR 3/2	No Redox Features	c	0, cdy	fr	C	0 – 5	60 – 70	0.07
---	8 – 36	7.5 YR 4/4	No Redox Features	c	0, cdy	fr	C	0 – 5	70 – 80	0.07
C	36 – 240	7.5 YR 4/3	No Redox Features	c	1, f, abk	fi	---	0 – 5	70 – 80	0.07

Comments:

Name (Please Print): Matthew A. Meyer

Signature: Matthew A. Meyer

Credential Number: 1053414

Address: 1060 Breezewood Lane, Suite 102 Neenah, WI 54956

Date Evaluation Conducted: 12/3/18

Telephone Number: 920-886-1406

SBD-10793 (R01/17)

WDNR
September 2017

APPENDIX C – Supplemental Report Documents

Important Information about This Geotechnical-Engineering Report

Important Information about Your

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical-Engineering Report Is Based on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical-engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical-engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold-prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your GBA-Member Geotechncial Engineer for Additional Assistance

Membership in the GEOPROFESSIONAL BUSINESS ASSOCIATION exposes geotechnical engineers to a wide array of risk confrontaton techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBA-member geotechnical engineer for more information.

GEOPROFESSIONAL BUSINESS ASSOCIATION

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

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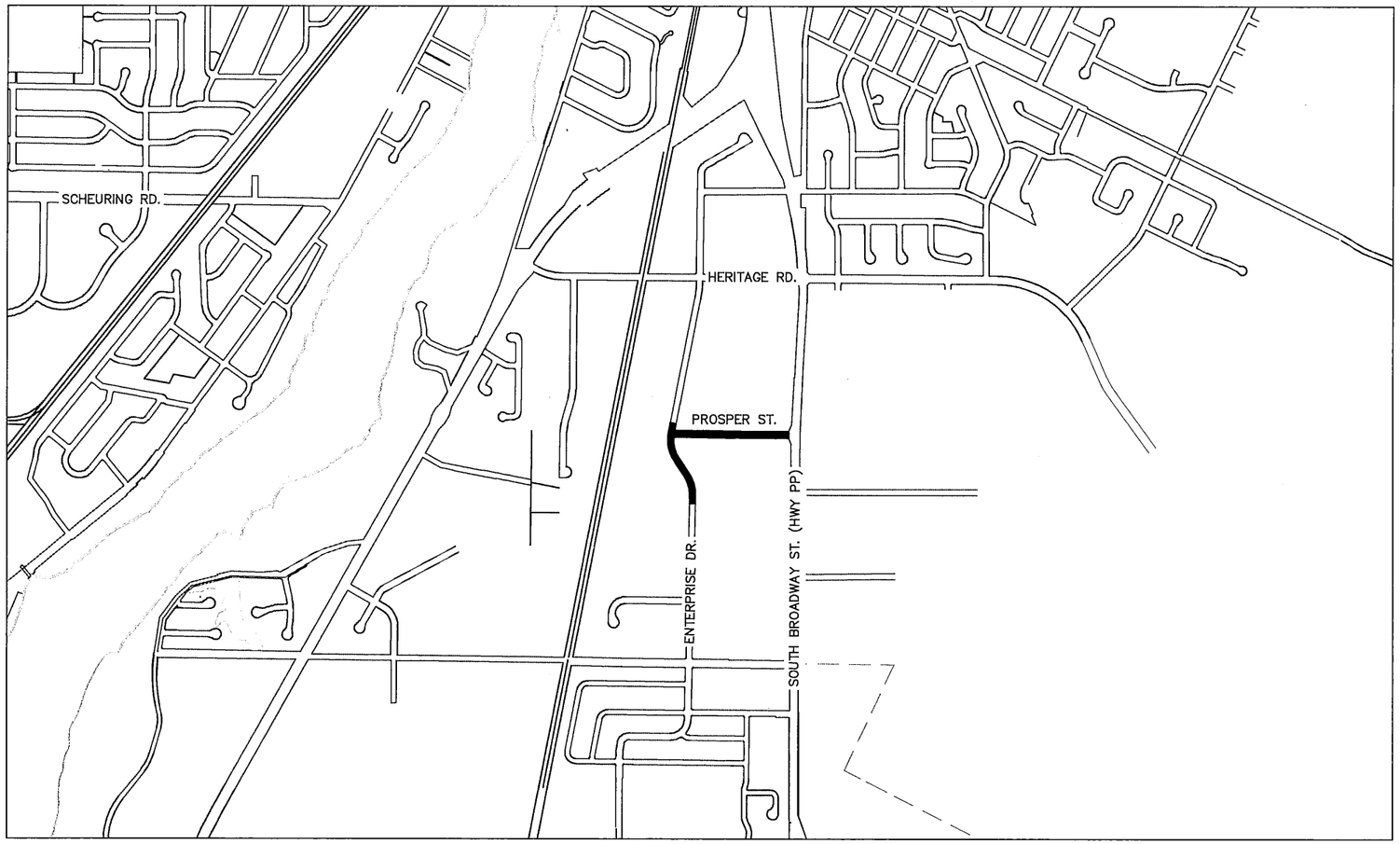
PROJECT# 19-18
PROSPER STREET & ENTERPRISE DRIVE
RECONSTRUCTION AND UTILITY RELAY

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
G003–G004	TYPICAL SECTIONS
G005	BENCHMARKS AND CONTROL POINTS
C101 – C102	ENTERPRISE DRIVE PLAN AND PROFILE SHEETS
C103 – C105	PROSPER STREET PLAN AND PROFILE SHEETS
C301 – C307	PROSPER STREET CROSS SECTIONS
C308 – C311	ENTERPRISE DRIVE CROSS SECTIONS
C401	INTERSECTION DETAILS
C402	EROSION CONTROL PLAN
C403 – C404	DRIVEWAY DETAILS
C405	TRAFFIC CONTROL PLANS
C406	STAGING PLAN
C501 – C517	CONSTRUCTION DETAILS
E101 – E105	STREET LIGHTING PLAN

CITY OF DE PERE
BOARD OF PUBLIC WORKS

3/14/19 DATE	E. P. Rakers CITY ENGINEER
3/14/19 DATE	CITY ADMINISTRATOR
3/14/19 DATE	Michael J. Walsh MAYOR

STAMPS:

WISCONSIN
ERIC P. RAKERS
E-30929
GREEN BAY, WI
PROFESSIONAL ENGINEER
3/14/19

LIST OF STANDARD ABBREVIATIONS

ADT	AVERAGE DAILY TRAFFIC
AGGR	AGGREGATE
AH	AHEAD
ASPH	ASPHALT
B/B	BACK TO BACK
BARR	BARRICADE
BC	BACK OF CURB
BK	BACK
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BOW	BACK OF SIDEWALK
BSMT	BASEMENT
C	CUT
C&G	CURB AND GUTTER
C/C	CENTER TO CENTER
CABC	CRUSHED AGGREGATE BASE COURSE
CB	CATCH BASIN
CE	CONSTRUCTION ENTRANCE
CI	CAST IRON PIPE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CNTY	COUNTY
CO	CLEANOUT
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONSTR JT	CONSTRUCTION JOINT
CP	CONTROL POINT
CTH	COUNTY TRUNK HIGHWAY
CTRL JT	CONTROL JOINT
CTV	CABLE TV
CY	CUBIC YARD
D	DEPTH
DIA	DIAMETER
DI	DUCTILE IRON PIPE
DISCH	DISCHARGE
DW	DRIVEWAY
E	EAST (SEE ELEC BELOW)
EA	EACH
EB	EASTBOUND
EBS	EXCAVATION BELOW SUBGRADE
ECS	EXTERNAL CHIMNEY SEAL
EL	ELEVATION
ELEC	ELECTRIC (E WHEN USED IN LINE STYLE)
EMB	EMBANKMENT
ENTR	ENTRANCE
EP	EDGE OF PAVEMENT
EW	ENDWALL
EXC	EXCAVATION
EXIST	EXISTING
F	FILL
F/F	FACE TO FACE
FDN	FOUNDATION
FE	FIELD ENTRANCE
FERT	FERTILIZER
FIN GR	FINISHED GRADE
FL	FLOWLINE
FO	FIBER OPTIC
FOW	FRONT OF SIDEWALK
FT	FOOT
FTG	FOOTING
G	GAS
GV	GAS VALVE
GW	GUY WIRE
HDPE	HIGH DENSITY POLYETHYLENE
HR	HANDICAP RAMP
HSE	HOUSE
HT	HEIGHT
HYD	HYDRANT
I	INTERSECTION ANGLE
ICS	INTERNAL CHIMNEY SEAL
ID	INSIDE DIAMETER
IN	INCH
INL	INLET
INTERS	INTERSECTION
INV	INVERT
IP	IRON PIPE OR PIN
JCT	JUNCTION
L	LENGTH (OF CURVE)
LC	LONG CHORD OF CURVE
LP	LIGHTPOLE
LS	LIFT STATION OR LUMP SUM
LT	LEFT
MAINT	MAINTENANCE
MATL	MATERIAL
MB	MAILBOX
MH	MANHOLE
MP	MARKER POST
N	NORTH
NB	NORTHBOUND
NC	NORMAL CROWN
NE	NORTHEAST
NO	NUMBER
NTS	NOT TO SCALE
NW	NORTHWEST
O	OIL
O&C	OIL AND CHIP
OBLIT	OBLITERATE
OD	OUTSIDE DIAMETER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PCC	PORTLAND CEMENT CONCRETE
PED	PEDESTAL
PLE	PERMANENT LIMITED EASEMENT
PVMT	PAVEMENT
PE	PRIVATE ENTRANCE
PI	POINT OF INTERSECTION
PJF	PRE-FORMED JOINT FILLER
PL	PROPERTY LINE
POC	POINT OF CURVE
POT	POINT ON TANGENT
PP	POLYETHYLENE
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSI	POUND PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
R	RANGE OR RADIUS
RCP	REINFORCED CONCRETE PIPE
REBAR	REINFORCEMENT BAR
REL	RELOCATE
REM	REMAINING
REQD	REQUIRED
RL	REFERENCE LINE
ROW	RIGHT OF WAY
RP	REFERENCE POINT
RR	RAILROAD
RT	RIGHT
RW	RETAINING WALL
S	SOUTH
SALV	SALVAGE
SAN	SANITARY
SB	SOUTHBOUND
SDWK	SIDEWALK
SE	SOUTHEAST
SF	SQUARE FEET
SHLDR	SHOULDER
SY	SQUARE YARD
SS	STORM SEWER
SSD	STOPPING SIGHT DISTANCE
STA	STATION
STD	STANDARD
STH	STATE HIGHWAY TRUNK
STM	STORM
STP	SEWAGE TREATMENT PLANT
STRUCT	STRUCTURE OR STRUCTURAL
SW	SOUTHWEST
TAN	TANGENT
T	TOWN (T WHEN USED FOR TELEPHONE LINE)
TEL	TELEPHONE
TEMP	TEMPORARY
TLE	TEMPORARY LIMITED EASEMENT
TOC	TOP OF CURB
TOW	TOP OF WATER
TRANS	TRANSITION
TYP	TYPICAL
UG	UNDERGROUND
USH	US HIGHWAY
VC	VERTICAL CURVE
VERT	VERTICAL
VOL	VOLUME
VPC	VERTICAL POINT OF CURVATURE
VPI	VERTICAL POINT OF INTERSECTION
VPRC	VERTICAL POINT OF REVERSE CURVE
VPT	VERTICAL POINT OF TANGENCY
W	WEST
WB	WESTBOUND
WM	WATERMAIN
WSO	WATER SHUTOFF VALVE
WTP	WATER TREATMENT PLANT
WV	WATER VALVE
WWTP	WASTE WATER TREATMENT PLANT
YD	YARD

MAPPING & TOPOGRAPHY SYMBOLOGY

DESCRIPTION	SYMBOL	
	EXISTING	PROPOSED
BENCHMARK		
BUSH		
CATCH BASIN		
CABLE TV BOX	CTV	
CONTROL POINT		
ELECTRICAL BOX	E	
EROSION CONTROL – INELT		
FIELD INLET		
GAS VALVE	GV	
HEDGE		
HYDRANT		
IRON PIPE		
LIGHTPOLE		
MAILBOX	MB	
MANHOLE ELECTRIC	E	
MANHOLE SANITARY	SS	SS
MANHOLE STORM	ST	ST
MONTORING WELL	MW	
POWER POLE		
SIGN BASE		
SIGN		
SIGNAL HEAD, TRAFFIC SIGNAL STANDARD, PEDESTAL BASE		
SIGNAL HEAD, TRAFFIC SIGNAL POLE, TRANSFORMER BASE		(xx)
STUMP		
TELEPHONE MANHOLE	TEL	
TELEPHONE PEDESTAL	TEL	
TREE		
WELL	W	
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	100'–8" PVC SAN San
EXISTING STORM SEWER LINE	(SIZE AND MATERIAL) ST
PROPOSED STORM SEWER LINE	100'–8" PVC STM ST
EXISTING WATER MAIN LINE	(SIZE AND MATERIAL) W
PROPOSED WATER MAIN LINE	100'–8" PVC WM (TEE–BEND) 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
SILT FENCE EROSION CONTROL	
EXISTING FIBER OPTIC	FO
EXISTING MAJOR CONTOUR	615
EXISTING MINOR CONTOUR	612
PROPOSED MAJOR CONTOUR	615
PROPOSED MINOR CONTOUR	612
PROFILE	
EXISTING SANITARY SEWER LINE	(SIZE AND MATERIAL)
PROPOSED SANITARY SEWER LINE	100'–8" PVC SAN @ 0.40%
EXISTING STORM SEWER LINE	(SIZE AND MATERIAL)
PROPOSED STORM SEWER LINE	100'–8" PVC STM @ 1.0%
EXISTING WATER MAIN LINE	(SIZE AND MATERIAL)
PROPOSED WATER MAIN LINE	PROPOSE 8" PVC WM

PATCH SYMBOLS

ASPHALTIC CONCRETE PAVEMENT

PORTLAND CEMENT CONCRETE

CRUSHED AGGREGATE BASE COURSE

DE PERE

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

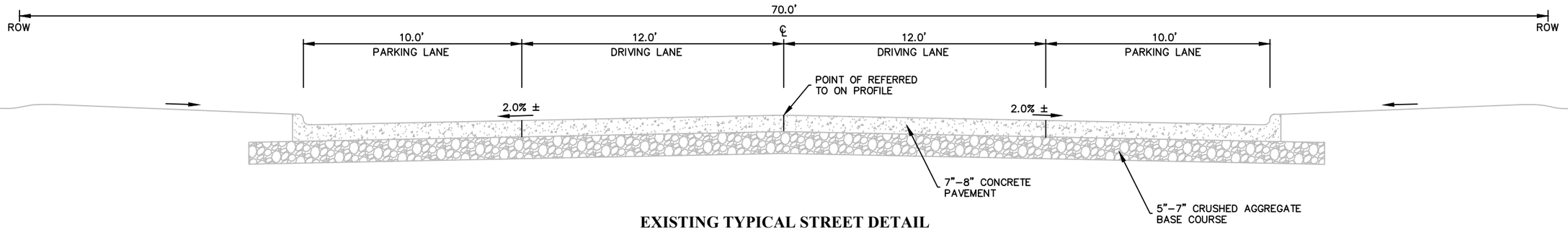
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19–18

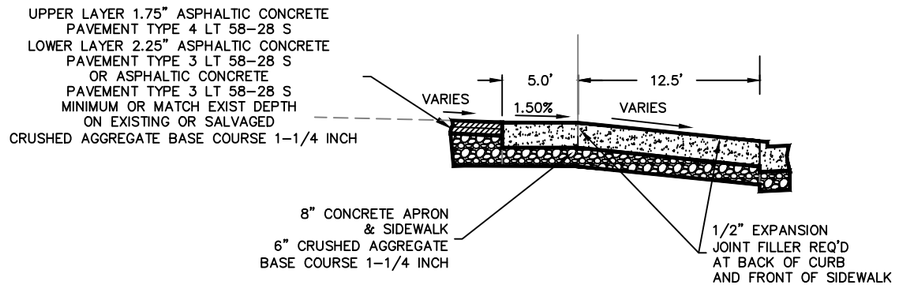
	BY	DATE
SURVEYED		
DRAWN	MAL	02–2019
DESIGNED		
CHECKED		

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

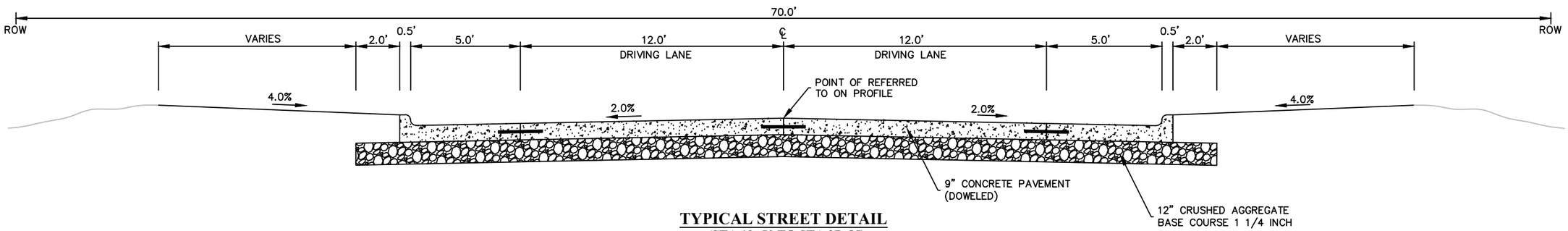
PAGE NO. **G002**



EXISTING TYPICAL STREET DETAIL



TYPICAL DRIVEWAY DETAIL



TYPICAL STREET DETAIL
(STA 19+50 TO STA 27+85)

2'
0 2.5' 5' 0

DE PERE

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OFFICE 920–339–4061 FAX 920–339–4071

ENTERPRISE DRIVE
TYPICAL SECTION DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

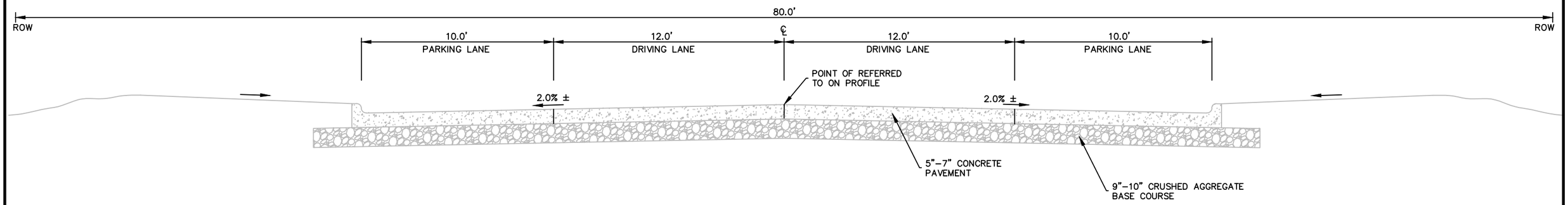
PROJECT # 19–18

	BY	DATE
SURVEYED	BJK	08–2018
DRAWN	MAL	02–2019
DESIGNED	MAL	02–2019
CHECKED	CKK	02–2019

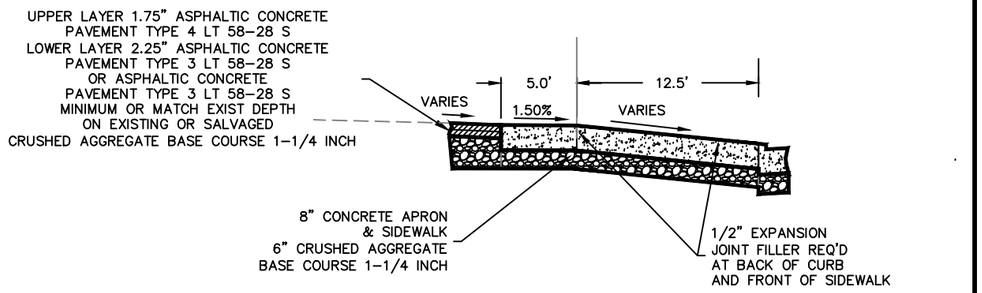
REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

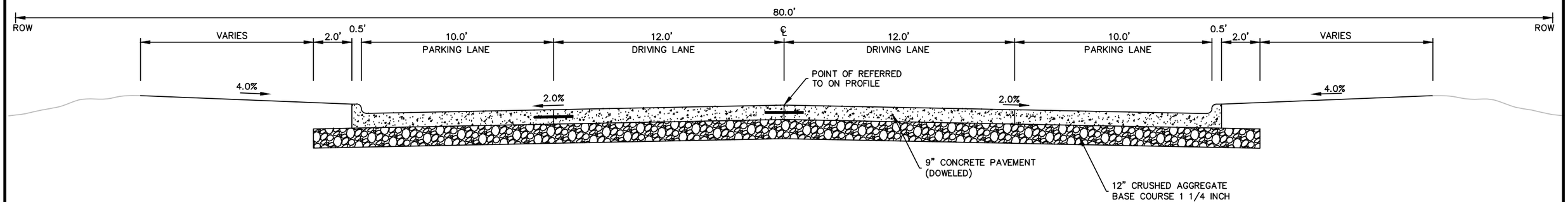
PAGE NO. G003



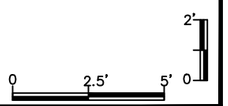
EXISTING TYPICAL STREET DETAIL



TYPICAL DRIVEWAY DETAIL



TYPICAL STREET DETAIL
(STA 51+00 TO STA 64+40)



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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920–339–4061 FAX 920–339–4071

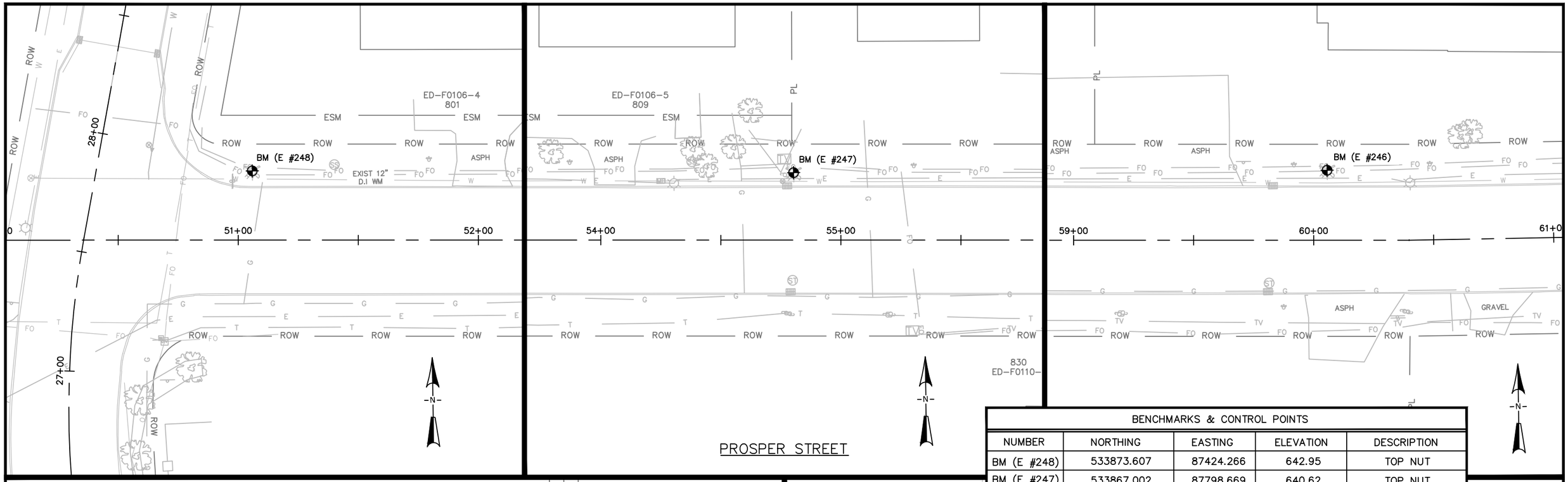
PROSPER STREET
TYPICAL SECTION DETAILS

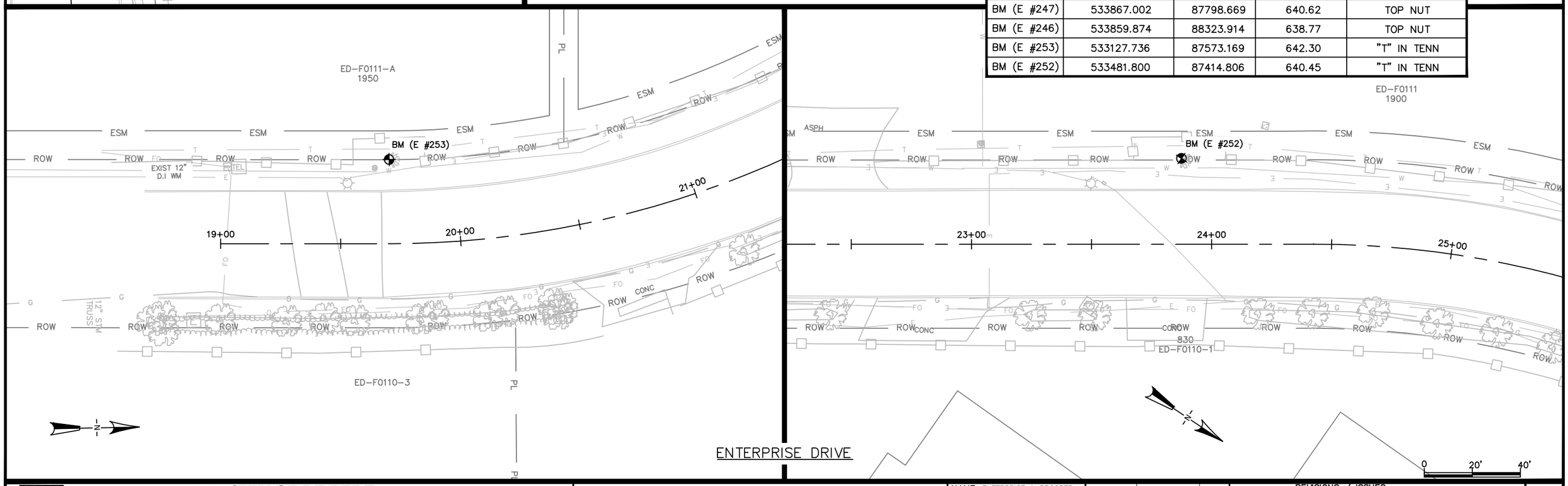
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19–18

	BY	DATE
SURVEYED	BJK	08–2018
DRAWN	MAL	02–2019
DESIGNED	MAL	02–2019
CHECKED	CKK	02–2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **G004**





BENCHMARKS & CONTROL POINTS				
NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM (E #248)	533873.607	87424.266	642.95	TOP NUT
BM (E #247)	533867.002	87798.669	640.62	TOP NUT
BM (E #246)	533859.874	88323.914	638.77	TOP NUT
BM (E #253)	533127.736	87573.169	642.30	"T" IN TENN
BM (E #252)	533481.800	87414.806	640.45	"T" IN TENN

DE PERE

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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET & ENTERPRISE DRIVE
BENCHMARKS AND CONTROL POINTS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

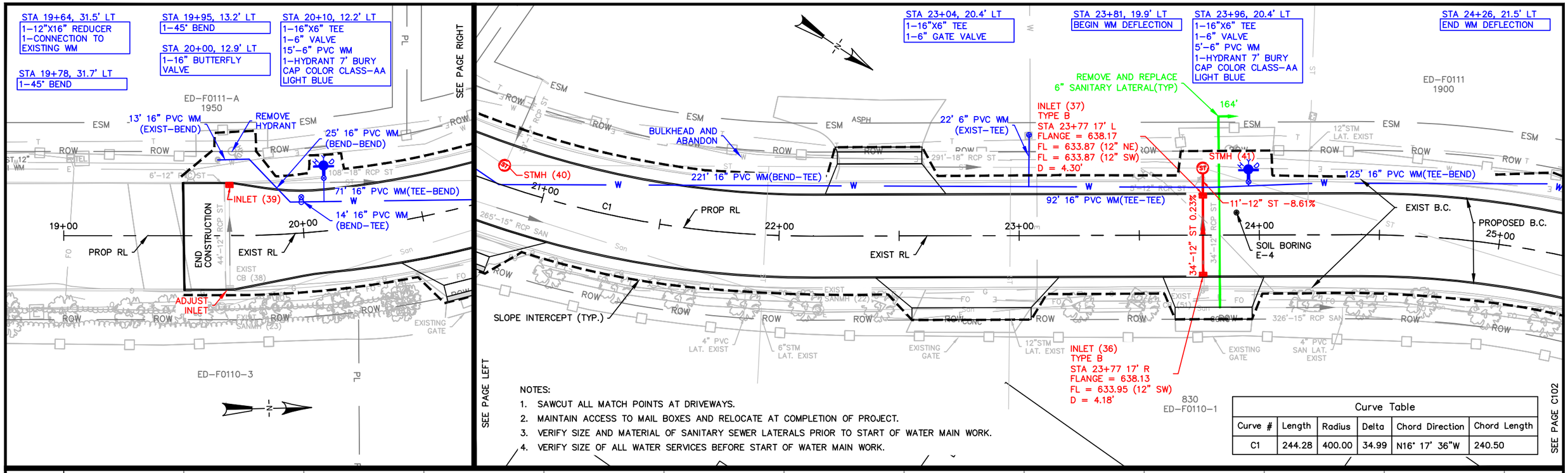
PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

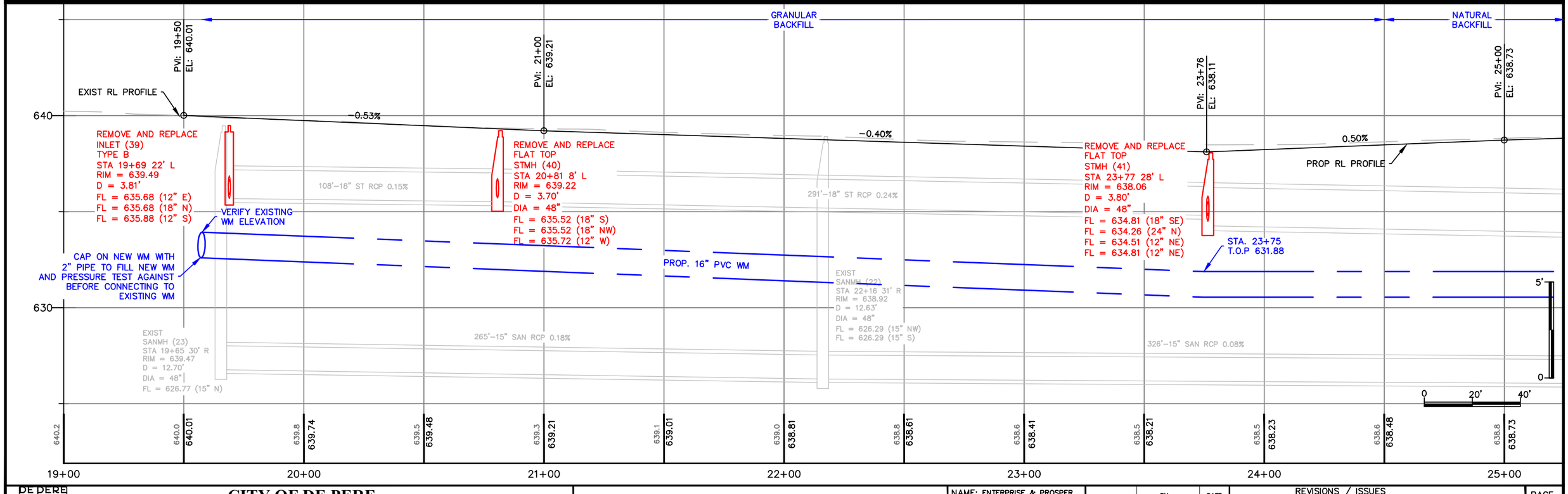
REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

PAGE NO. G005



Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C1	244.28	400.00	34.99	N16° 17' 36"W	240.50



CITY OF DE PERE	ENTERPRISE DRIVE	NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY		BY	DATE	REVISIONS / ISSUES				PAGE NO.
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115	1200' N/O MILLENNIUM CT TO 250' S/O PROSPER ST	PROJECT # 19–18	SURVEYED	BJK	08–2018	NO.	DATE	BY	REMARKS	C101
OFFICE 920–339–4061 FAX 920–339–4071			DRAWN	MAL	02–2019					
			DESIGNED	MAL	02–2019					
			CHECKED	CKK	02–2019					

STA 25+16, 28.1' LT
1-22° BEND

STA 25+74, 21.5' LT
1-22° BEND

STA 27+43, 33.6' LT
1-CONNECTION TO EXISTING WM

STA 27+52, 21.4' RT
1-16"X12" TEE

STA 27+75, 21.4' RT
1-16"X16" TEE

STA 27+85, 31.4' LT
EXISTING VALVE BASE IN PLACE IN OFF POSITION. VALVE BOX HAS BEEN REMOVED AND EXISTING WATERMAIN HAS BEEN ABANDONED TO THE NORTH.

STA 27+99, 21.4' RT
1-REMOVE EXISTING 12"X16" REDUCER
1-CONNECTION TO EXISTING WM

NOTES:
1. SAWCUT ALL MATCH POINTS AT DRIVEWAYS.
2. MAINTAIN ACCESS TO MAIL BOXES AND RELOCATE AT COMPLETION OF PROJECT.
3. VERIFY SIZE AND MATERIAL OF SANITARY SEWER LATERALS PRIOR TO START OF WATER MAIN WORK.
4. VERIFY SIZE OF ALL WATER SERVICES BEFORE START OF WATER MAIN WORK.

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C2	313.24	400.00	44.87	N11° 21' 16"W	305.30

SEE PAGE C101

BULKHEAD AND SM ABANDON

ABANDONED VALVE SEE NOTE ABOVE

ABANDONED

REMOVE VALVE

56' 12" PVC WM(EXIST-TEE)

END CONSTRUCTION

SOIL BORING E-3

23' 16" PVC WM (TEE-EXIST)

PROP RL

182' 16" PVC WM(BEND-BEND)

182' 16" PVC WM(BEND-TEE)

SLOPE INTERCEPT (TYP.)

EXIST RL

EXIST B.C.

23' 16" PVC WM (TEE-TEE)

CAP ON NEW WM WITH 2" PIPE TO FILL NEW WM AND PRESSURE TEST AGAINST BEFORE CONNECTING TO EXISTING WM

ED-F0111
1900

RECONSTRUCT SANMH (21)

PROPOSED B.C.

PROSPER STREET
SEE PAGE C103

EXIST SANMH (26)

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C3	62.74	40.50	88.76	S46° 31' 01"W	56.65

Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C4	62.07	35.50	100.19	S39° 00' 46"E	54.46

NATURAL BACKFILL

GRANULAR BACKFILL

PVI: 25+00
EL: 638.73

PVI: 27+25
EL: 639.63

PVI: 28+35
EL: 639.18

RECONSTRUCT MH REMOVE AND REPLACE 4' OF MH SECTION WITH CONE SECTION, RINGS AND CASTING. ROTATE CONE OUT OF CURB LINE.

0.50%

0.40%

-0.41%

PROP RL PROFILE

EXIST RL PROFILE

EXIST STMH (42) STA 27+32 29' L RIM = 640.71 D = 7.33' DIA = 48" FL = 633.46 (24" S) FL = 633.46 (48" E) FL = 633.38 (21" N) FL = 636.06 (12" W) FL = 634.65 (8" W)

366'-24" ST RCP 0.22%

292'-21" ST RCP 0.46%

16" PVC WM

STA. 26+34 T.O.P 631.88
MAINTAIN 1.5' CLEARANCE

STA. 26+32 T.O.P 631.88
MAINTAIN 1.5' CLEARANCE

STA. 27+75
T.O.P 631.88

STA. 28+00
T.O.P 633.78

OFFSET WM TO MATCH EXISTING

EXIST SANMH (21) STA 25+48 17' R RIM = 638.76 D = 12.72' DIA = 48" FL = 626.04 (15" N) FL = 626.04 (15" SE)

140'-15" SAN RCP 0.11%

EXIST SANMH (20) STA 26+96 25' R RIM = 639.83 D = 13.95' DIA = 48" FL = 625.88 (18" N) FL = 625.88 (15" S)

389'-18" SAN RCP 0.09%

640

630

5'

0

0 20' 40'

638.5	638.6	638.8	639.0	639.1	639.4	639.6	639.7	639.8	639.2	639.9
638.23	638.48	638.73	638.93	639.13	639.33	639.53	639.53	639.32		

24+00 25+00 26+00 27+00 28+00 29+00

DE PERE

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE
250' S/O PROSPER ST TO PROSPER STREET

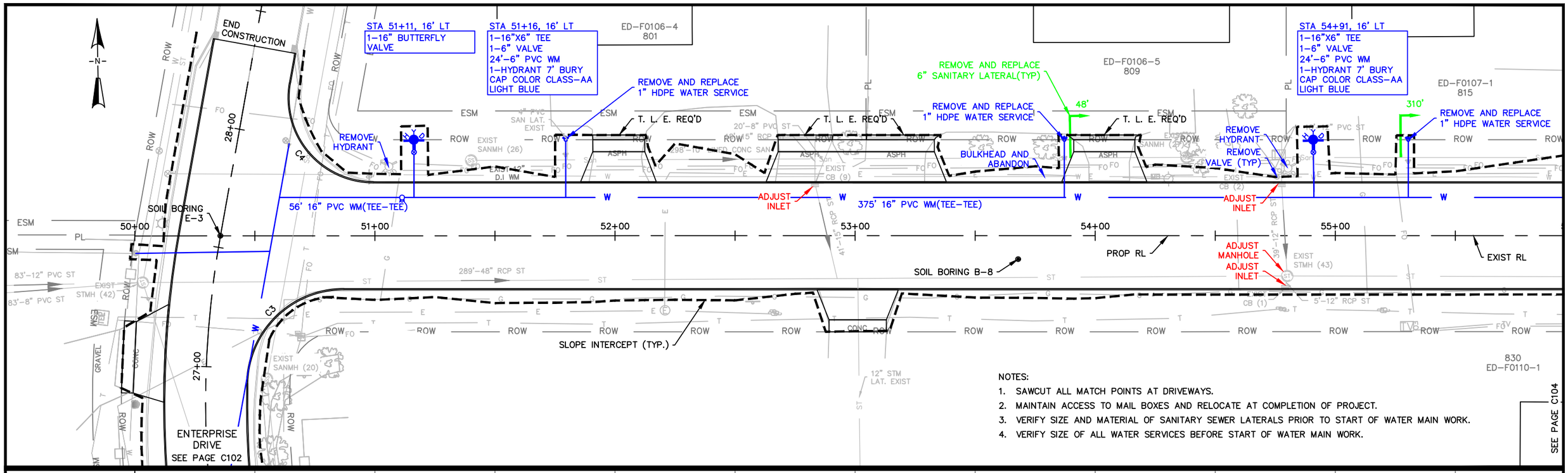
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

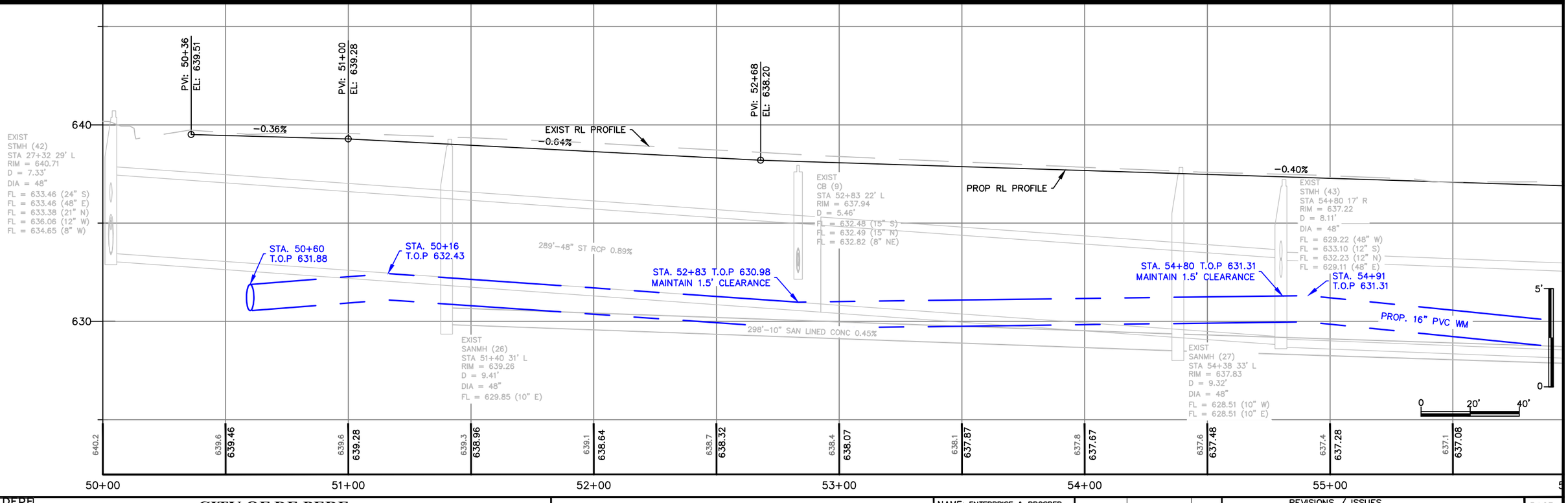
PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C102





DE PERE	**CITY OF DE PERE** ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	**PROSPER STREET** **ENTERPRISE DR TO 600' E/O ENTERPRISE DR**

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C103

STA 58+10, 16' LT
1-16" BUTTERFLY VALVE

STA 60+15, 16' LT
1-16"X6" TEE
1-6" VALVE
24'-6" PVC WM
1-HYDRANT 7' BURY
CAP COLOR CLASS-AA LIGHT BLUE

ED-F0107-1
815

ED-F0106-4
825

ED-F0102-1
845

T. L. E. REQ'D

BULKHEAD AND ABANDON

29'

REMOVE AND REPLACE
2" HDPE WATER SERVICE
USE AS BLOWOFF FOR WM TESTING

SAWCUT

REMOVE AND REPLACE
1" HDPE WATER SERVICE

108'

REMOVE HYDRANT

399'-10" LINED CONC SAN

12" STM LAT. EXIST.

4" PVC SAN LAT. EXIST

18'-8" PVC ST

194'-10" LINED CONC SAN

125'-10" LINED CONC SAN

EXIST SANMH (28)

EXIST SANMH (30)

W
230' 16" PVC WM(TEE-TEE)

294' 16" PVC WM(TEE-TEE)

237' 16" PVC WM(TEE-TEE)

ADJUST INLET

56+00 57+00 58+00 59+00 60+00 61+00 62+00

EXIST RL

PROP RL

502'-48" RCP ST

469'-48" RCP ST

40'-12" RCP ST

EXIST STMH (3)

10' 48" SPOT REPAIR

ADJUST MANHOLE

ADJUST INLET

REMOVE AND REPLACE
1" HDPE WATER SERVICE

110'

168'

47'

REMOVE AND REPLACE
6" SANITARY LATERAL(TYP)

SLOPE INTERCEPT (TYP.)

EXIST CB (13)

ASPH

GRAVEL

CONC

T. L. E. REQ'D

REMOVE AND REPLACE
1" HDPE WATER SERVICE

12" STM LAT. EXIST.

8" STM LAT. EXIST.

830
ED-F0110-1

850
ED-F0112

SEE PAGE C103

SEE PAGE C105

STA 57+21 16' LT
1-16"X8" TEE
1-8" VALVE
56'-8" PVC WM

N

NOTES:
1. SAWCUT ALL MATCH POINTS AT DRIVEWAYS.
2. MAINTAIN ACCESS TO MAIL BOXES AND RELOCATE AT COMPLETION OF PROJECT.
3. VERIFY SIZE AND MATERIAL OF SANITARY SEWER LATERALS PRIOR TO START OF WATER MAIN WORK.
4. VERIFY SIZE OF ALL WATER SERVICES BEFORE START OF WATER MAIN WORK.

PVI: 57+00
EL: 636.48

PVI: 60+21
EL: 634.94

PROP RL PROFILE

EXIST RL PROFILE

-0.48%

-1.02%

254' FROM DOWNSTREAM MANHOLE UTILITY PROTRUDING THRU PIPE WALL, VERIFY UTILITY AND NOTIFY ENGINEER, 48" STORM WILL BE REPAIRED WITH CONCRETE CROWN

EXIST SANMH (28)
STA 58+37 33' L
RIM = 636.58
D = 9.68'
DIA = 48"
FL = 626.90 (10" W)
FL = 626.90 (10" E)

117' FROM DOWNSTREAM MANHOLE UTILITY PROTRUDING THRU PIPE WALL,VERIFY UTILITY AND NOTIFY ENGINEER, 48" STORM WILL BE REPAIRED WITH CONCRETE CROWN

EXIST STMH (3)
STA 59+81 18' R
RIM = 635.00
D = 8.48'
DIA = 48"
FL = 626.67 (48" W)
FL = 626.52 (48" E)
FL = 630.15 (12" N)
FL = 631.01 (12" S)

EXIST SANMH (29)
STA 60+31 34' L
RIM = 634.89
D = 8.63'
DIA = 48"
FL = 626.27 (10" W)
FL = 626.26 (10" E)

EXIST SANMH (30)
STA 61+57 30' L
RIM = 633.66
D = 8.00'
DIA = 48"
FL = 625.79 (10" W)
FL = 625.66 (10" E)

343' FROM DOWNSTREAM MANHOLE UTILITY PROTRUDING THRU PIPE WALL, VERIFY UTILITY AND NOTIFY ENGINEER, 48" STORM WILL BE REPAIRED WITH CONCRETE CROWN

STA. 56+00
T.O.P 629.93

STA. 59+82
T.O.P 628.67

STA. 60+15
T.O.P 628.56

502'-48" ST RCP 0.49%

399'-10" SAN LINED CONC 0.40%

PROP. 16" PVC WM

194'-10" SAN LINED CONC 0.33%

125'-10" SAN LINED CONC 0.38%

469'-48" ST RCP 0.45%

637.1 636.88
636.8 636.68
636.6 636.48
636.4 636.24
636.2 636.00
636.0 635.76
635.8 635.52
635.6 635.28
635.2 635.04
634.8 634.64
634.2 634.14
633.7 633.63
633.2 633.12

5'
0
0 20' 40'

56+00 57+00 58+00 59+00 60+00 61+00 62+00

DE PERE

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET

600' E/O ENTERPRISE DR TO 300' W/O HWY PP

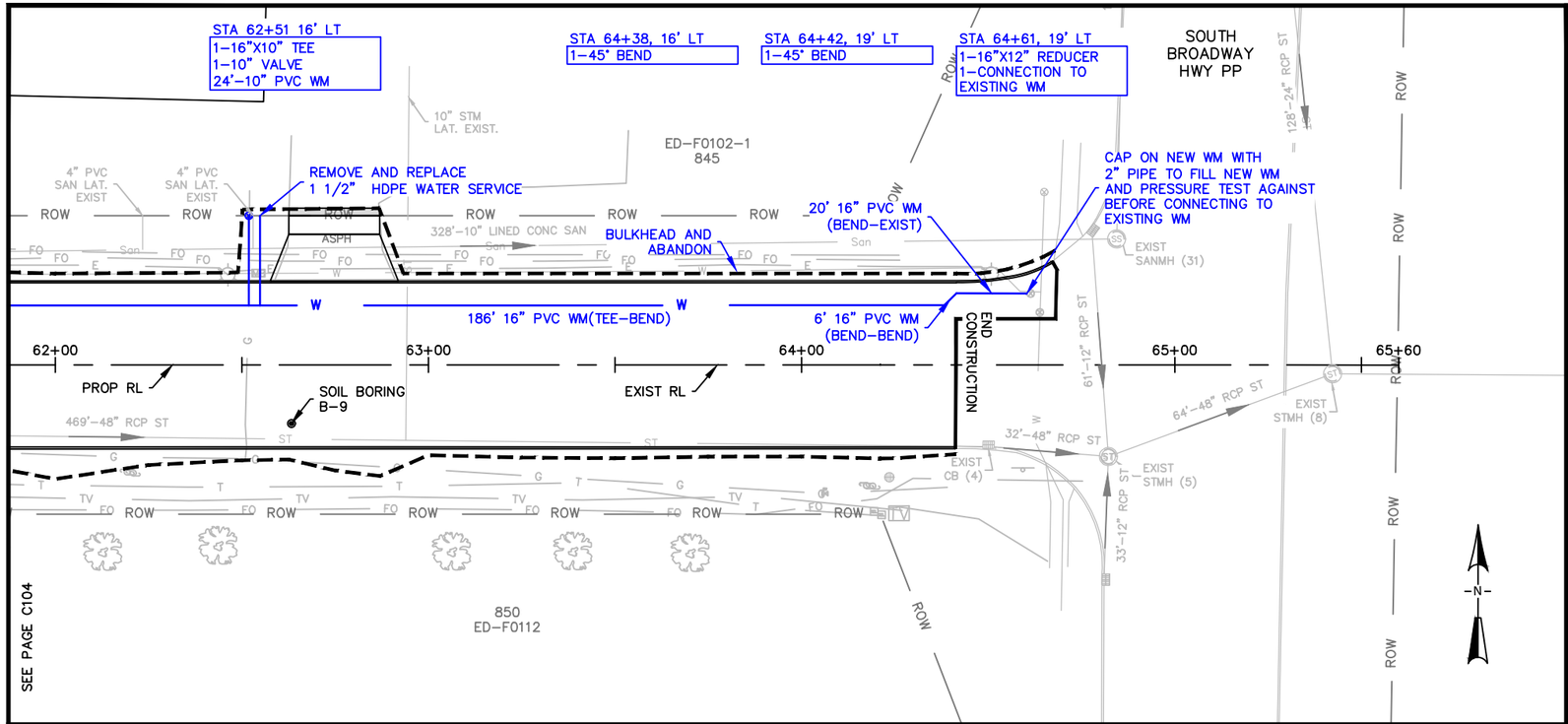
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

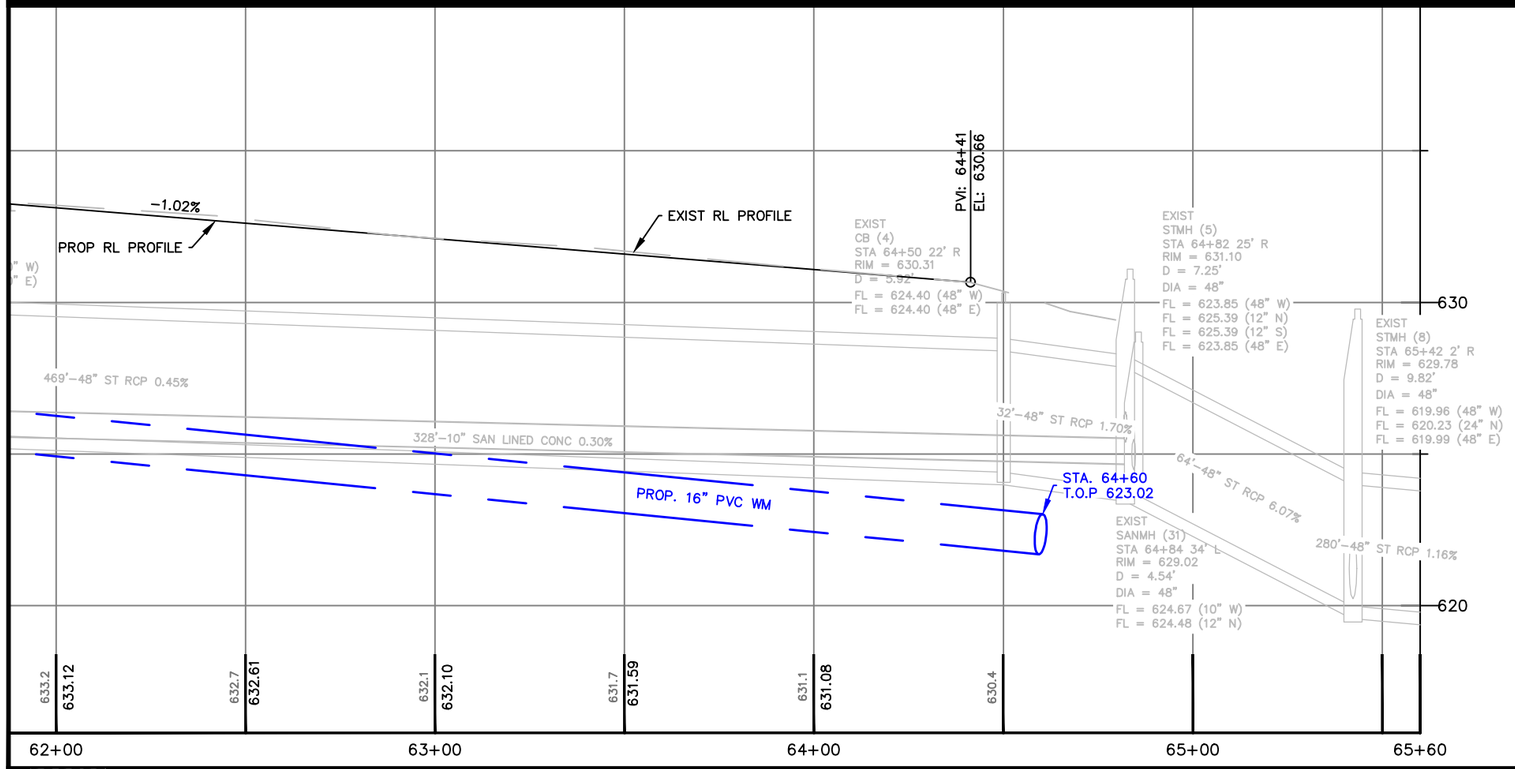
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. C104



NOTES:

1. SAWCUT ALL MATCH POINTS AT DRIVEWAYS.
2. MAINTAIN ACCESS TO MAIL BOXES AND RELOCATE AT COMPLETION OF PROJECT.
3. VERIFY SIZE AND MATERIAL OF SANITARY SEWER LATERALS PRIOR TO START OF WATER MAIN WORK.
4. VERIFY SIZE OF ALL WATER SERVICES BEFORE START OF WATER MAIN WORK.



0 20' 40'

0 5'

DE PERE	**CITY OF DE PERE** ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	**PROSPER STREET** **600' E/O ENTERPRISE DR TO HWY PP**

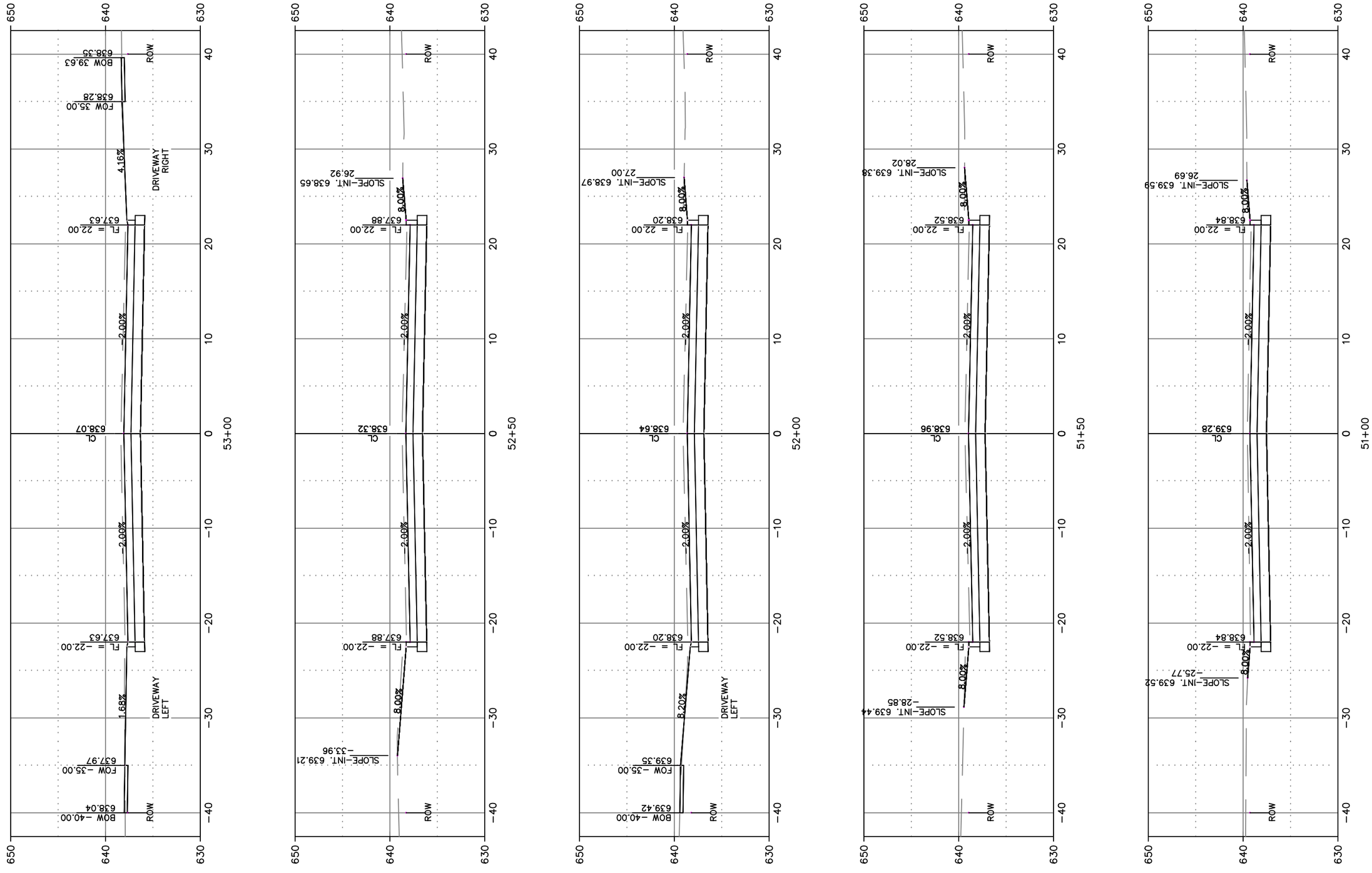
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C105



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115

OFFICE 920–339–4061 FAX 920–339–4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19–18

	BY	DATE
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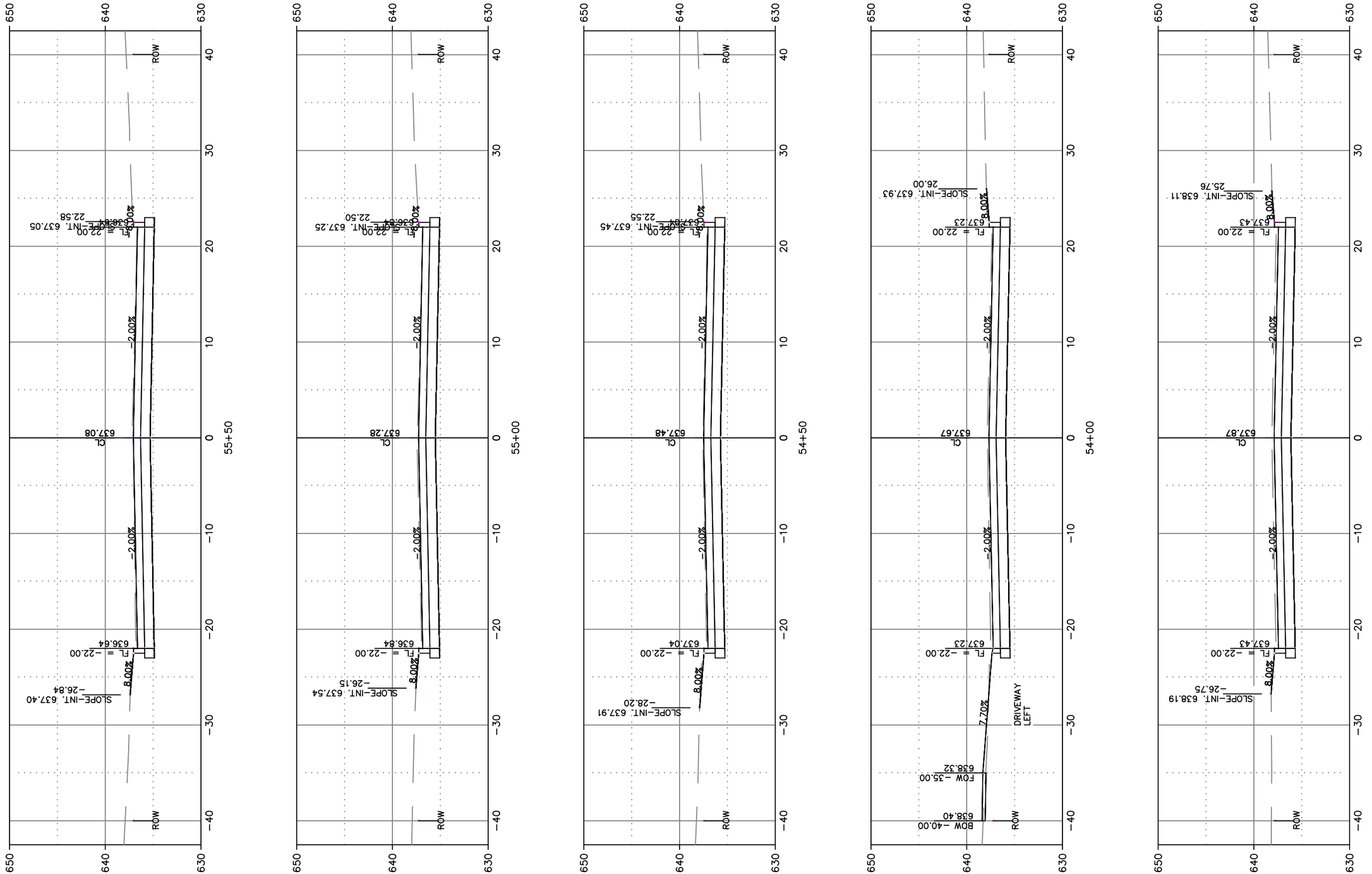
DRAWN	MAL	02–2019
DESIGNED	MAL	02–2019
CHECKED	CKK	02–2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C301**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
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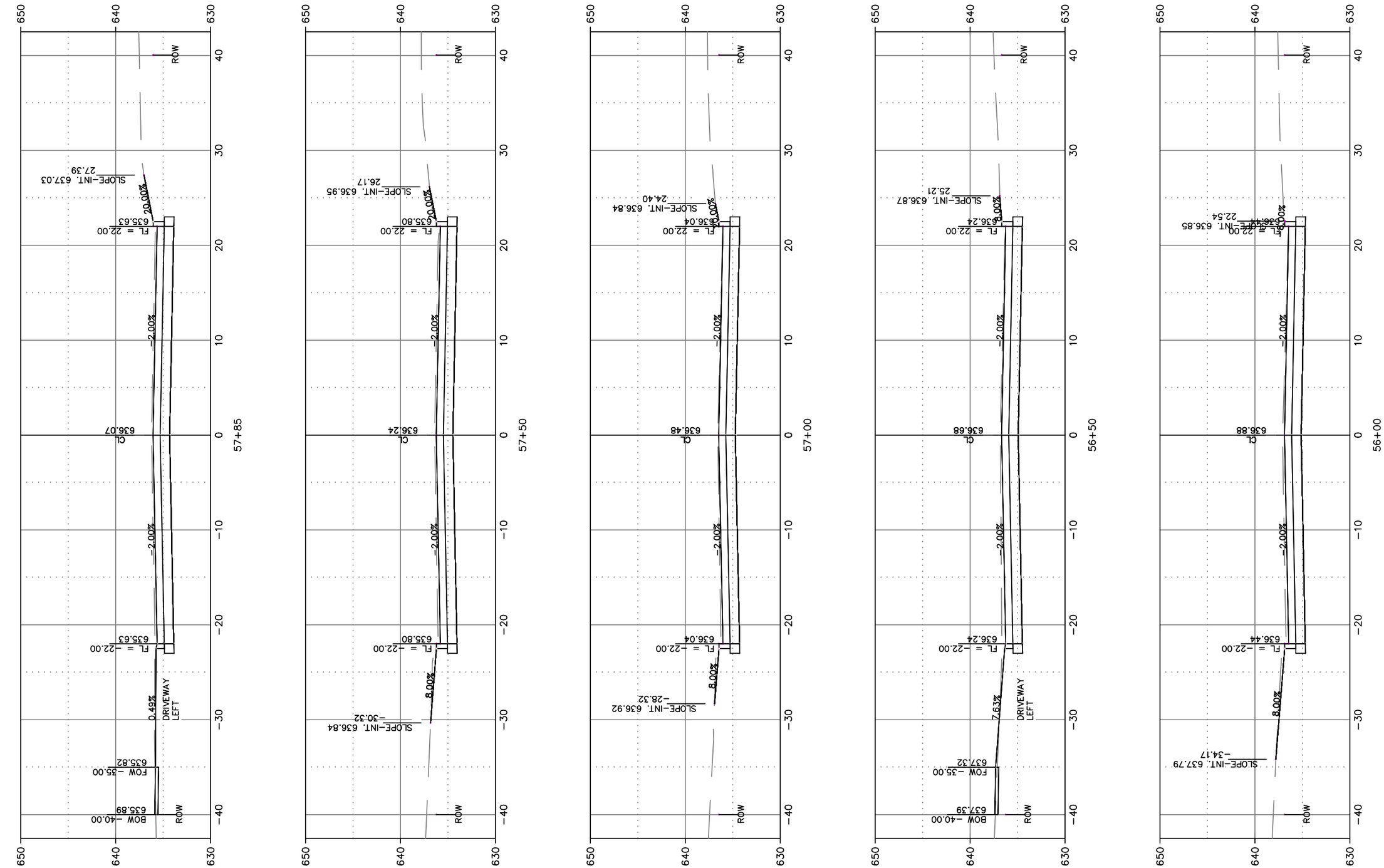
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C302**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920–339–4061 FAX 920–339–4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19–18

	BY	DATE
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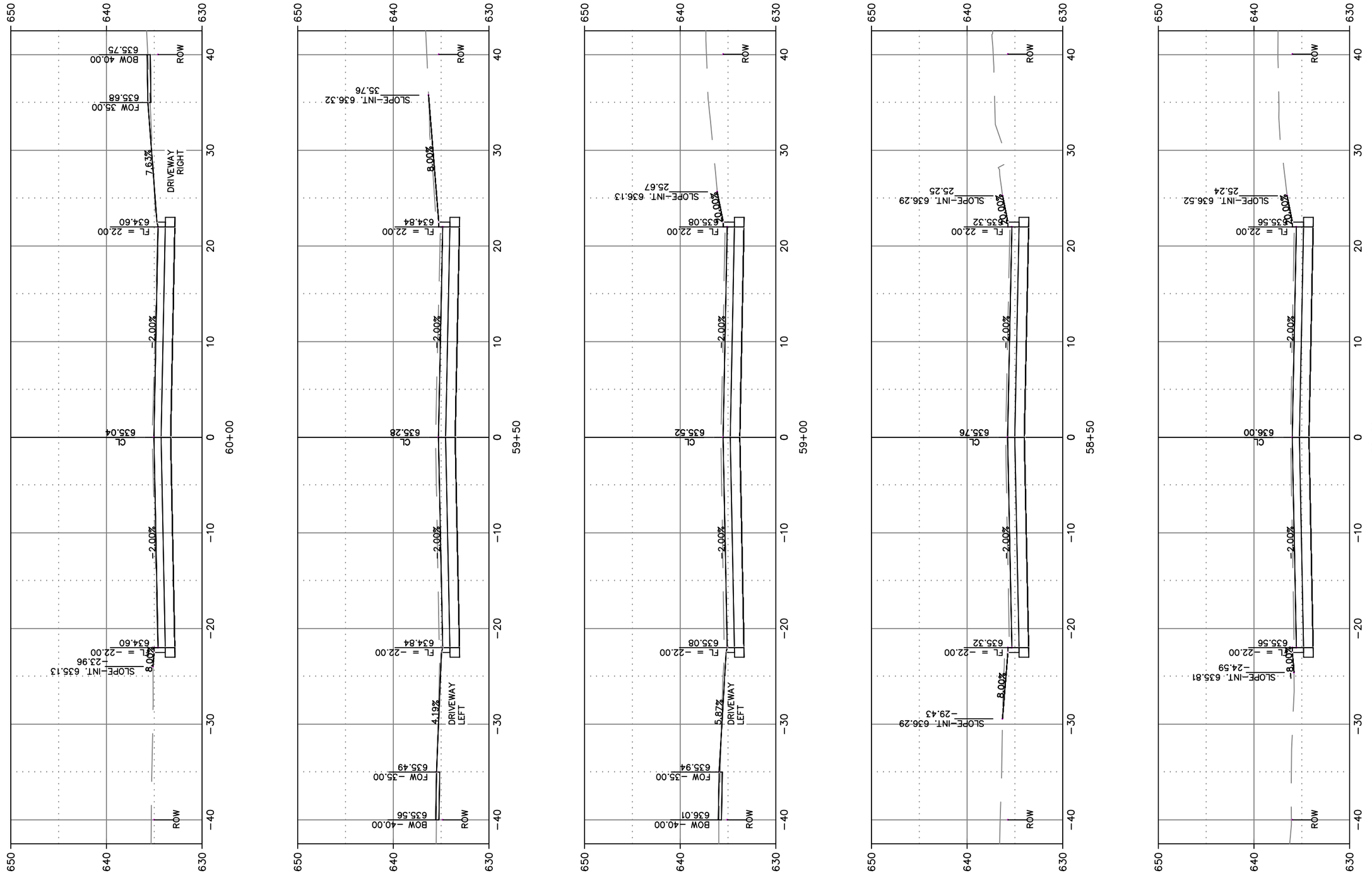
DESIGNED	MAL	02–2019
CHECKED	CKK	02–2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C303**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
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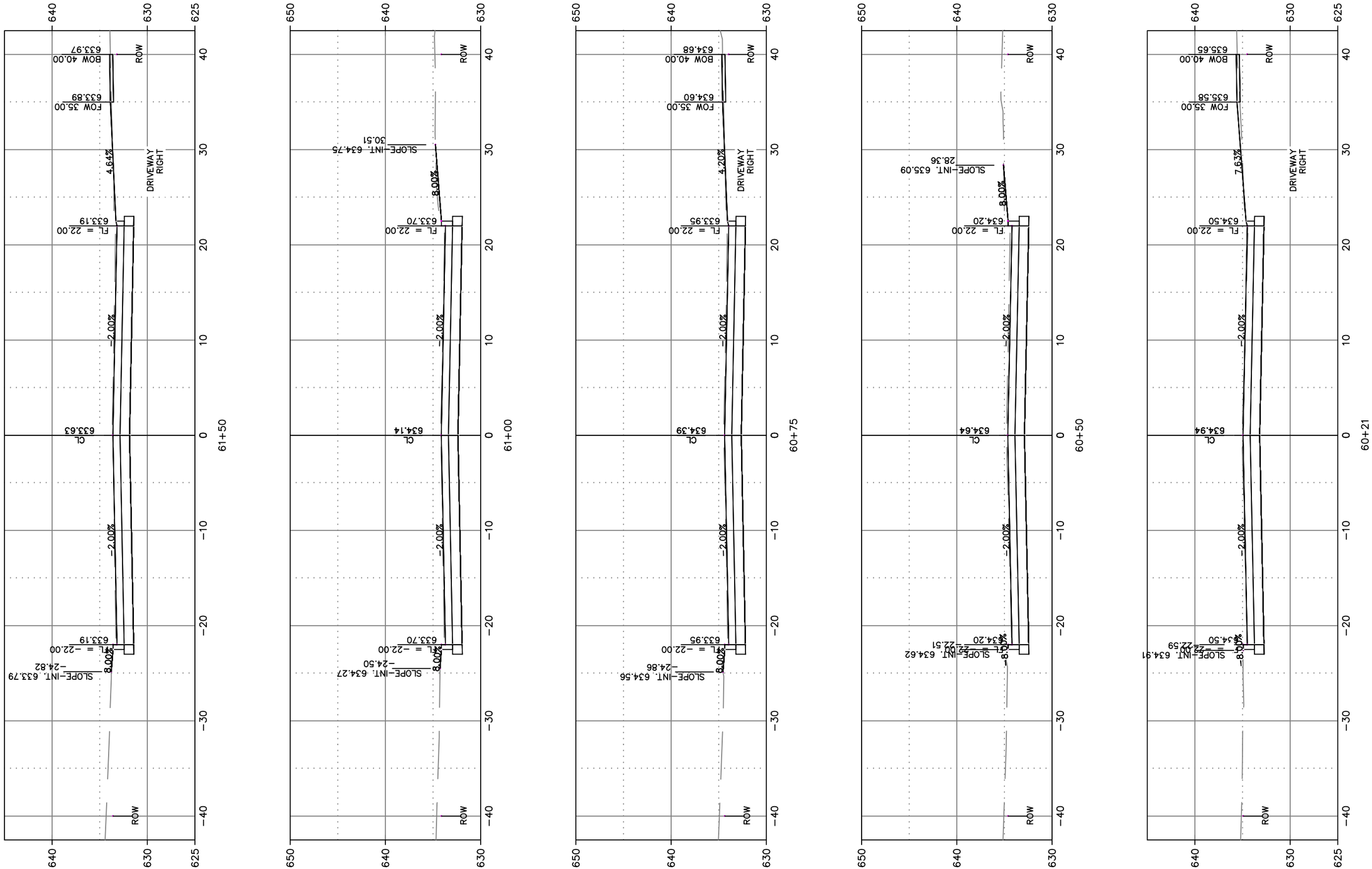
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C304**



CITY OF DE PERE

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OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
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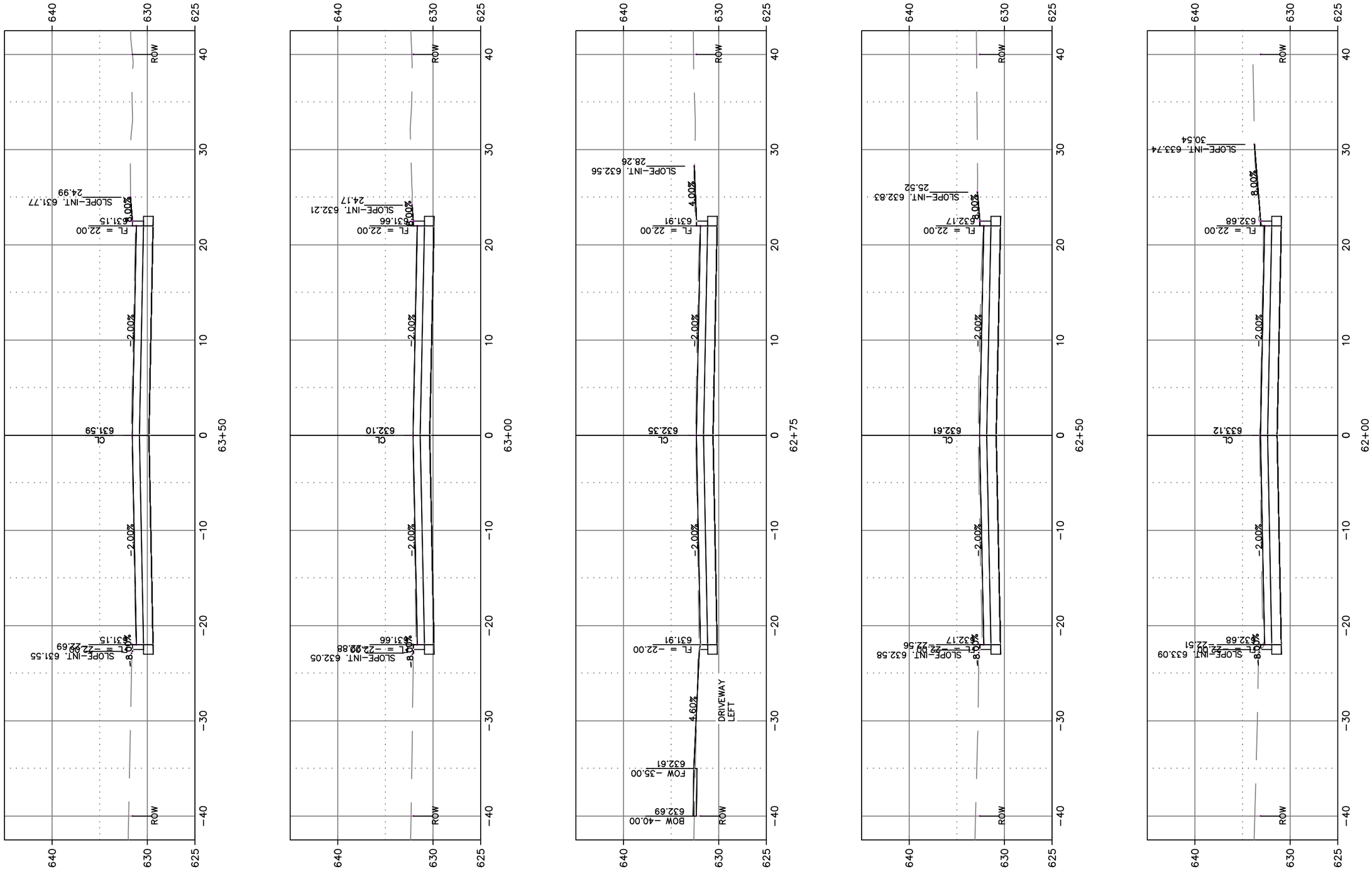
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C305



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115

OFFICE 920–339–4061 FAX 920–339–4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19–18

	BY	DATE
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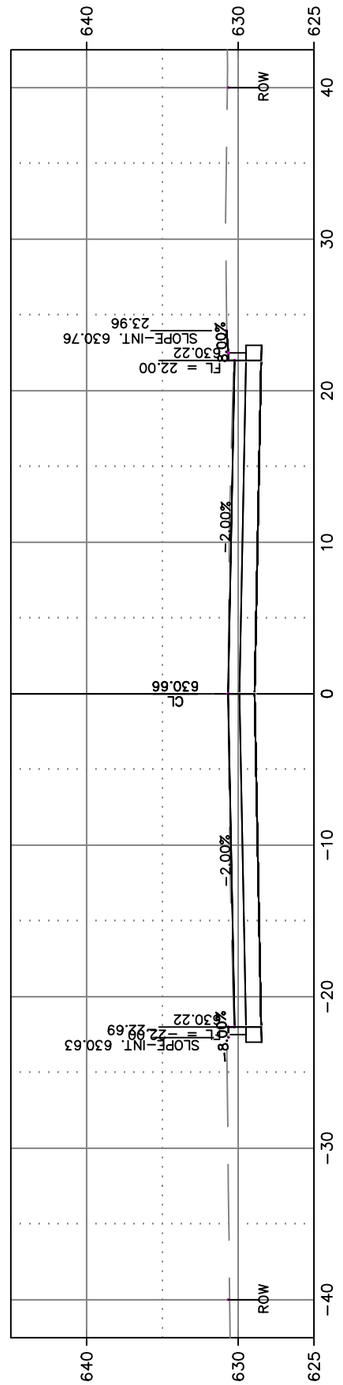
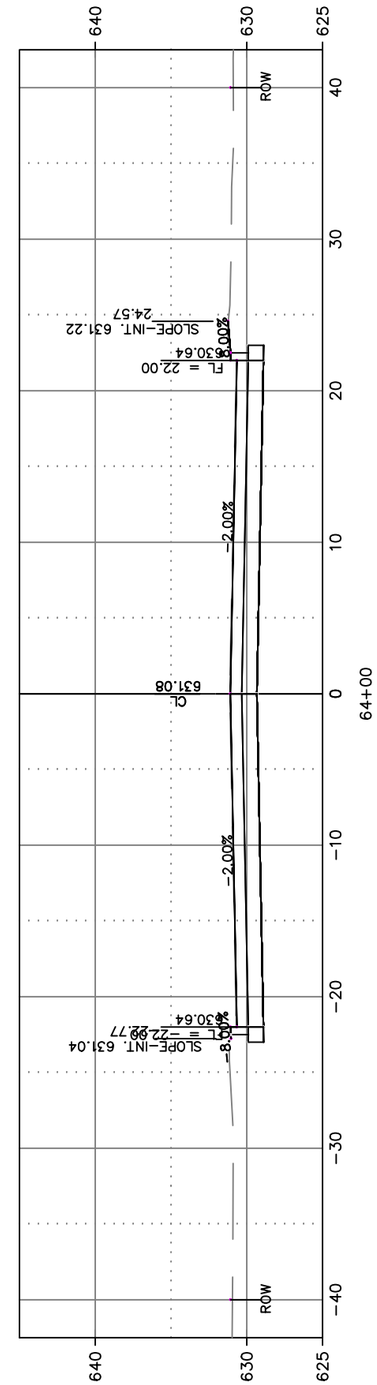
DESIGNED	MAL	02–2019
CHECKED	CKK	02–2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C306**





CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
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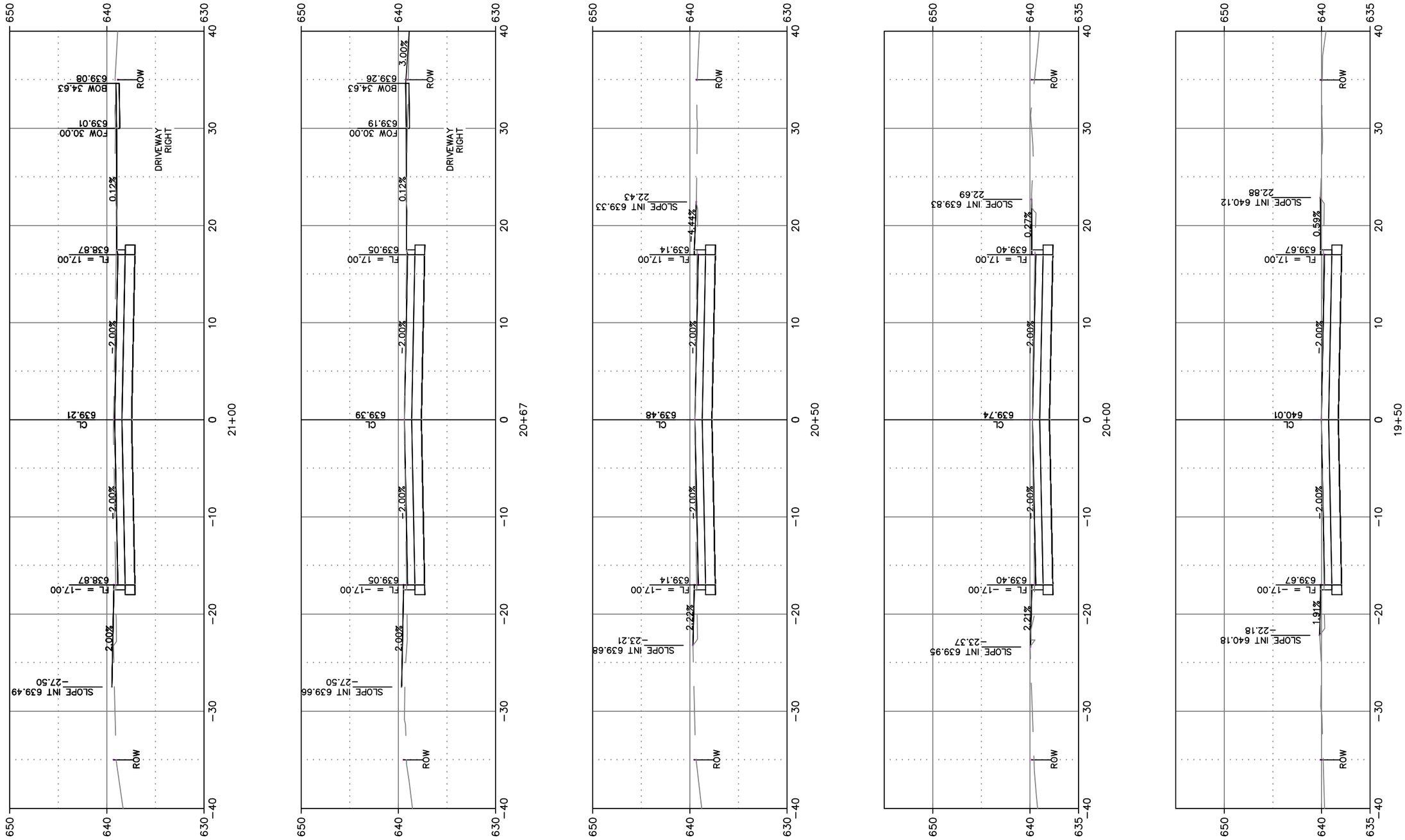
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C307**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920−339−4061 FAX 920−339−4071

ENTERPRISE DRIVE

CROSS SECTIONS

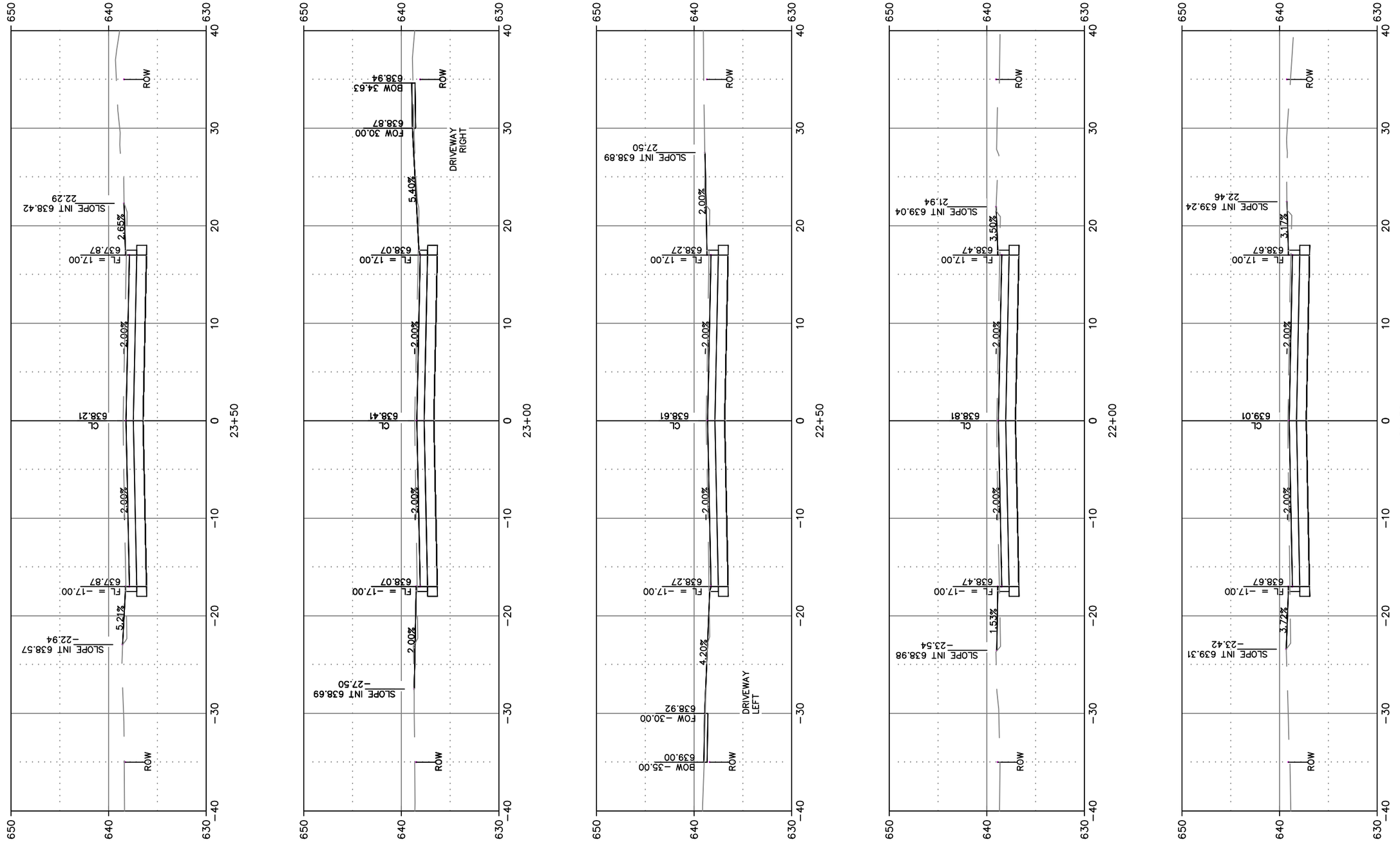
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19−18

	BY	DATE
SURVEYED	BJK	02−2019
DRAWN	MAL	02−2019
DESIGNED	MAL	02−2019
CHECKED	CKK	02−2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C308**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920−339−4061 FAX 920−339−4071

ENTERPRISE DRIVE

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19−18

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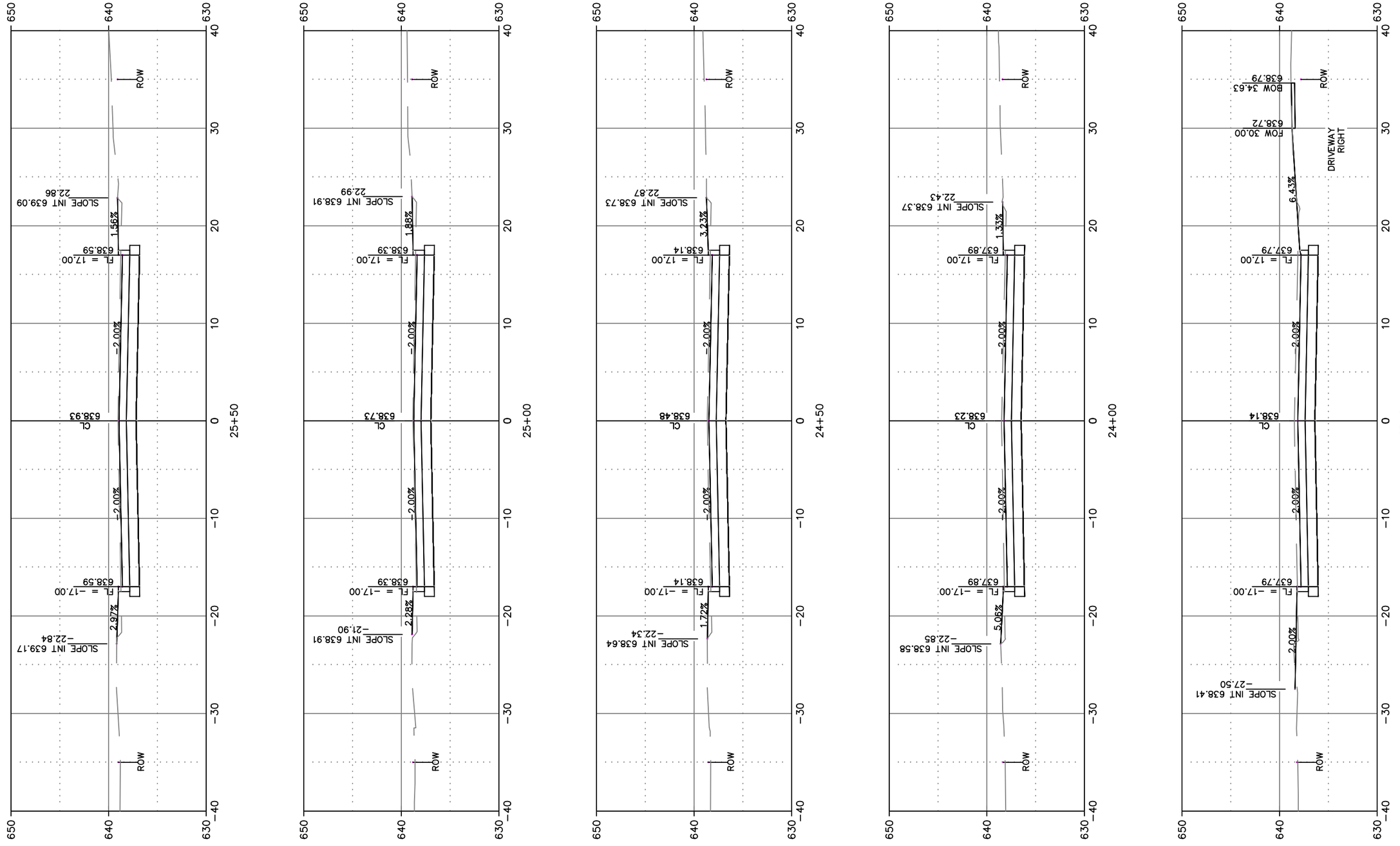
CHECKED	CKK	02−2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **C309**



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

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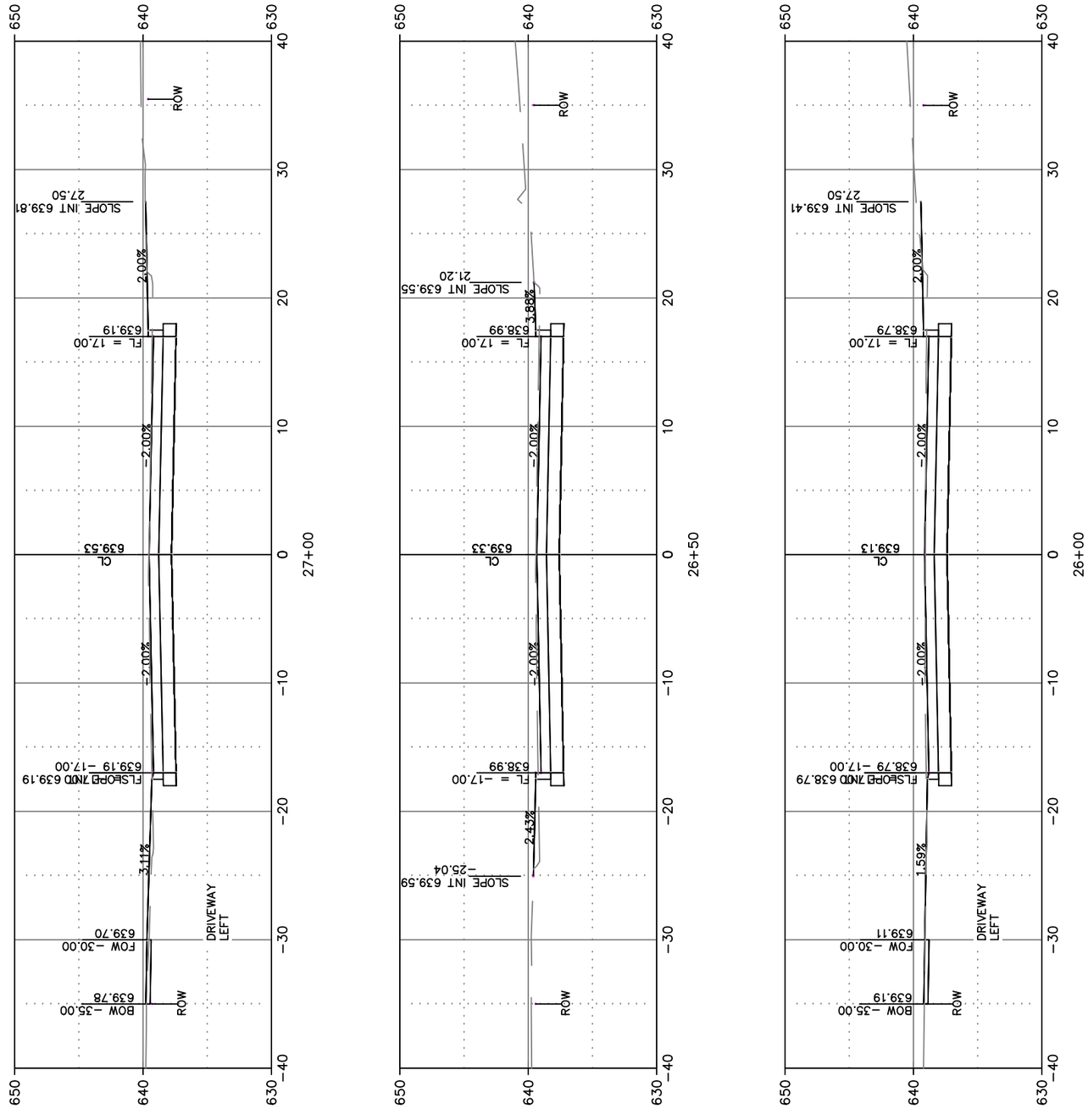
REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C310



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920−339−4061 FAX 920−339−4071

ENTERPRISE DRIVE

CROSS SECTIONS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19−18

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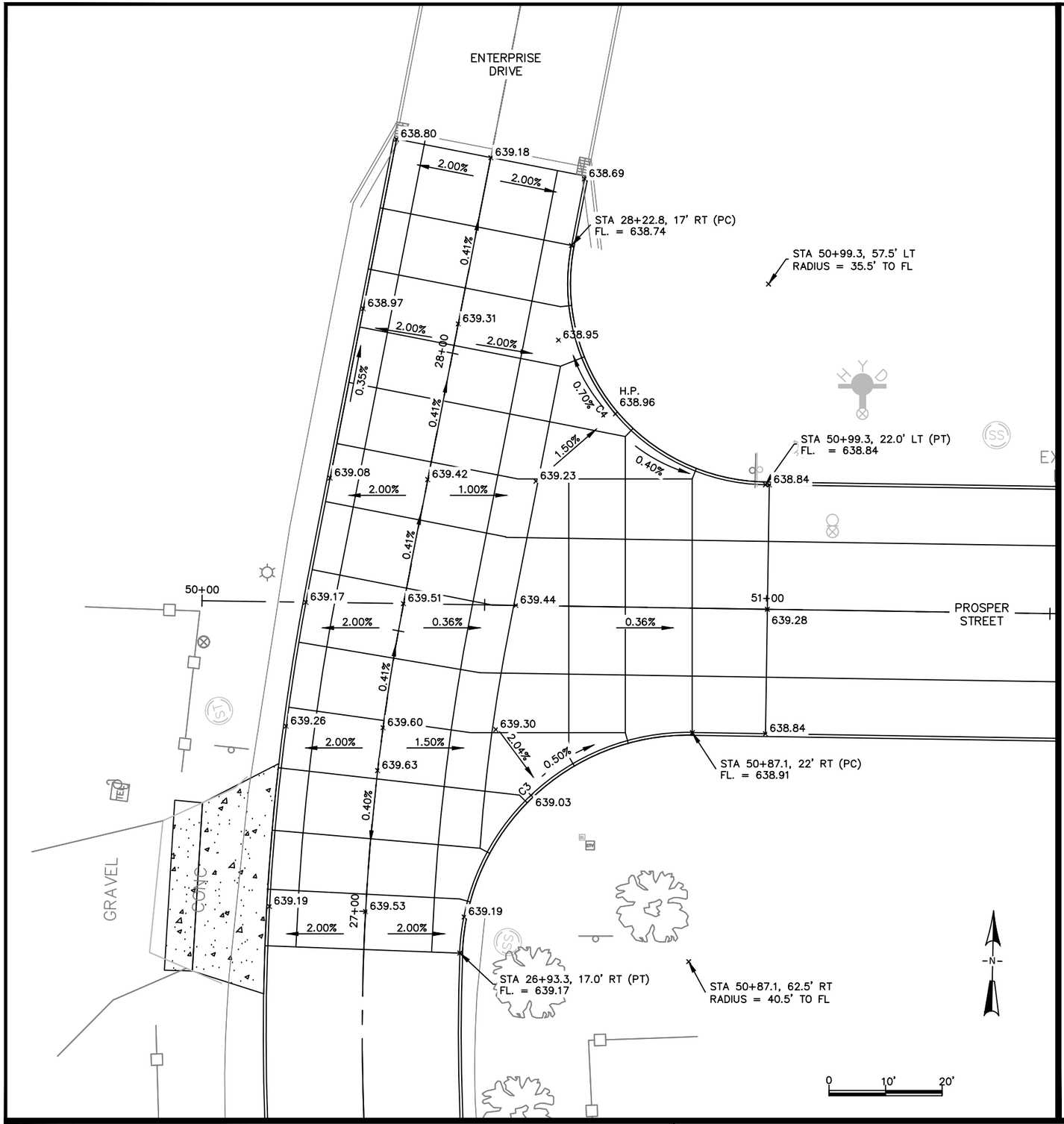
DRAWN	MAL	02−2019
DESIGNED	MAL	02−2019
CHECKED	CKK	02−2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C311



Curve Table					
Curve #	Length	Radius	Delta	Chord Direction	Chord Length
C3	62.74	40.50	88.76	S46° 31' 01"W	56.65
C4	62.07	35.50	100.19	S39° 00' 46"E	54.46

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
INTERSECTION GRADES

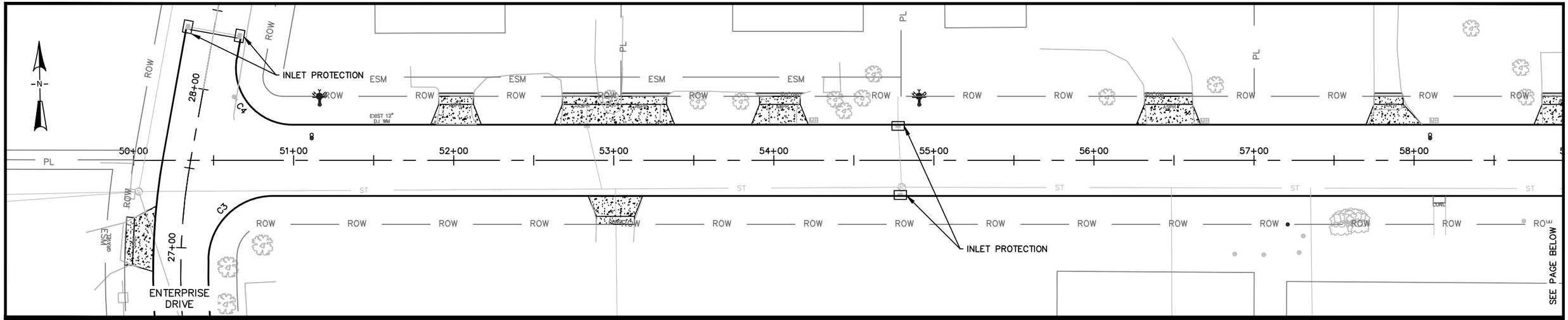
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

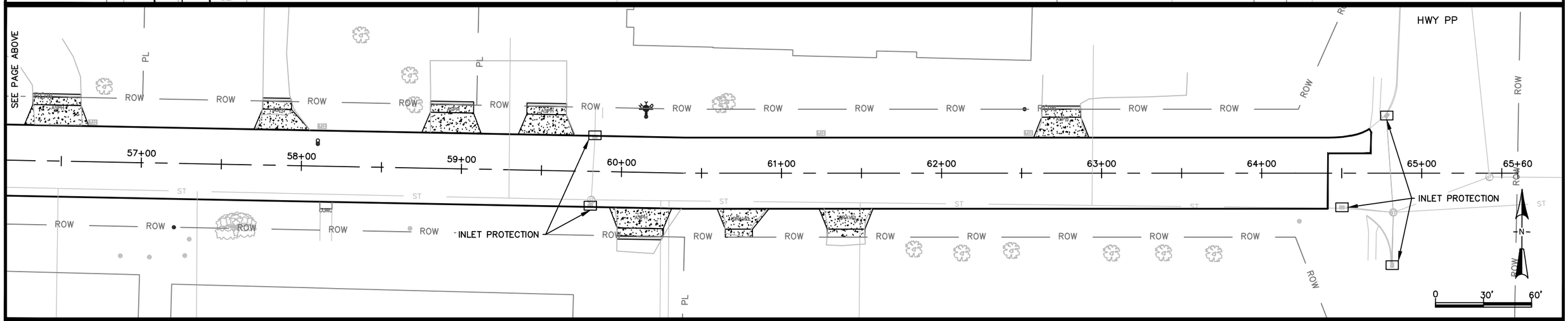
PROJECT # 19-18

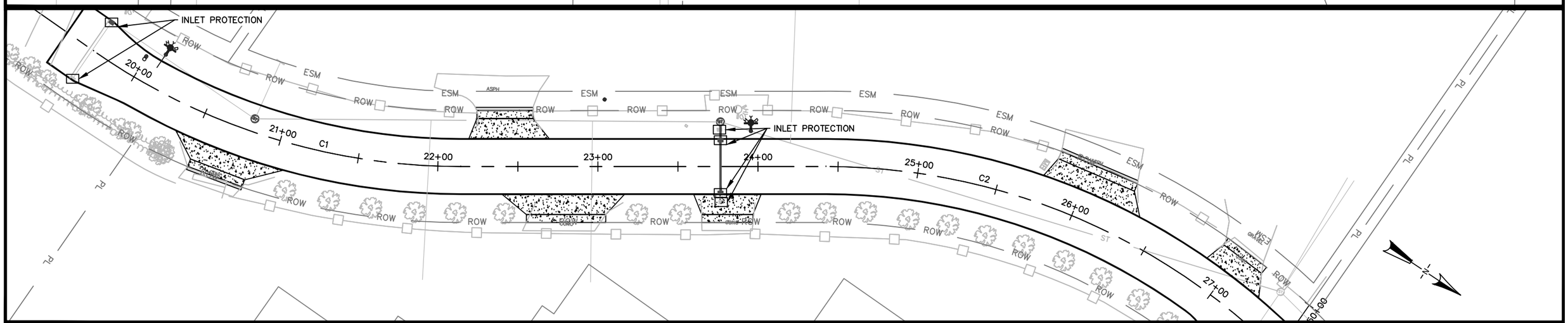
	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C401







DE PERE

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
EROSION CONTROL PLAN

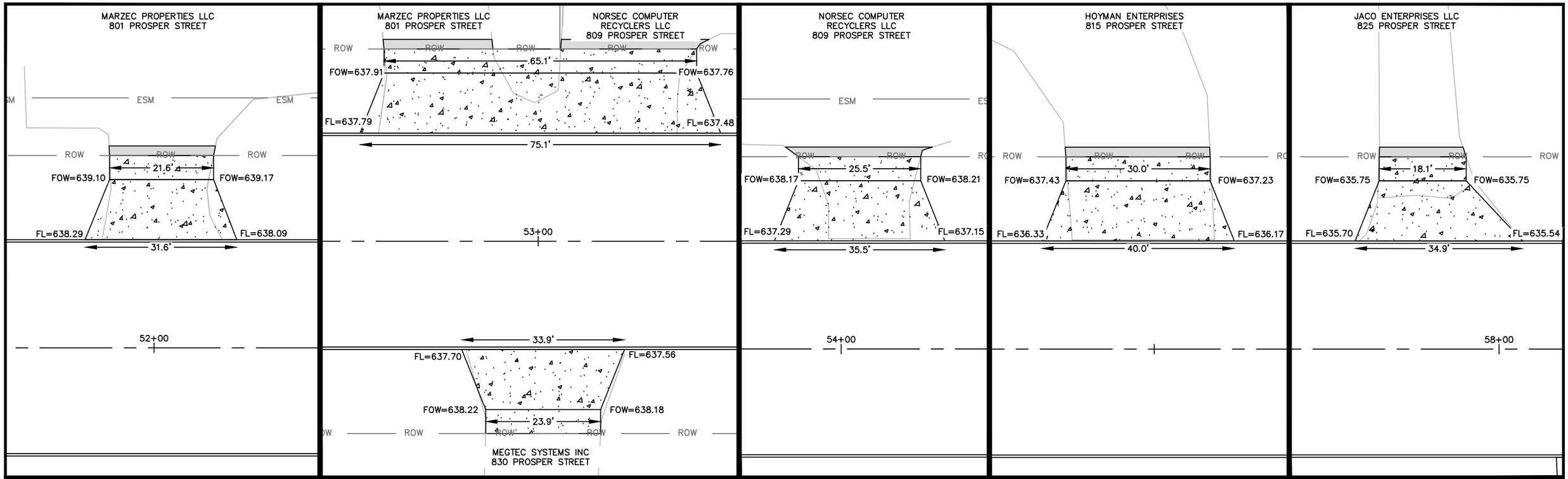
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	MAL	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

PAGE NO. C402



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET
DRIVEWAY GRADES

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

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REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

PAGE NO. **C403**

VALLEY CABINET INC
845 PROSPER STREET

ROW ROW ROW ROW

24.3'

FOW=632.66 FOW=632.35

FL=632.09 FL=631.74

34.3'

63+00

PROSPER
STREET

ENTERPRISE
DRIVE

21+00

71.1'

FL=639.20 FL=638.84

FOW=639.34 FOW=639.12

36.2'

ROW ROW ROW ROW ROW

MEGTEC SYSTEMS INC
830 PROSPER STREET

ESM ESM ESM ESM

LFRE I LLC
1900 ENTERPRISE DRIVE

ESM

ROW ROW ROW ROW ROW ROW ROW ROW ROW ROW

35.2'

FOW=638.87 FOW=638.92

FL=638.39 FL=638.20

50.2'

22+00 23+00

ENTERPRISE
DRIVE

76.3'

FL=638.29 FL=638.01

FOW=638.93 FOW=638.73

49.6'

ROW ROW ROW ROW ROW ROW ROW ROW ROW

MEGTEC SYSTEMS INC
830 PROSPER STREET

ENTERPRISE
DRIVE

24+00

42.0'

FL=637.83 FL=637.90

FOW=638.80 FOW=638.63

32.0'

ROW ROW ROW ROW

MEGTEC SYSTEMS INC
830 PROSPER STREET

LFRE I LLC
1900 ENTERPRISE DRIVE

ESM ESM ESM ESM

ROW ROW ROW ROW ROW ROW ROW ROW

FOW=638.95

51.6'

FOW=639.22

FL=638.69

65.2'

FL=638.94

26+00

ENTERPRISE
DRIVE

ROW

LFRE I LLC
1900 ENTERPRISE DRIVE

ESM ESM ESM

ROW ROW ROW ROW ROW

29.9'

FOW=639.60 FOW=639.67

FL=639.13 FL=639.29

40.8'

ENTERPRISE
DRIVE

27+00

0 10' 20'

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

PROSPER STREET & ENTERPRISE DRIVE

DRIVEWAY GRADES

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

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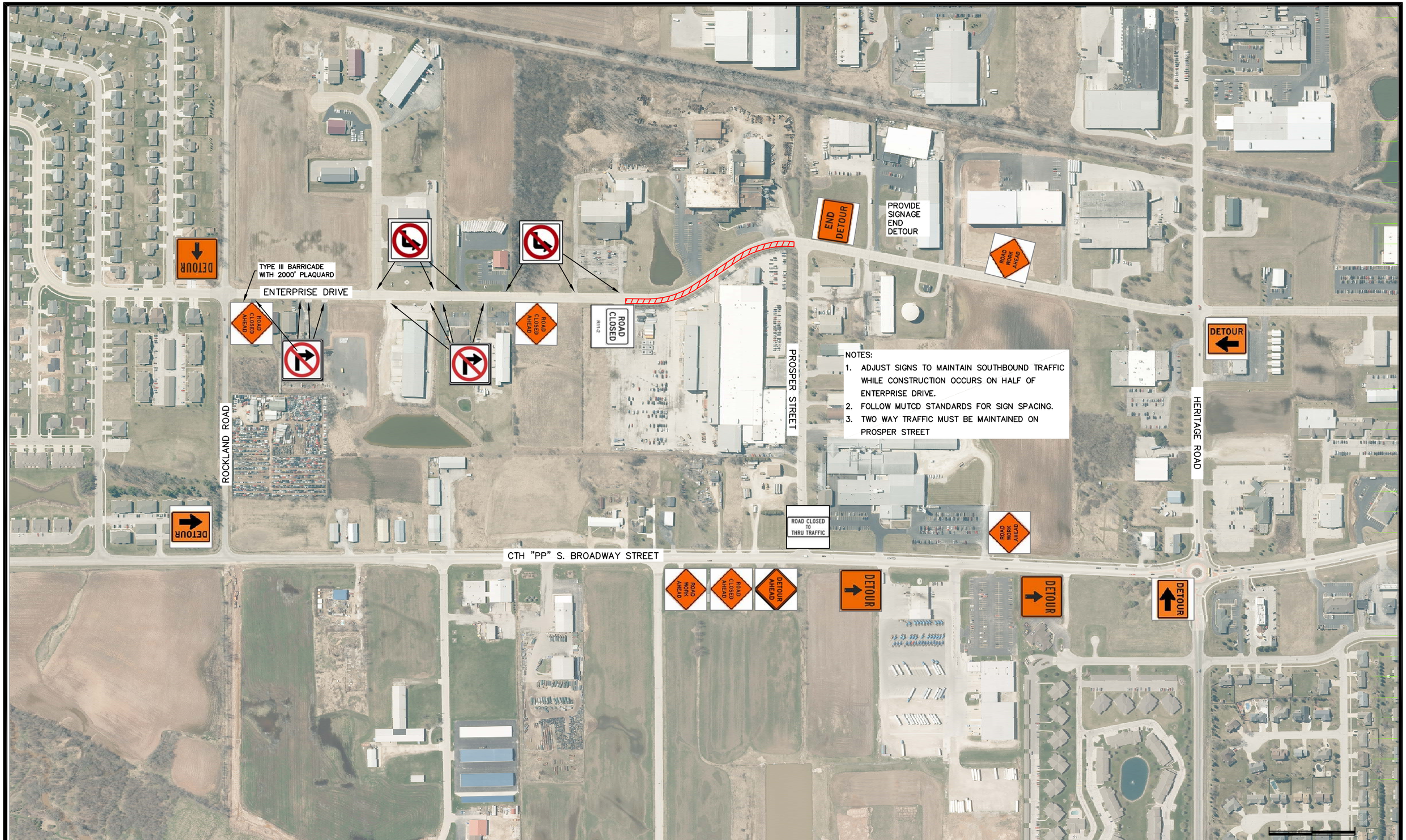
REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

PAGE NO. C404



CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE

DETOUR ROUTE TRAFFIC CONTROL SOUTH BOUND TRAFFIC

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

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NO.	DATE	BY	REMARKS

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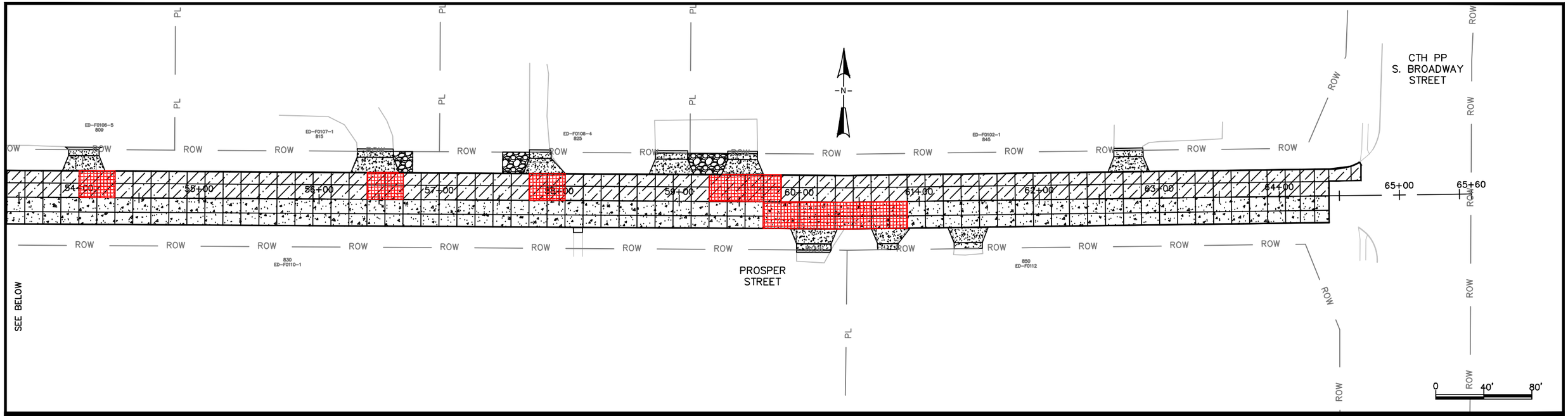

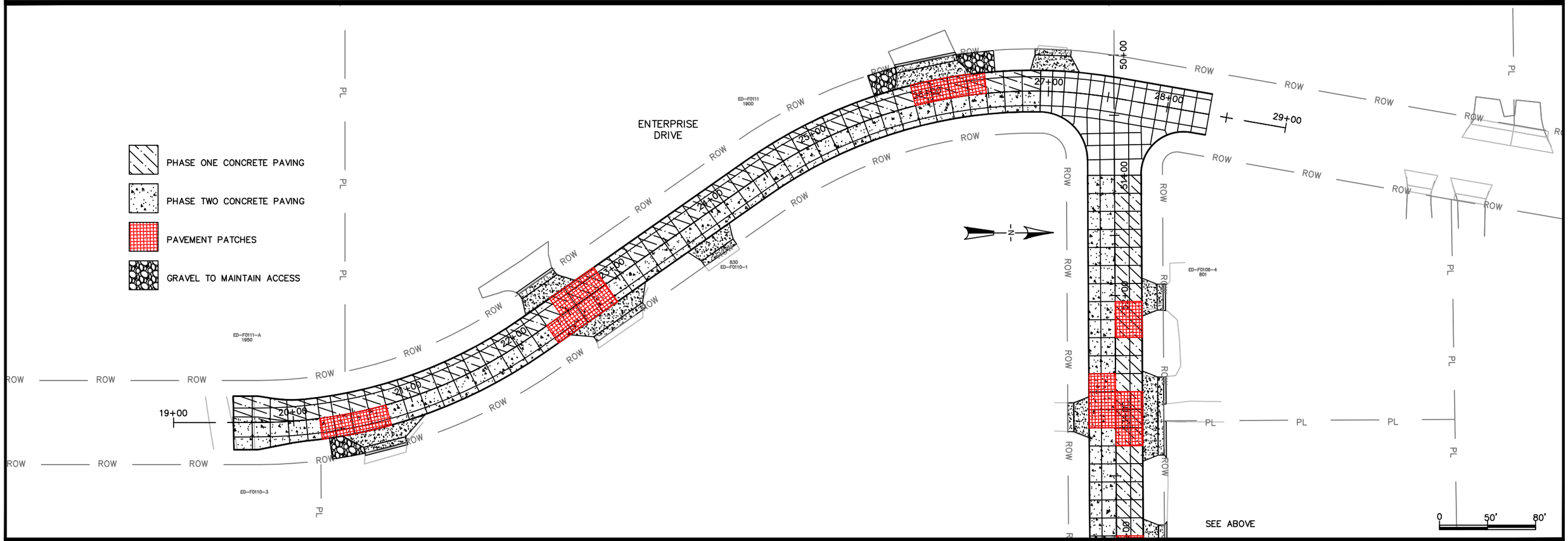

DE PERE	**CITY OF DE PERE** ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115 OFFICE 920–339–4061 FAX 920–339–4071	**ENTERPRISE AND PROSPER** **CONCRETE PAVEMENT STAGING**

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19–18

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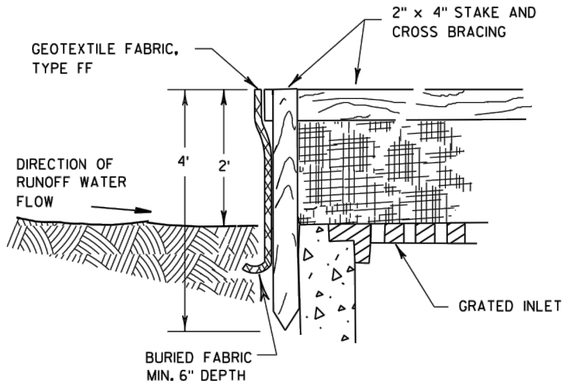
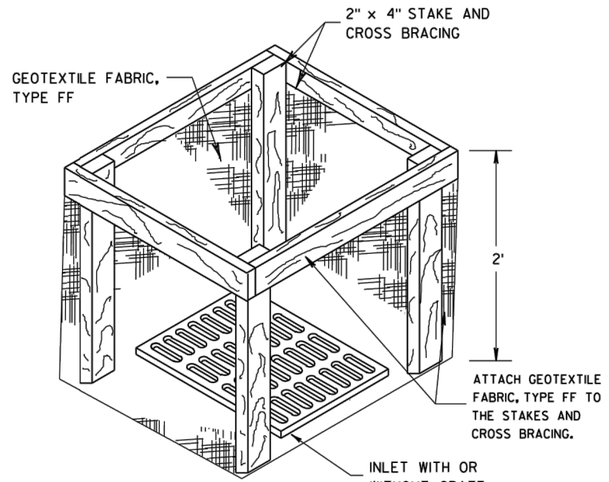
REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

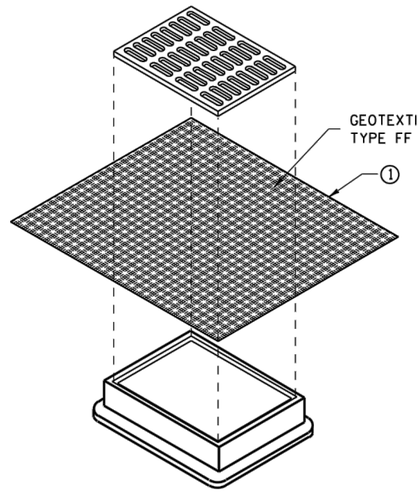
PAGE NO. C406

SDD 8e10 Inlet Protection Type A, B, C and D

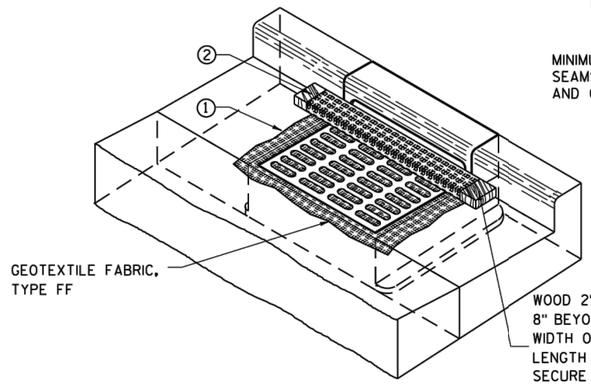




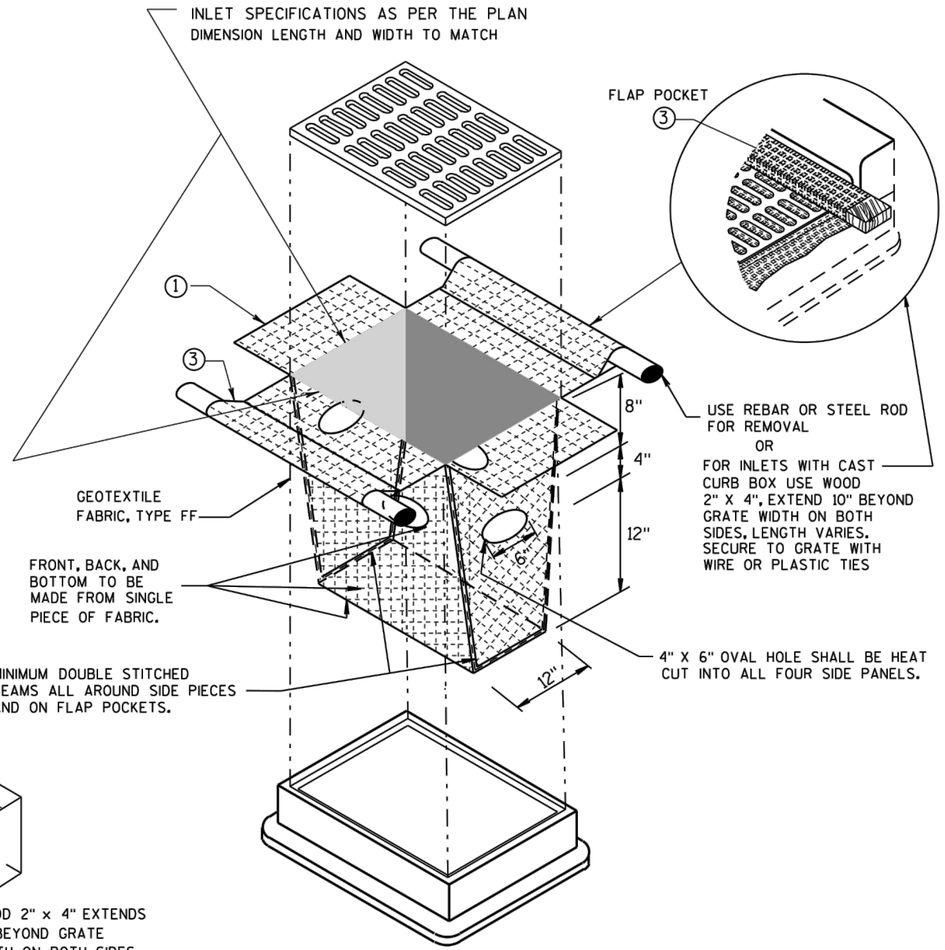
INLET PROTECTION, TYPE A



INLET PROTECTION, TYPE B
(WITHOUT CURB BOX)
(CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)



INLET PROTECTION, TYPE D
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

TYPE C INLET EQUALS CITY OF DE PERE TYPE B INLET

STANDARD DETAIL MODIFIED

GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.

② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.

③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.

INSTALLATION NOTES

TYPE B & C

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D

DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.

INLET PROTECTION
TYPE A, B, C, AND D

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
10-16-02 — DATE
/S/ Beth Cannestra — CHIEF ROADWAY DEVELOPMENT ENGINEER
FHWA

6

S.D.D. 8 E 10-2

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S.D.D. 8 E 10-2

DE PERE
CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
CONSTRUCTION DETAILS

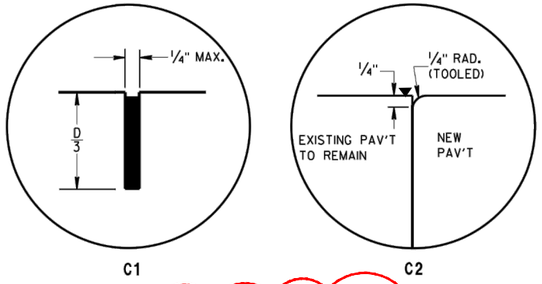
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
SURVEYED		
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	CKK	03-2019

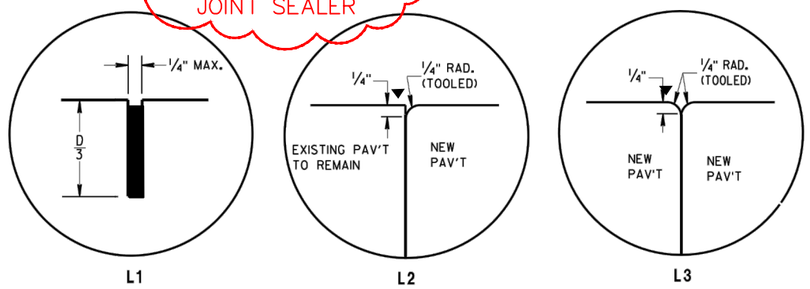
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. C501

SDD 13c9-b Concrete Pavement Repair and Replacement



TRANSVERSE JOINTS
HOT POURED ELASTIC JOINT SEALER



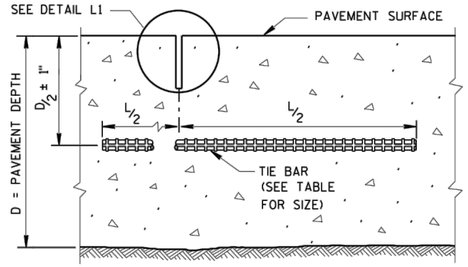
LONGITUDINAL JOINTS
HOT POURED ELASTIC JOINT SEALER

TIE BAR TABLE

PAVEMENT DEPTH (D)	TIE BAR SIZE	TIE BAR LENGTH (L)	MAX. TIE BAR SPACING
< 10 1/2"	NO. 4	30"	36"
≥ 10 1/2"	NO. 5	36"	36"
	NO. 4 *	30"	24" **

* SUBSTITUTE BENT BARS AT LONGITUDINAL JOINTS WHEN EQUIPMENT LIMITATIONS DURING CONSTRUCTION WARRANT (e.g. AUXILIARY LANES OR TURN LANES)

** CONFORM TO 15" MINUMUM SPACING FROM TRANSVERSE JOINTS; SPACING BETWEEN TIE BARS WILL BE 30" AT TRANSVERSE JOINTS.



SECTION C-C
SAWED LONGITUDINAL JOINT

GENERAL NOTES

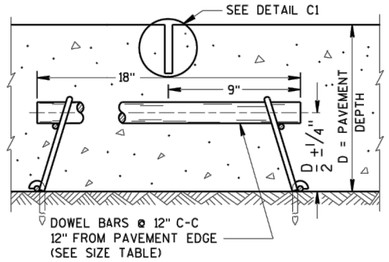
INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

CONCRETE PAVEMENT REPAIRS OF EXISTING NONDOWELED CONCRETE PAVEMENTS DO NOT NEED TO BE DOWELED.

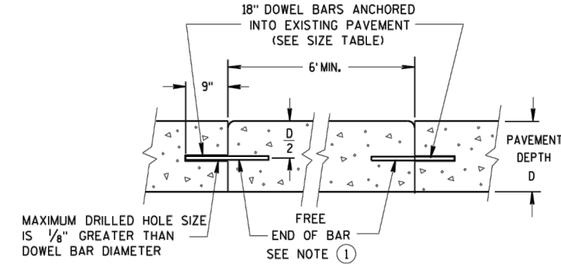
ANCHOR DOWEL BARS AND TIE BARS INTO DRILLED HOLES WITH AN EPOXY.

FOR MULTI-LANE CONCRETE PAVEMENT REPLACEMENTS, PROVIDE A MINIMUM DISTANCE OF 15 INCHES FROM ALL TRANSVERSE JOINTS OR EDGES OF REPLACEMENT TO THE CENTER OF THE TIE BAR NEAREST THAT JOINT OR EDGE.

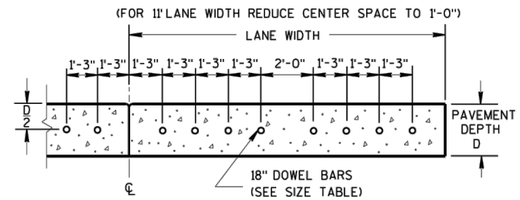
(1) APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.



SECTION F-F
CONTRACTION JOINT



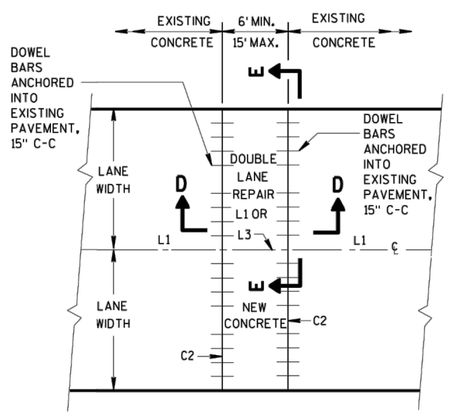
SECTION D-D



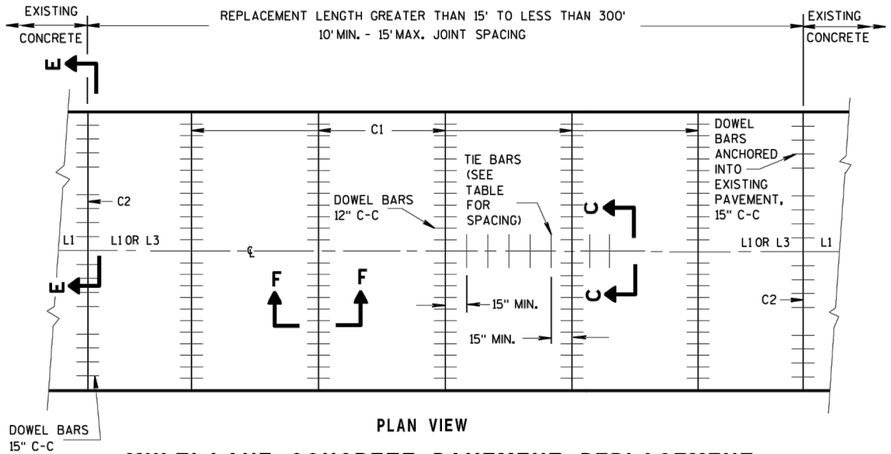
SECTION E-E
DRILLED DOWEL BAR CONSTRUCTION JOINT

PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	DRILLED DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 1/2", 6", 6 1/2"	NONE	NONE	12'
7", 7 1/2"	1"	1"	14'
8", 8 1/2"	1 1/4"	1 1/4"	15'
9", 9 1/2"	1 1/4"	1 1/4"	15'
10" & ABOVE	1 1/2"	1 1/4"	15'



PLAN VIEW
MULTI-LANE CONCRETE PAVEMENT REPAIR



PLAN VIEW
MULTI-LANE CONCRETE PAVEMENT REPLACEMENT

STANDARD DETAIL MODIFIED

CONCRETE PAVEMENT REPAIR AND REPLACEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

S.D.D. 13 C 9-15b

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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
CONSTRUCTION DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
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DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
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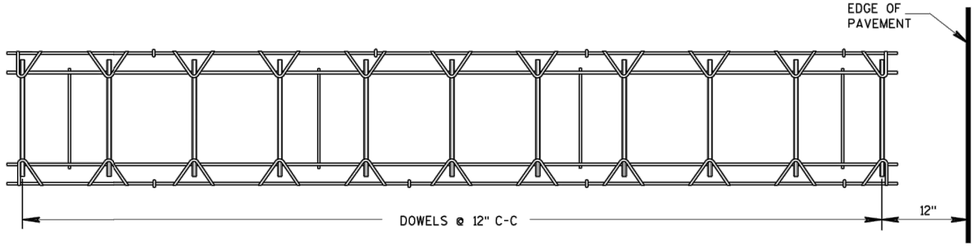
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. C502

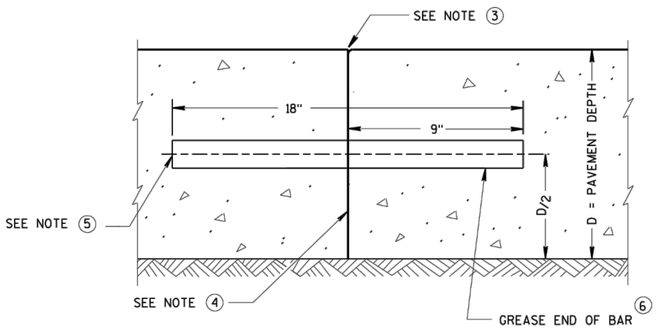
SDD 13c13 Urban Doweled Concrete Pavement



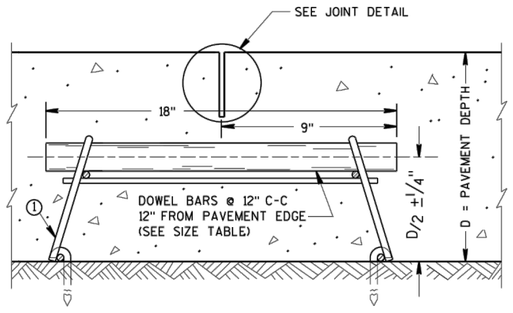
PLAN VIEW

SIDE VIEW

CONTRACTION JOINT DOWEL ASSEMBLY ①



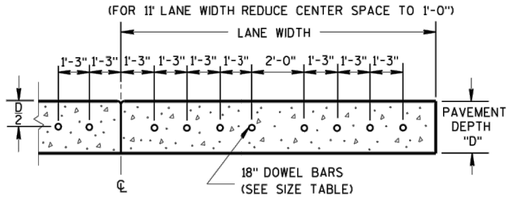
TRANSVERSE CONSTRUCTION JOINT



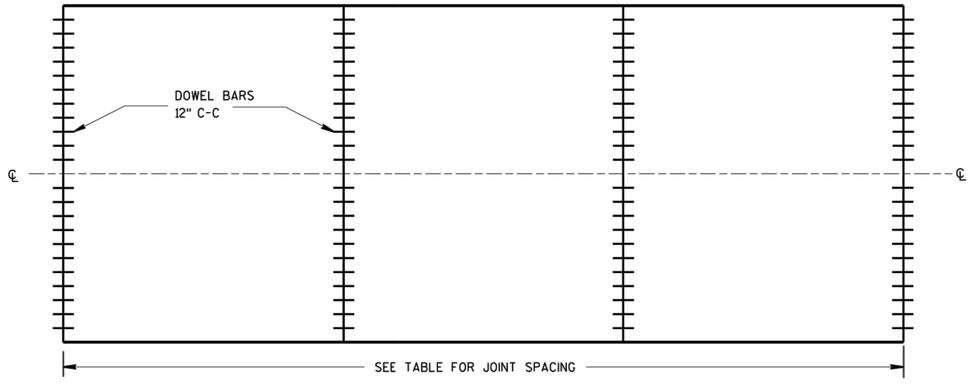
DOWELED CONTRACTION JOINT

PAVEMENT DEPTH, DOWEL BAR SIZE AND JOINT SPACING TABLE

PAVEMENT DEPTH (D)	DOWEL BAR DIAMETER	CONTRACTION JOINT SPACING
5 ½",6",6 ½"	NONE	12'
7",7 ½"	1"	14'
8",8 ½"	1 ¼"	15'
9",9 ½"	1 ¼"	15'
10" & ABOVE	1 ½"	15'



DRILLED DOWEL BAR CONSTRUCTION JOINT ⑦



CONTRACTION JOINT LOCATIONS

GENERAL NOTES

CONTRACTION JOINTS

CONSTRUCT TRANSVERSE CONTRACTION JOINTS NORMAL TO THE CENTERLINE. SHOW THE LOCATION OF CONTRACTION JOINTS THROUGH INTERSECTIONS ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

INSTALL DOWEL BARS PARALLEL TO THE PAVEMENT CENTERLINE AND PAVEMENT SURFACE.

FOR PAVEMENT SLABS OF VARYING WIDTHS, LOCATE THE OUTER MOST DOWEL BAR SO THAT THE CENTER OF THE BAR IS A MINIMUM OF 6 INCHES AND A MAXIMUM OF 18 INCHES FROM THE LONGITUDINAL JOINT AND THE FREE EDGE OF PAVEMENT.

CONSTRUCTION JOINTS

LOCATE CONSTRUCTION JOINTS A MINIMUM OF 6 FEET FROM THE NEAREST CONTRACTION JOINT AND ALIGN PARALLEL TO CONTRACTION JOINTS.

① OBTAIN THE ENGINEER'S APPROVAL FOR THE USE OF ALTERNATIVE DESIGNS OF THE DOWEL ASSEMBLY. USE MECHANICAL DOWEL BAR INSERTERS OR DOWEL ASSEMBLIES WHEN CONSTRUCTING CONTRACTION JOINTS.

② SECURE BASKETS WITH ANCHORS TO HOLD DOWEL BARS IN THE CORRECT POSITION AND ALIGNMENT. TYPE, LOCATION, NUMBER AND LENGTH OF ANCHORS ARE DEPENDENT UPON FIELD CONDITIONS.

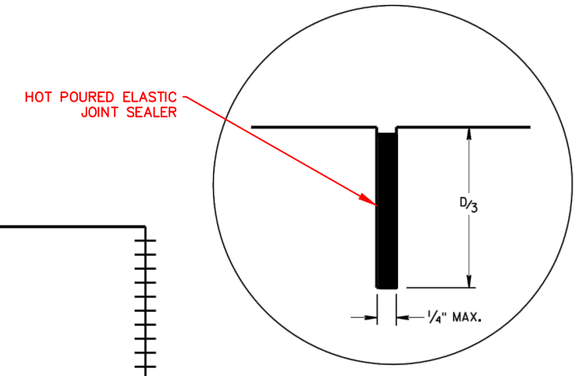
③ FORM OR SAW CONSTRUCTION JOINTS. PROVIDE A ¼-INCH RADIUS AT FORMED JOINTS.

④ PROVIDE A SMOOTH VERTICAL FACE FOR THE ENTIRE DEPTH OF THE PAVEMENT WHEN FORMING CONSTRUCTION JOINTS.

⑤ INSTALL DOWEL BARS AT CONSTRUCTION JOINTS BY FORMING OR DRILLING. INSTALL FORMED DOWEL BARS 12 INCHES C-C AND 12 INCHES FROM PAVEMENT EDGE. REMOVE EXCESS CONCRETE FROM THE FREE END OF THE DOWEL BAR IF DOWEL BARS ARE FORMED THROUGH A HEADER BOARD. INSTALL DRILLED DOWEL BARS ACCORDING TO *DRILLED DOWEL BAR CONSTRUCTION JOINT* DETAIL.

⑥ APPLY A THIN UNIFORM COATING OF SURFACE TREATMENT TO THE FREE END OF DOWEL BARS TO PREVENT BONDING.

⑦ ANCHOR DOWEL BARS INTO DRILLED HOLES WITH AN EPOXY. MAXIMUM DRILLED HOLE SIZE IS ⅛-INCH GREATER THAN DOWEL BAR DIAMETER. 9 INCHES IN LENGTH.



JOINT DETAIL

STANDARD DETAIL MODIFIED

URBAN DOWELED CONCRETE PAVEMENT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March 2018 — DATE
/S/ Peter Kemp, P.E. — PAVEMENT SUPERVISOR
FHWA

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S.D.D. 13 C 13-9

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S.D.D. 13 C 13-9

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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
CONSTRUCTION DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
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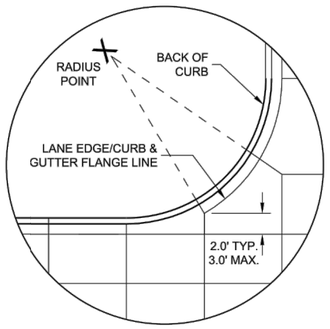
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	OKK	03-2019

REVISIONS / ISSUES

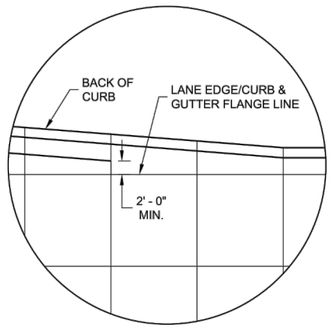
NO.	DATE	BY	REMARKS

PAGE NO. C503

SDD 13c18-a Concrete Pavement Jointing



DETAIL "A"



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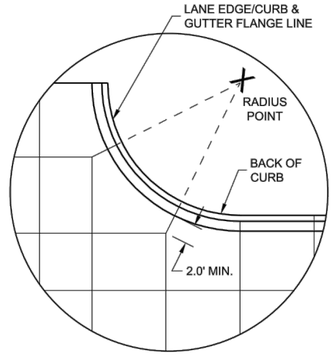

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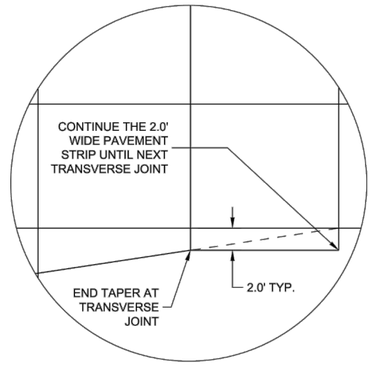


DETAIL "D"

GENERAL NOTES

THE PRIMARY ROADWAY CONTROLS THE TRANSVERSE JOINT PATTERN.

ALIGN NEW JOINTS WITH EXISTING JOINTS OR CRACKS.

CONSTRUCT TRANSVERSE JOINTS PERPENDICULAR TO THE ROADWAY.

ADJUST TRANSVERSE JOINTS TO ALIGN WITH UTILITY FIXTURES (E.G MANHOLES AND INLETS) IN THE PAVEMENT STRUCTURE WHEN POSSIBLE. WATER VALVES DO NOT REQUIRE JOINT ADJUSTMENT.

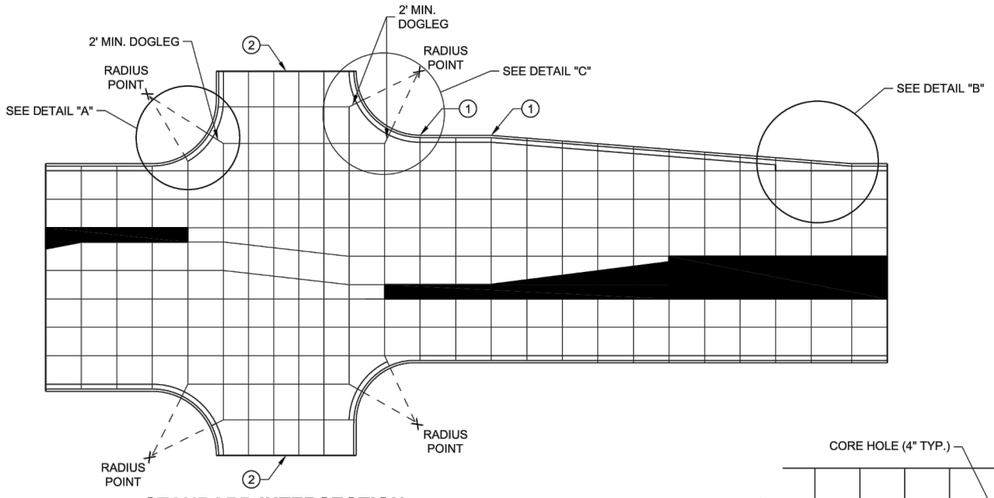
AVOID SLABS LESS THAN 2 FEET WIDE OR GREATER THAN 15 FEET WIDE.

SEE TABLE FOR TRANSVERSE JOINT SPACING. JOINT SPACING SPECIFIED IS MAXIMUM AND ACTUAL SPACING CAN BE ADJUSTED TO ACCOMMODATE INTERSECTIONS.

AVOID ANGLES LESS THAN 60° BY DOGLEGGING JOINTS THROUGH CURVE RADIUS POINTS. USE 90° ANGLES WHEN POSSIBLE.

CORRELATE LONGITUDINAL JOINTS WITH LANE LINES WHEN POSSIBLE.

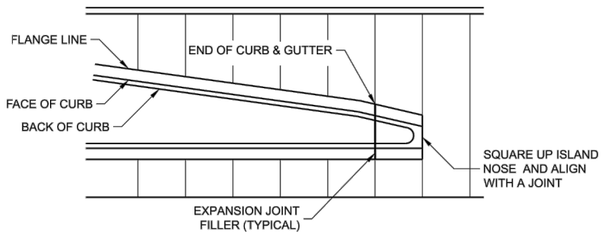
1. PROVIDE TRANSVERSE JOINTS AT ALL PAVEMENT WIDTH CHANGES.
2. CONSTRUCT DOWELED EXPANSION JOINT ON THE SIDE ROAD OF AN INTERSECTION IF THE SIDE ROAD IS CONCRETE PAVEMENT AND GREATER THAN 300 FEET IN LENGTH. ALIGN EXPANSION JOINT WITHEDGE OF RADIUS.
3. THE ENGINEER MAY APPROVE SLIGHT VARIATIONS FROM THESE JOINTING DETAILS.



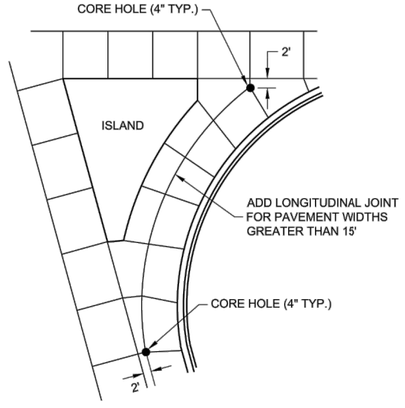
STANDARD INTERSECTION

PAVEMENT DEPTH AND JOINT SPACING TABLE

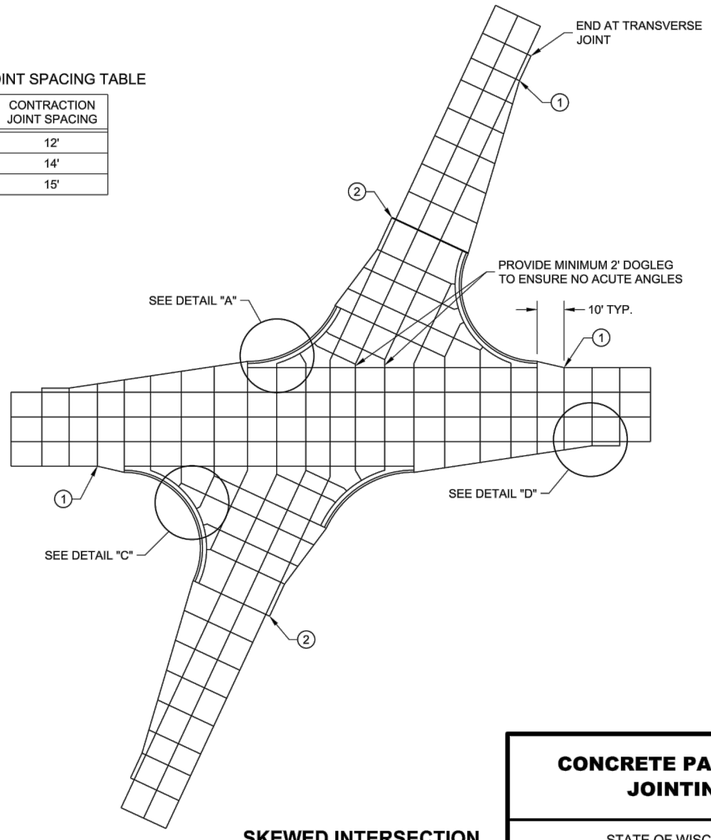
PAVEMENT DEPTH (D)	CONTRACTION JOINT SPACING
6", 6 ½"	12'
7", 7 ½"	14'
8" & ABOVE	15'



APPROACH TO MEDIAN



LARGE RIGHT TURN



SKEWED INTERSECTION

CONCRETE PAVEMENT JOINTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

DE PERE
CITY OF DE PERE
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ENTERPRISE DRIVE & PROSPER STREET
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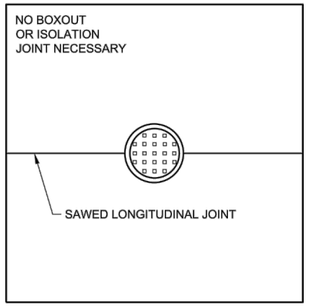
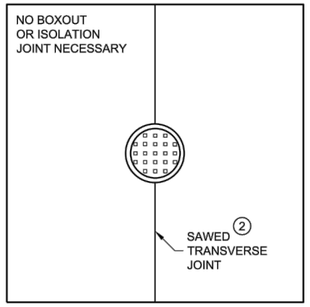
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. C504

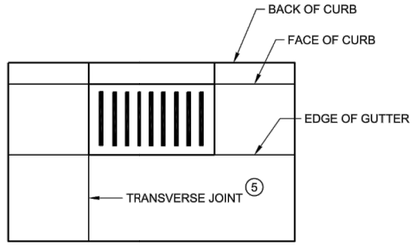
SDD 13c18-d Concrete Pavement Jointing at Utility Fixtures



MANHOLE WITH LONGITUDINAL JOINT



MANHOLE WITH TRANSVERSE JOINT



INLET WITH TRANSVERSE JOINT

GENERAL NOTES

1. USE BOXOUTS WHEN UTILITY STRUCTURE IS IN THE PATH OF CONSTRUCTION JOINTS. PROVIDE A 1 FOOT MINIMUM CLEARANCE BETWEEN THE EXTERIOR LIMIT OF THE STRUCTURE TO THE DIAMOND BOXOUT.
2. ADJUST TRANSVERSE JOINT TO INTERSECT MANHOLE IF POSSIBLE.
3. IF DISTANCE BETWEEN THE LONGITUDINAL JOINT AND THE EDGE OF MANHOLE IS 2 FEET OR LESS, DIVERT THE LONGITUDINAL JOINT AT A 2:1 TAPER RATE TO THE CENTER OF THE MANHOLE. IF THE DISTANCE IS GREATER THAN 2 FEET, DO NOT DIVERT THE JOINT AND SAW AS NORMAL. PLACE REINFORCEMENT REBAR AROUND THE MANHOLE.
4. IF THE DISTANCE FROM THE EDGE OF THE MANHOLE TO THE NEAREST TRANSVERSE JOINT IS LESS 4 FEET OR LESS, REDIRECT JOINT TO INTERSECT THE CENTER OF THE MANHOLE. IF DISTANCE IS GREATER THAN 4 FEET, DO NOT DIVERT THE JOINT AND SAW AS NORMAL. PLACE REINFORCEMENT REBAR AROUND THE MANHOLE.
5. ALIGN TRANSVERSE JOINT WITH ONE EDGE OF INLET WHEN PRACTICAL.

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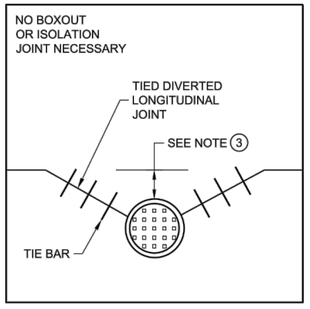
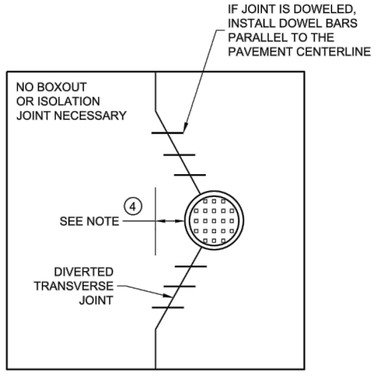
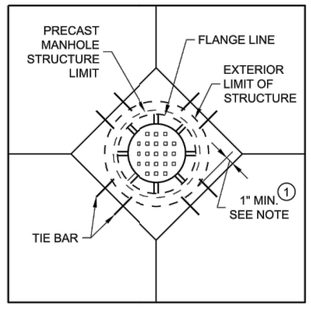


MANHOLE WITH DIVERTED LONGITUDINAL CONTRACTION JOINT



MANHOLE WITH DIVERTED TRANSVERSE CONTRACTION JOINT



DIAGONAL MANHOLE BOXOUT FOR CONSTRUCTION JOINTS

6

CONCRETE PAVEMENT JOINTING AT UTILITY FIXTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 — DATE
/S/ Peter Kemp P.E. — PAVEMENT SUPERVISOR
FHWA

DE PERE

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

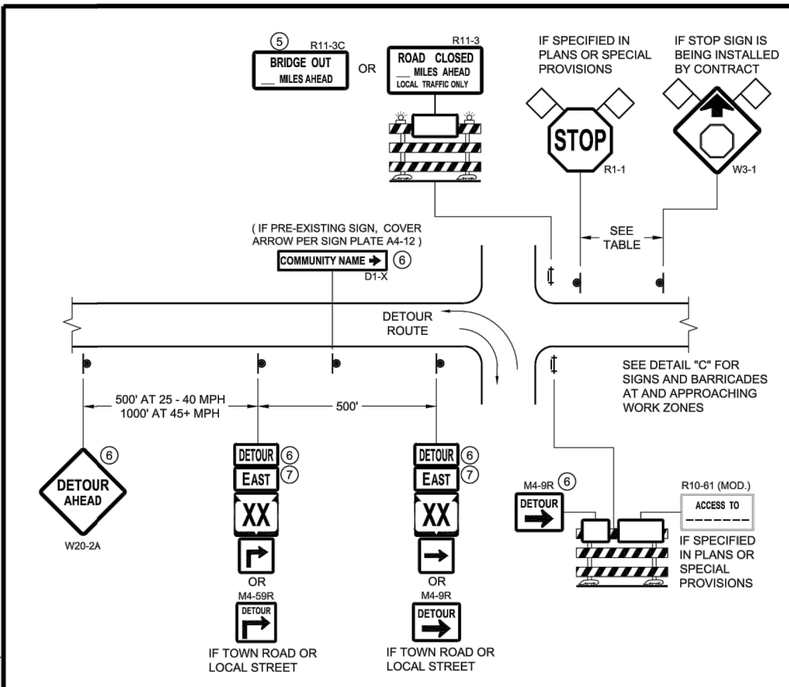
ENTERPRISE DRIVE & PROSPER STREET
CONSTRUCTION DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

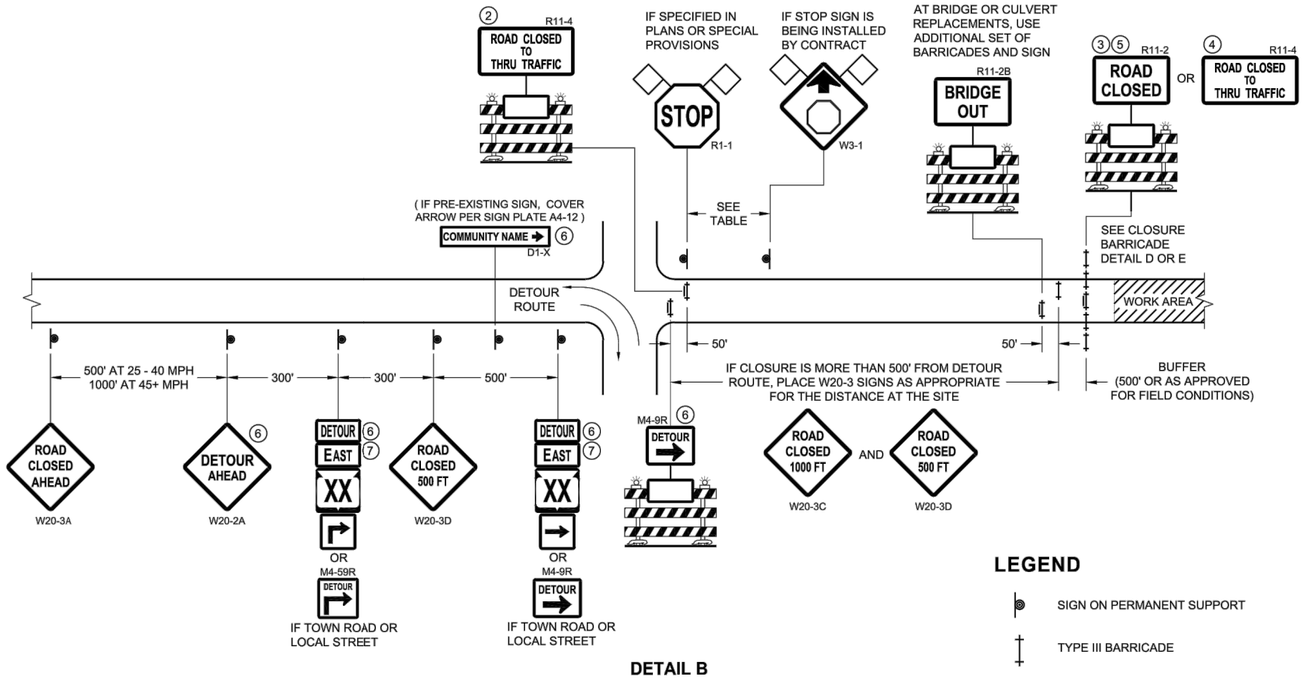
	BY	DATE
SURVEYED		
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	CKK	03-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

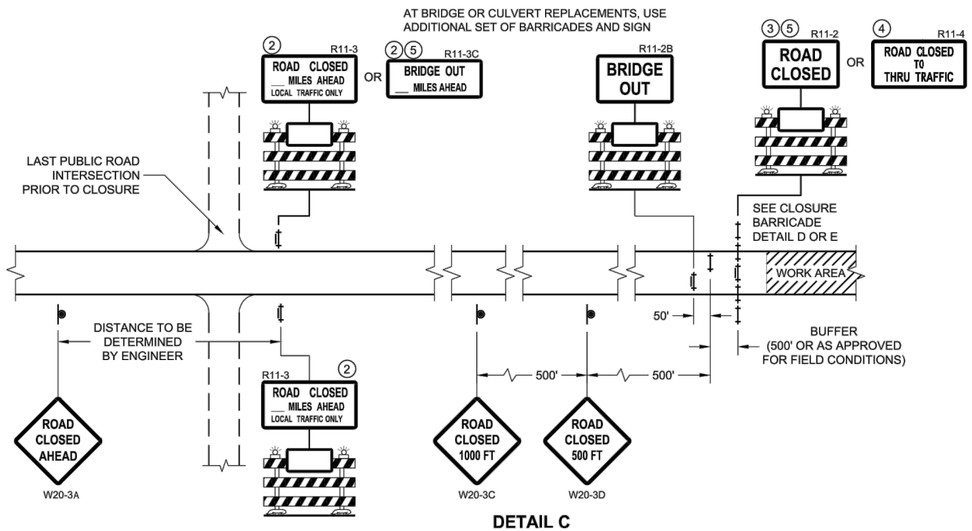
SDD 15c2-a Barricades and Signs for Mainline Closures



DETAIL A
MAINLINE CLOSURE WITH POSTED DETOUR
WORK ZONE GREATER LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL B
MAINLINE CLOSURE WITH POSTED DETOUR
WORK ZONE LESS THAN ½ MILE FROM DETOUR ROUTE (1000 FEET IF URBAN)



DETAIL C
MAINLINE CLOSURE, NO POSTED DETOUR

SPEED LIMIT (MPH)	"STOP AHEAD" ADVANCE WARNING DISTANCE (FT)
25	200
30	200
35	350
40	350
45	500
50	550
55	750

SEE SDD 15C2-SHEET "b"
FOR GENERAL NOTES
AND FOOTNOTES ① THROUGH ⑦

LEGEND

- SIGN ON PERMANENT SUPPORT
- TYPE III BARRICADE
- TYPE III BARRICADE WITH ATTACHED SIGN
- TYPE "A" WARNING LIGHT (FLASHING)
- WORK AREA
- FLAGS, 16" X 16" MIN. (ORANGE)

DETOUR M4 - 8
EAST M3 - X
XX M1 - 4 OR XX M1 - 6 OR COUNTY X M1 - 5A
M05 - 1 OR M06 - 1

BARRICADES AND SIGNS FOR MAINLINE CLOSURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 — DATE
/S/ Andrew Heidtke — WORK ZONE ENGINEER
FHWA

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
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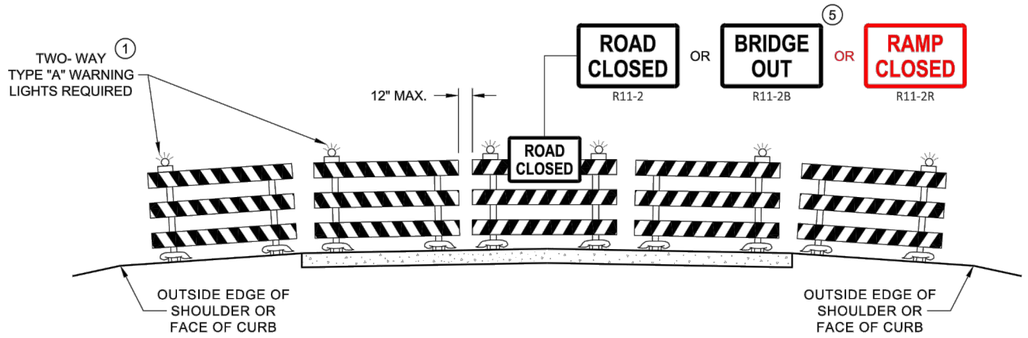
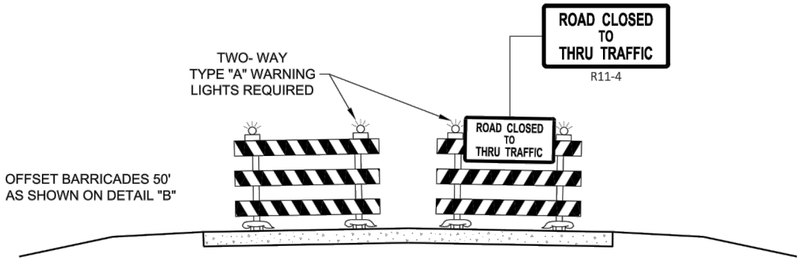
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

SDD 15c2-b Barricades and Signs for Various Mainline Closures



DETAIL D
ROAD CLOSURE BARRICADE DETAIL
APPROACH VIEW



DETAIL E
LANE CLOSURE BARRICADE DETAIL
APPROACH VIEW

SEE SDD 15C2 - SHEET "a" FOR LEGEND

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRICADES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH TRAFFIC CONTROL "IN USE", SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A DESIRABLE MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY RE-ESTABLISHED UPON COMPLETION OF THE OPERATION, OR FOR CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLBLE SUPPORTS.

ALL TYPE III BARRICADES SHALL HAVE RAILS REFLECTORIZED ON BOTH FACES. STRIPES SHALL BE PROPERLY SLOPED DOWN TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRICADE DETAIL "D" FOR FULL ROAD CLOSURES.

TYPE "A" LOW - INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRICADE.

THE R11 - 2, R11 - 3, M4 - 9, R11 - 4, AND R10 - 61 SIGNS PLACED ON THE BARRICADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE RAIL OR BOTTOM RAILS.

"WO" AND "MO" SIGNS ARE THE SAME AS "W" AND "M" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

ALL SIGNS SHALL BE 48" X 48" UNLESS OTHERWISE NOTED BELOW:
- R11 - 2 SHALL BE 48" X 30"
- R11 - 3 SHALL, R11 - 4 AND R10 - 61 SHALL BE 60 " X 30"
- M4 - 9 SHALL BE 30" X 24"
- M3 - X SHALL BE 24" X 12" (36" X 18" IF NEEDED TO MATCH EXISTING SIGNS)
- M4 - 8 SHALL BE 24" X 12" (36" X 15" IF NEEDED TO MATCH EXISTING SIGNS)
- M1 - 4, M1 - 5A AND M1 - 6 SHALL BE 24" X 24" (36" X 36" IF NEEDED TO MATCH EXISTING SIGNS)
- MO5 - 1 AND MO6 - 1 SHALL BE 21" X 21" (30" X 30" IF NEEDED TO MATCH EXISTING SIGNS)
- D1 - X SHALL BE AS SHOWN ON SPECIFIC PROJECT SIGNING DETAIL SHEETS.
- R1 - 1 SHALL BE 36" X 36"

(1) TWO WARNING LIGHTS SHALL BE PROVIDED ON THE CENTER BARRICADE AND A MINIMUM OF ONE WARNING LIGHT SHALL BE PROVIDED ON EACH OF THE OTHER BARRICADES WITHIN THE ROADWAY LIMITS. SPACING OF THE WARNING LIGHTS SHALL BE UNIFORM TO THE EDGE OF ROADWAY AS SHOWN (APPROX. 8 FOOT LIGHT SPACING.

(2) THESE SIGNS AND BARRICADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT AN INTERSECTION.

(3) FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "D".

(4) FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRICADE DETAIL "E".

(5) FOR BRIDGE OR CULVERT REPLACEMENTS, SUBSTITUTE "BRIDGE OUT" INSTEAD OF "ROAD CLOSED" ON R11 - 2 AND R11 - 3 SIGNS.

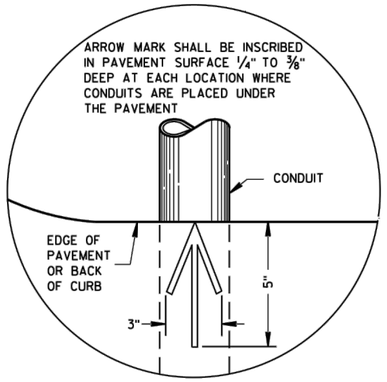
(6) INSTALL DETOUR AND COMMUNITY GUIDE SIGNS AND ARROWS ONLY IF SPECIFIED IN THE CONTRACT. IF THERE ARE EXISTING ROUTE MARKER ASSEMBLIES THAT WILL REMAIN IN PLACE, ADJUST THE LOCATION OF THE DETOUR ROUTE SIGNS TO CORRESPOND WITH THE EXISTING ASSEMBLIES. MODIFY EXISTING SIGNS WHERE POSSIBLE. SEE SPECIFIC PROJECT DETOUR SIGNING DETAIL SHEETS. IF DETOUR SIGNS ARE BEING INSTALLED BY OTHERS, PLACE THE CONTRACTED TRAFFIC CONTROL SIGNS TO ALLOW FOR PLACEMENT OF ALL WARNING, DETOUR AND GUIDE SIGNS AS SHOWN.

(7) "EAST" CARDINAL DIRECTION MARKERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDIANAL DIRECTIONS AND ARROWS AS APPROPRIATE.

BARRICADES AND SIGNS FOR VARIOUS CLOSURES

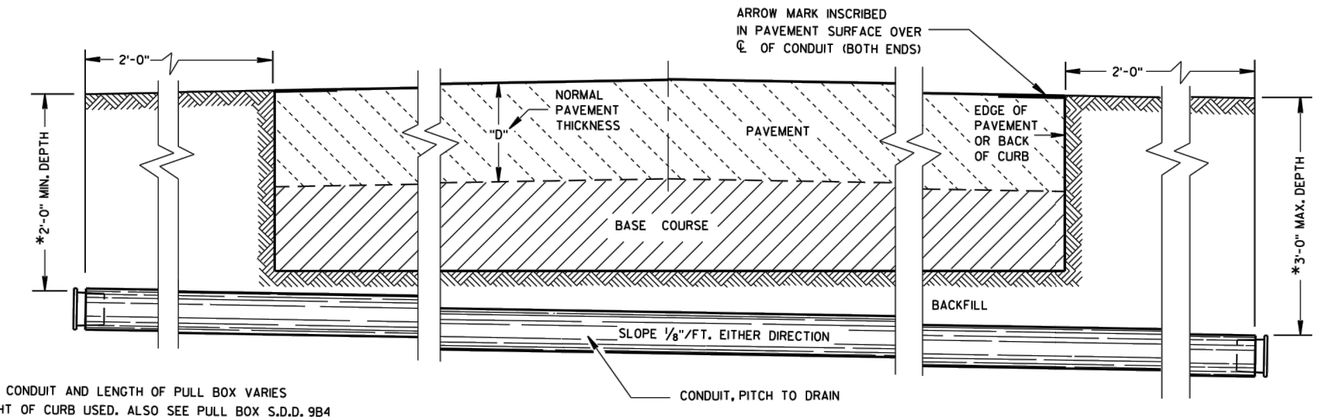
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 — DATE
/S/ Andrew Heidtke — WORK ZONE ENGINEER
FHWA



PLAN VIEW

ARROW MARK



*DEPTH OF CONDUIT AND LENGTH OF PULL BOX VARIES WITH HEIGHT OF CURB USED. ALSO SEE PULL BOX S.D.D. 9B4

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 652.2.2) OR NONMETALLIC (STANDARD SPECIFICATION 652.2.3) 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 EMERSION 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 U.L. 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 U.L. 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.

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.

6

S.D.D. 9 B 2-10

6

S.D.D. 9 B 2-10

CONDUIT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
March, 2017 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

TABLE OF NOMINAL DIMENSIONS AND WEIGHTS

DIMENSION IN INCHES		CORRUGATED STEEL PIPE								
PIPE DIAMETER (INSIDE)	A	12	12	12	18	18	18	24	24	24
PIPE LENGTH **	B	24	30	36	24	30	36	36	42	48
WALL THICKNESS	C	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
COVER	D	10 1/4	10 1/4	10 1/4	16 1/4	16 1/4	16 1/4	22 1/4	22 1/4	22 1/4
FRAME	E	14 1/2	14 1/2	14 1/2	20 1/2	20 1/2	20 1/2	26 1/2	26 1/2	26 1/2
FRAME	F	8 1/2	8 1/2	8 1/2	14 1/2	14 1/2	14 1/2	20 1/2	20 1/2	20 1/2
FRAME	G	11 1/2	11 1/2	11 1/2	17 1/2	17 1/2	17 1/2	23 1/2	23 1/2	23 1/2
WEIGHT IN POUNDS *										
FRAME AND COVER		60	60	60	110	110	110	155	155	155

* THE ACTUAL WEIGHT OF THE MANHOLE FRAME AND COVER MAY VARY WITHIN 5 PERCENT PLUS OR MINUS OF THE WEIGHTS SHOWN.

** NORMALLY USED LENGTHS. THE PROJECT ENGINEER SHALL DETERMINE IF PIPE LENGTHS, OTHER THAN THOSE SPECIFIED, SHALL BE USED, TO A MAXIMUM OF 48" (CONTINUOUS LENGTH, NON-SPLICED). THE ADDITIONAL LENGTH SHALL BE INCIDENTAL TO THE PULL BOX BID PRICE.

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

ALL FRAMES AND COVERS SHALL BE HEAVY DUTY TYPE, SUITABLE FOR VEHICULAR TRAFFIC LOADS.

PULL BOXES LOCATED IN THE ROADWAYS SHALL HAVE LOCKING COVERS.

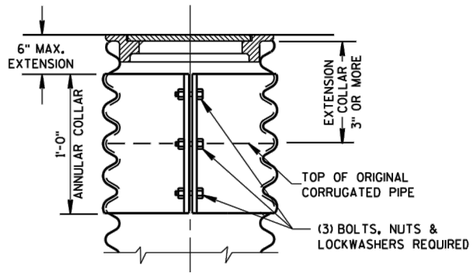
ENTRANCE HOLES INTO PULL BOXES SHALL BE CUT WITH A CIRCULAR HOLE SAW OR HYDRAULIC CONDUIT PUNCH. HOLE SIZE SHALL BE THE OUTSIDE DIAMETER OF THE CONDUIT THAT IS TO FIT IN THE OPENING PLUS NO MORE THAN 1/4".

THE CONTRACTOR SHALL NOT INSTALL WIRE IN ANY PULL BOX UNTIL ITS INSTALLATION HAS BEEN INSPECTED AND ACCEPTED BY THE ENGINEER.

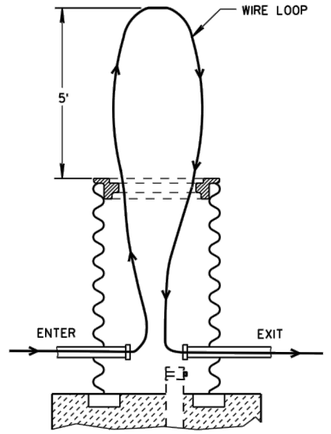
GROUNDING LUGS (MECHANICAL CONNECTORS) SHALL BE U.L. LISTED AND APPROVED FOR USE WITH COPPER WIRE.

ALL METALLIC CONDUIT IN WHICH WIRE AND/OR CABLE IS TO BE INSTALLED, SHALL BE BUSHED BEFORE INSTALLATION OF THE WIRE AND/OR CABLE.

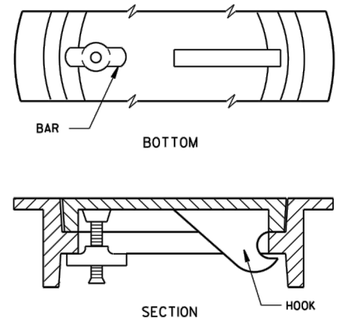
WHEN PULL BOXES ARE INSTALLED FOR FUTURE USE, DO NOT INSTALL THE EQUIPMENT GROUNDING LUG. THE EQUIPMENT GROUNDING LUG, THE EQUIPMENT GROUNDING ELECTRODE AND THE EQUIPMENT GROUNDING CONDUCTOR SHALL BE REQUIRED AND INSTALLED UNDER A FUTURE WIRING CONTRACT.



CORRUGATED PIPE EXTENDER

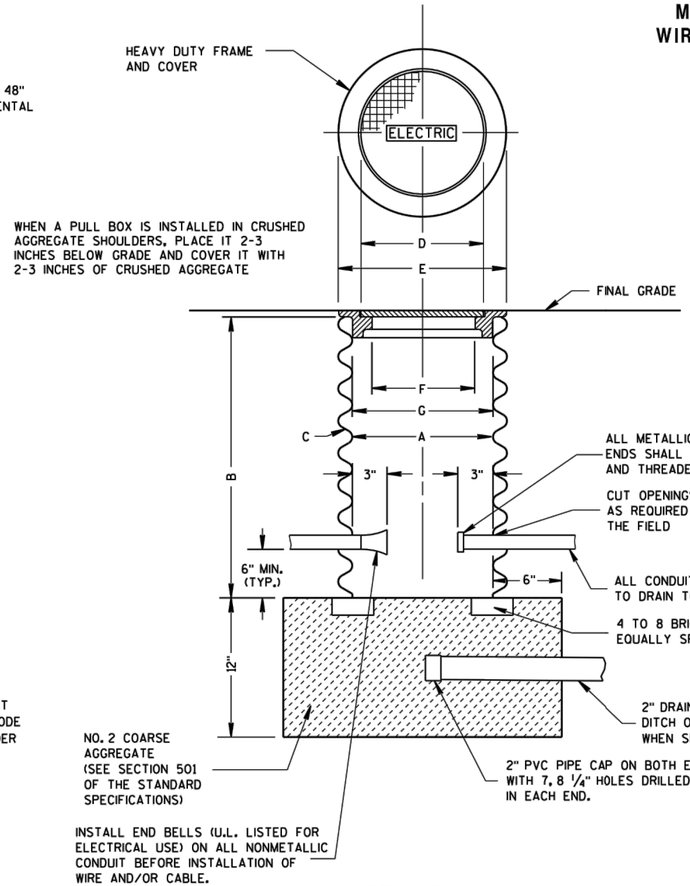


MEASUREMENT DETAIL FOR WIRE/CABLE IN THE PULL BOX

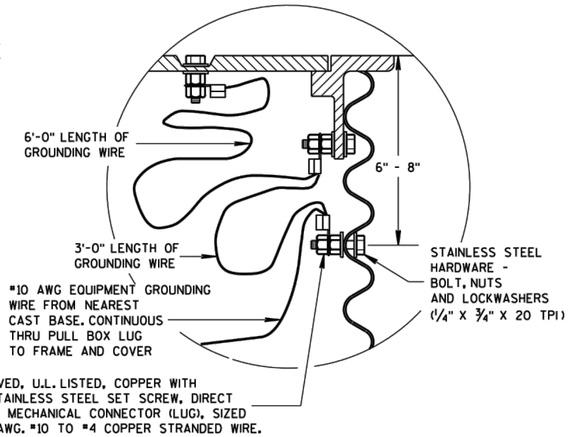


ALTERNATE COVER (LOCKING)

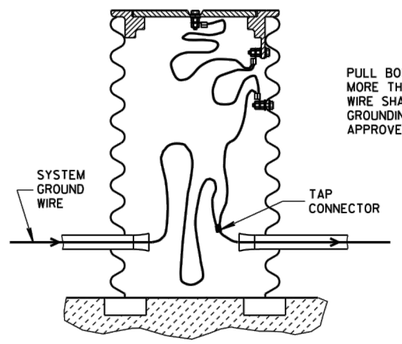
TIGHTENING BAR TYPE



PULL BOX



EQUIPMENT GROUNDING LUG AND LOCATION IN STEEL PULL BOXES



EQUIPMENT GROUNDING LUG AND LOCATION IN STEEL PULL BOXES

PULL BOX

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept. 2014 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

6

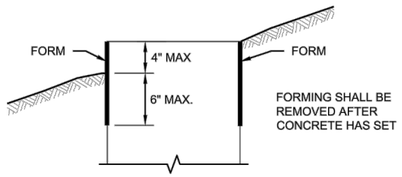
S.D.D. 9 B 4-11

6

S.D.D. 9 B 4-11

SDD 9c2 Concrete Bases Types 1, 2, 5 and 6

FORM DEPTH SHALL BE NO MORE THAN 6" BELOW GRADE ON THE LOWER SIDE OF BASE



FORMING DETAIL

QUANTITY REQUIREMENTS	CONCRETE BASE TYPE		
	1	2	5 & 6
APPROX. CUBIC YARDS OF CONCRETE	0.40	0.57	0.40
LBS. OF HOOP BAR STEEL	NONE	23	16
LBS. OF VERTICAL BAR STEEL	NONE	60	18

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWINGSHALL 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 CABLING USE. THE EXIT STUB SHALL BE SIZED AS USED THROUGHOUT THE CONDUIT RUN AS SHOWN A THE ENTRANCE OF THE BASE.

ENDS OF CONDUIT INSTALLED BELOW GRADE FRO FUTURE USE SHALL BE CAPPED IF METALLIC OR PLUGGED IF NON-METALLIC.

MINIMUM BENDING RADIUS OF CONDUIT IS EQUAL TO 6X 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 BENDS 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, U.L. 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 1, 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 654.2.1 OF THE STANDARD SPECIFICATIONS.

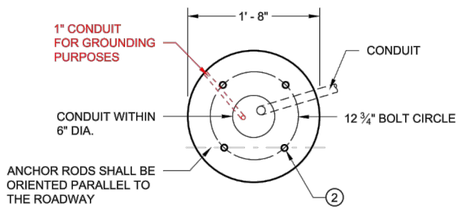
WASHERS AND LOCK WASHERS ARE REQUIRED ON ALL ANCHOR RODS.

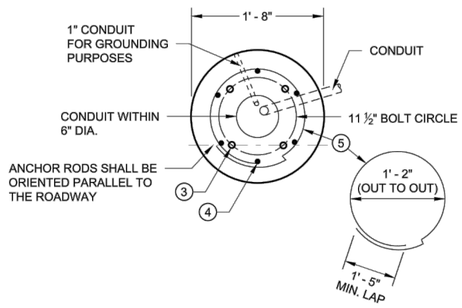
WHEN ANCHOR RODS USING THE ALTERNATE "L" BEND ARE FURNISHED, THE 4 INCH"L" BEND SHALL BE IN ADDITION TO THE SPECIFIED ANCHOR ROD BAR LENGTH. THE "L" BEND SHALL NOT BE THREADED.

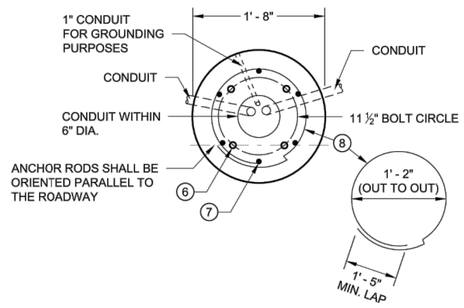
ANCHOR RODS SHALL BE INSTALLED WITH MISALIGNMENTS OF LESS THAN 1:40 FROM VERTICAL.

WELDING OF THE ANCHOR RODS TO THE CAGE IS UNACCEPTABLE. TIE 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).

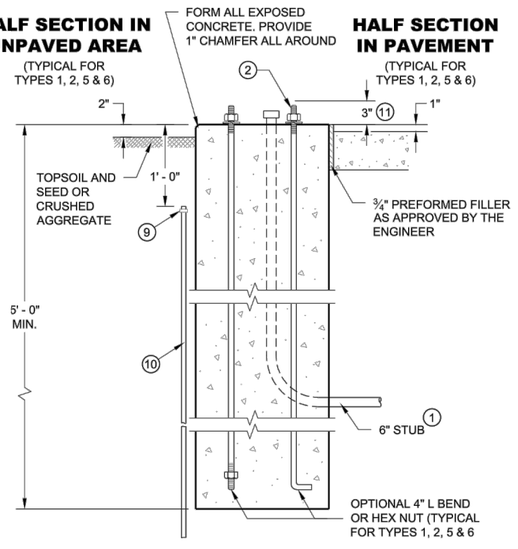




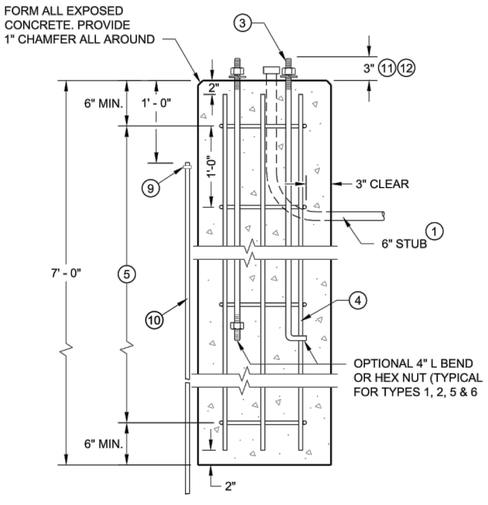


HALF SECTION IN UNPAVED AREA
(TYPICAL FOR TYPES 1, 2, 5 & 6)

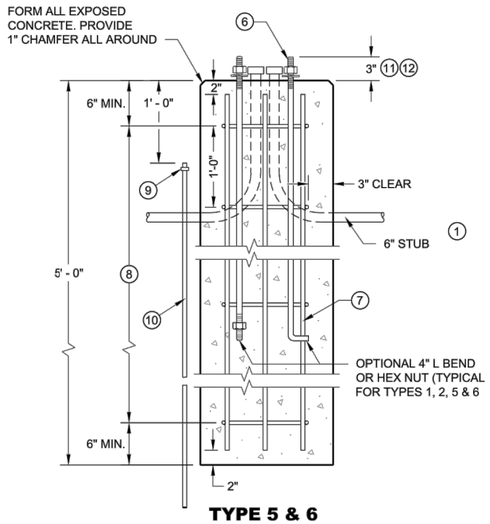
HALF SECTION IN PAVEMENT
(TYPICAL FOR TYPES 1, 2, 5 & 6)



TYPE 1



TYPE 2



TYPE 5 & 6

CONCRETE BASES

1 THE MINIMUM DEPTH OF CONDUIT EXITING THE CONCRETE BASE AND INSTALLED BELOW THE TRAVELED WAY SHALL BE 24 INCHES. THE MINIMUM DEPTH OF CONDUIT EXITING 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) 1" DIA. X 3' - 6" ANCHOR RODS.

3 (4) 1" DIA. X 5' - 0" ANCHOR RODS.

4 (6) NO. 6 X 6' - 8" BAR STEEL REINFORCEMENT.

5 (7) NO. 4 X 5' - 1" BAR STEEL REINFORCEMENT @ 1' - 0" C - C.

6 (4) 1" DIA. X 3' - 6" ANCHOR RODS.

7 (6) NO. 4 X 4' - 8" BAR STEEL REINFORCEMENT.

8 (5) NO. 4 X 5' - 1" BAR STELL REINFORCEMENT @ 1' - 0" C -C.

9 EXOTHERMIC CONNECTION TO EUIPMENT GROUNDING CONDUCTOR

10 ⅝" DIA. X 8' -0" COPPERCLAD EQUIPMENT GROUNDING ELECTRODE REQUIRED

11 ANY ANCHOR ROD PROJECTION SHORTER THAN 2 ¾" OR LONGER THAN 3 ¼" SHALL REQUIRE THE BASE TO BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.

12 FOR NON - BREAKAWAY INSTALLATIONS, 4 ½" ± 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
November 2018 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
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SDD 09C02 - 08

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6

6

DE PERE

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
SURVEYED		
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	CKK	03-2019

REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. C510

SDD 9c3 Transformer/Pedestal Bases

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

FOUR (4) BOLTS SHALL BE FURNISHED WITH EACH TRANSFORMER BASE. BOLTS SHALL BE 1" DIAMETER, 4" IN LENGTH, WITH WASHERS, LOCK WASHERS AND NUTS. BOLTS, NUTS AND WASHERS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 641.2.2 OF THE STANDARD SPECIFICATIONS.

LEVELING SHIMS, IF NEEDED, SHALL BE DESIGNED FOR THE PURPOSE AND USED UNDER CAST BASES WHEN PLUMBING POLES OR STANDARDS DURING INSTALLATION. THE USE OF WASHERS IN LIEU OF PROPER LEVELING SHIMS IS NOT ACCEPTABLE.

SHIM LENGTH SHALL BE LONG ENOUGH TO COMPLETELY COVER THE AREA UNDER THE LENGTH AND WIDTH OF THE BASE MOUNTING FLANGE.

DOUBLE NUTTING IS NOT ACCEPTABLE FOR LEVELING OR MOUNTING PURPOSES.

A NEMA APPROVED, U.L. LISTED, COPPER WITH BRASS OR STAINLESS STEEL SET SCREW, DIRECT BURY RATED, MECHANICAL CONNECTOR (LUG), SIZED TO ACCEPT AWG. #10 TO #4 COPPER STRANDED WIRE SHALL BE FURNISHED AND INSTALLED IN THE PEDESTAL AND TRANSFORMER BASES.

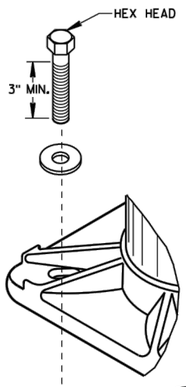
THE MECHANICAL CONNECTOR SHALL BE INSTALLED USING A 1/4" - 20 (TPI) STAINLESS STEEL HEX HEAD BOLT OF SUFFICIENT LENGTH TO FIRMLY ATTACH THE LUG TO THE BASE.

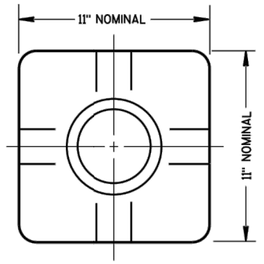
SHOULD THE MANNER OF ATTACHMENT OF THE LUG REQUIRE WASHERS, HEX NUTS, LOCK WASHER - THEY SHALL BE STAINLESS STEEL AS IS THE BOLT. THE MANNER OF ATTACHMENT SHALL NOT BLOCK ACCESSIBILITY TO WIRE PLACEMENT IN THE CONNECTOR.

PEDESTAL BASE COLLAR THREADING SHALL BE TAPERED AND IN ACCORDANCE WITH NATIONAL PIPE THREADING DIMENSIONS.

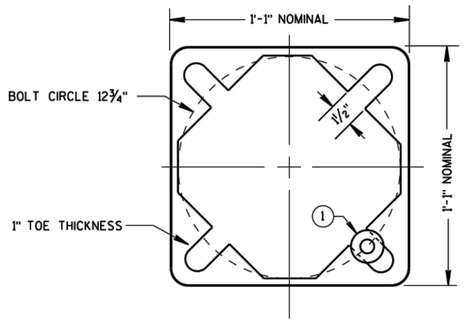
BASE COLLAR THREADING SHALL EXTEND INTO THE BASE COLLAR WITH SUFFICIENT DEPTH TO ACCEPT THE INSTALLATION OF TRAFFIC SIGNAL STANDARDS TO A DEPTH OF 1½", THEN TIGHTENING TO A POINT OF BEING IMMOVABLE.

THE ACCESS DOOR SHALL BE OF THE SAME MATERIAL AS THE BASE.

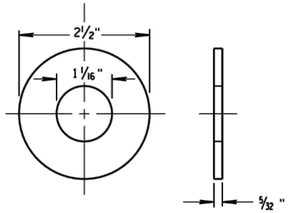




TOP VIEW
(PEDESTAL BASE)

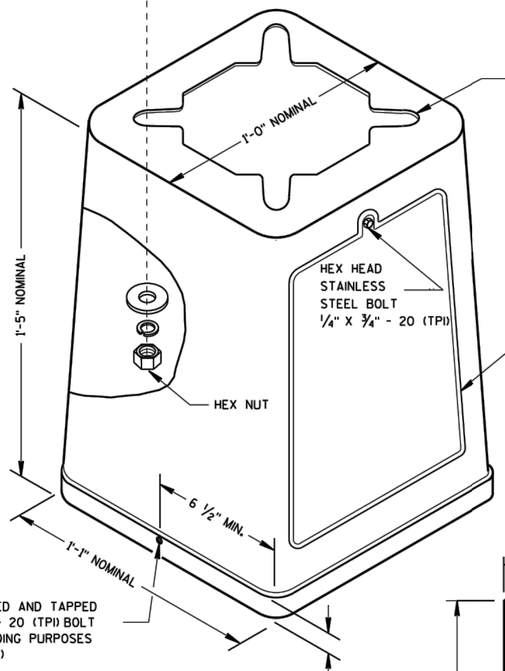


BOTTOM VIEW
(PEDESTAL BASE)

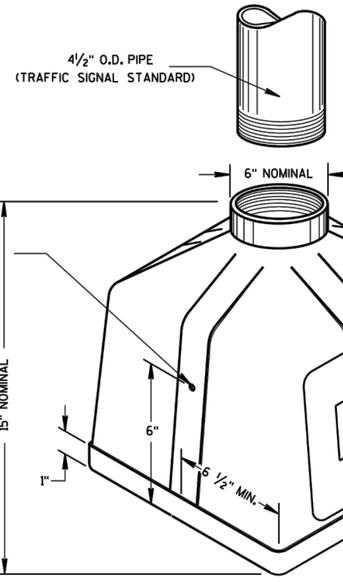


ZINC COATED STEEL WASHER
TO BE PROVIDED BY THE CONTRACTOR

PEDESTAL BASE WASHER (1)



ISOMETRIC VIEW



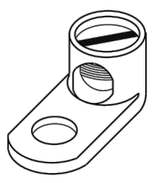
ISOMETRIC VIEW

PEDESTAL BASE

BOTTOM VIEW
(TRANSFORMER BASE)

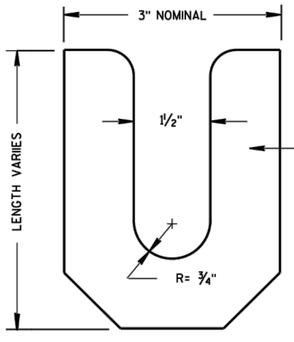
TRANSFORMER BASE

INTENDED FOR USE WITH TYPE 2, 3, 4, 5 & 6 POLES



TYPICAL MECHANICAL CONNECTOR LUG

TO BE FURNISHED WITH EACH BASE



LEVELING SHIM

TRANSFORMER/PEDESTAL BASES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept. 2014 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

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S.D.D. 9 C 3-4

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S.D.D. 9 C 3-4

DE PERE

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

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PROJECT # 19-18

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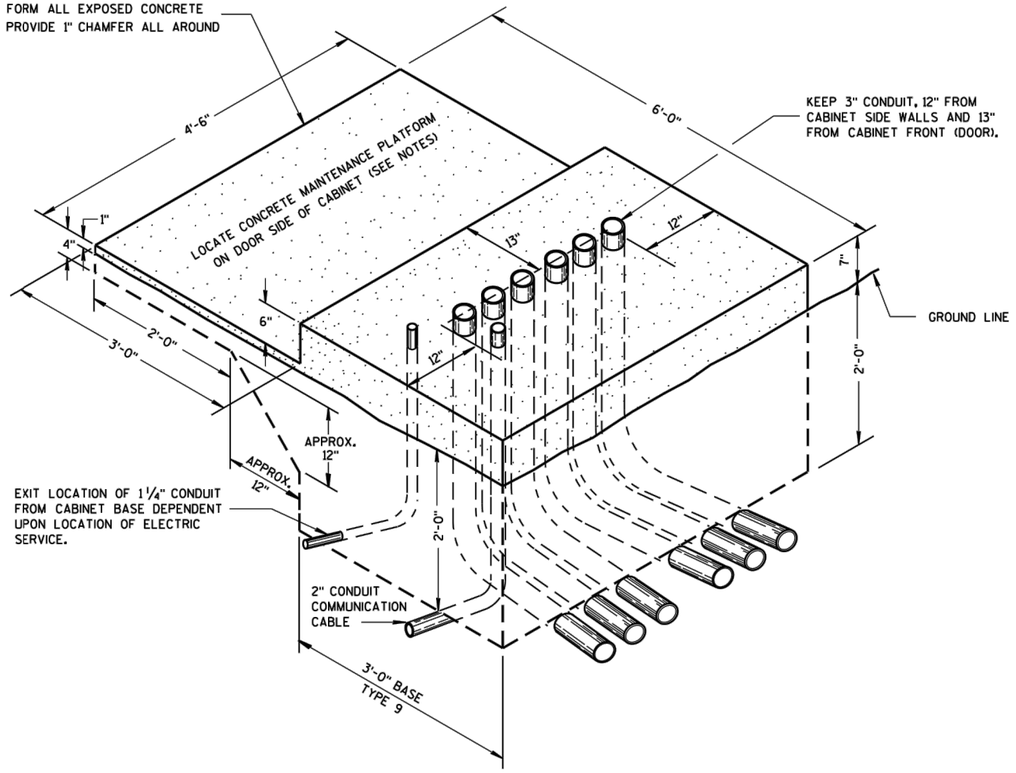
NO.	DATE	BY	REMARKS

PAGE NO. C511

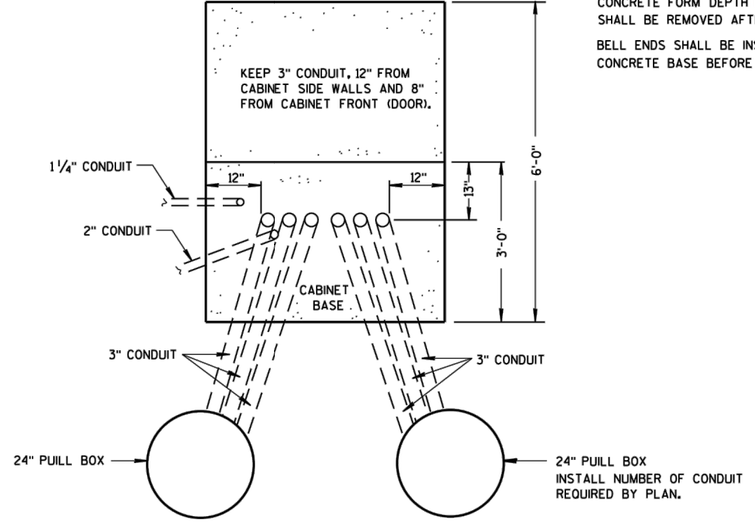
SDD 9c6 Concrete Control Cabinet Base, Type 9, Special



ISOMETRIC VIEW

TYPE 9, SPECIAL

(C.Y. CONCRETE = APPROX. 1.56)



PLAN VIEW

CONCRETE CONTROL CABINET BASE, TYPE 9, SPECIAL

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

INSTALL FOUR ½ INCH MINIMUM DIAMETER X 4 INCH MINIMUM LENGTH STAINLESS STEEL APPROVED CONCRETE MASONRY ANCHORS WITH A PULLOUT STRENGTH OF 9,000 LBS. TO ANCHOR THE CABINET TO TYPE 6, 7, 8, AND 9 BASES. THE ANCHOR STUDS SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO PROPERLY ANCHOR THE CONTROL CABINET TO THE BASE.

WHEN REQUIRED TO CONNECT NONMETALLIC CONDUIT TO METALLIC CONDUIT, ONLY ADAPTER FITTINGS, U.L. LISTED FOR ELECTRICAL USE, SHALL BE USED.

CONDUIT HEIGHT ABOVE THE CONCRETE BASE SHALL BE 1 INCH.

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.

CONTROL CABINET BASE TOP SURFACE SHALL BE TROWEL FINISHED SMOOTH AND LEVEL.

MAINTENANCE PLATFORM SHALL BE FLOAT OR BROOM FINISHED AND BE LEVEL.

MAINTENANCE PLATFORMS ARE NOT REQUIRED WHEN THE SURROUNDING AREA IS PAVED.

MINIMUM BENDING RADIUS OF CONDUIT = 6 X THE DIAMETER.

ALL METALLIC CONDUIT ENDS SHALL BE REAMED AND THREADED.

CAP ALL BELOW GRADE METALLIC CONDUIT ENDS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED.

PLUG ALL BELOW GRADE NONMETALLIC CONDUIT ENDS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED.

ALL CONDUIT ENDS AT THE TOP OF CONCRETE BASES SHALL BE CAPPED IF METALLIC OR PLUGGED IF NONMETALLIC IMMEDIATELY AFTER PLACEMENT AND BEFORE CONCRETE IS POURED. CONDUITS IN WHICH WIRE OR CABLE IS NOT BEING INSTALLED SHALL REMAIN CAPPED OR PLUGGED.

CONDUIT EXITING THE CONCRETE BASE (SIX THREE INCH) SHALL TERMINATE IN PULL BOXES AS SHOWN ON THE PLANS.

CONCRETE FORM DEPTH BELOW FINISHED GRADE SHALL BE 6" MAXIMUM. CONCRETE FORMS SHALL BE REMOVED AFTER CONCRETE HAS SET.

BELL ENDS SHALL BE INSTALLED ON ALL PVC CONDUIT EXPOSED AT THE TOP OF THE CONCRETE BASE BEFORE INSTALLATION OF CABLE OR WIRE.

CONCRETE CONTROL CABINET BASE, TYPE 9, SPECIAL

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept. 2014 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

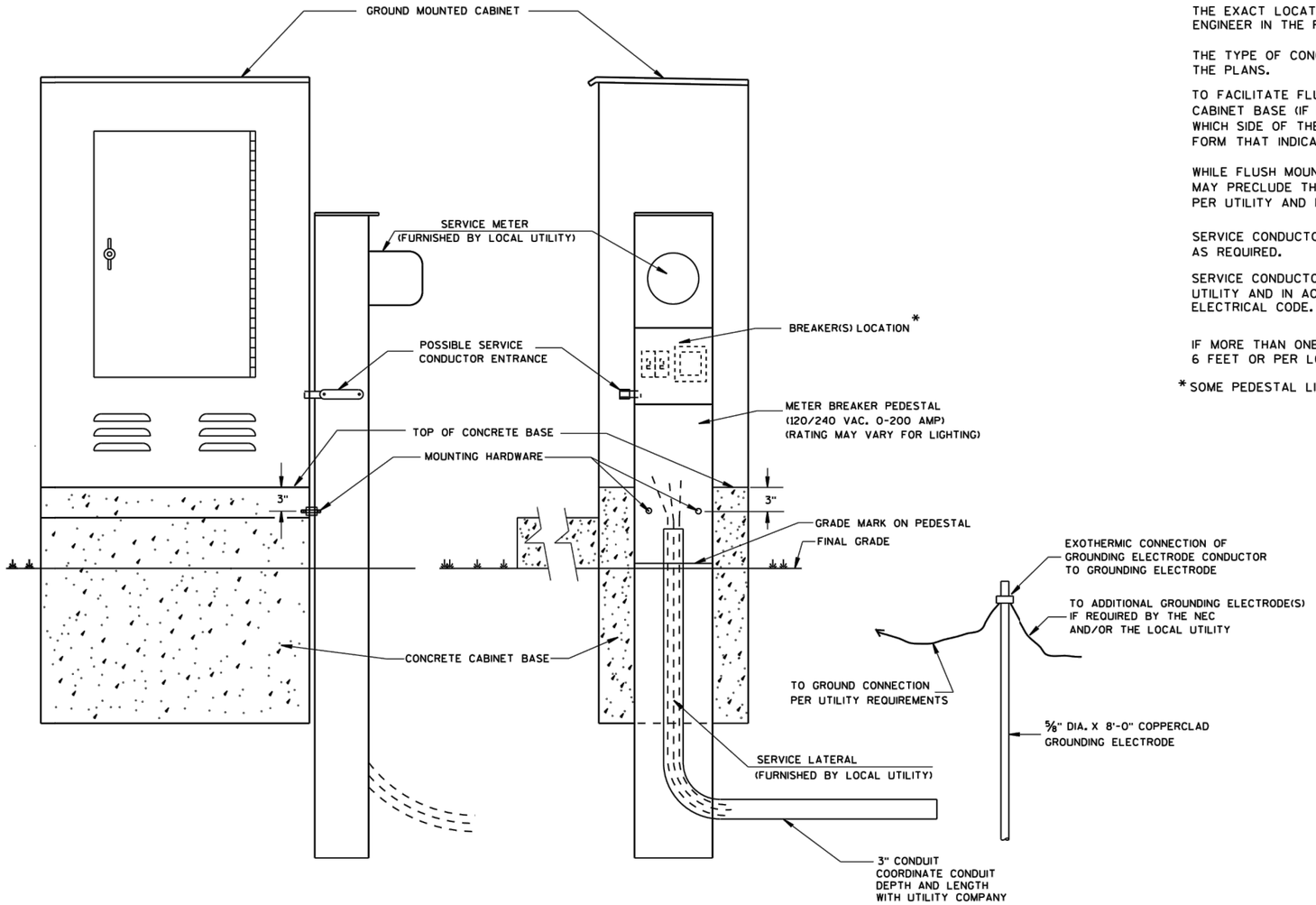
6

S.D.D. 9 C 6-7

6

S.D.D. 9 C 6-7

SDD 9d1 Cabinet Service Installation (Meter Breaker Pedestal)



TYPICAL CABINET SERVICE INSTALLATION

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

THE EXACT LOCATION OF THE METER BREAKER PEDESTAL SHALL BE DETERMINED BY THE ENGINEER IN THE FIELD.

THE TYPE OF CONCRETE CABINET BASE TO BE INSTALLED SHALL BE AS CALLED FOR IN THE PLANS.

TO FACILITATE FLUSH MOUNTING OF THE METER BREAKER PEDESTAL AGAINST THE SIDE OF THE CABINET BASE (IF FLUSH MOUNTING POSSIBLE. CONFER WITH THE LOCAL UTILITY TO DETERMINE WHICH SIDE OF THE CONCRETE BASE THE ELECTRICAL SERVICE LATERAL WILL APPROACH. THEN FORM THAT INDICATED SIDE FOR FULL SIDE DEPTH.

WHILE FLUSH MOUNTING IS THE MOST DESIRABLE MOUNTING CONFIGURATION UTILITY REQUIREMENTS MAY PRECLUDE THIS OPTION. CONTRACTOR MUST PROVIDE UTILITY APPROVED PEDESTAL AND INSTALL PER UTILITY AND MANUFACTURERS REQUIREMENTS.

SERVICE CONDUCTOR ENTRANCES SHALL BE RIGID METALLIC CONDUIT, NIPPLES AND/OR CONDULETS AS REQUIRED.

SERVICE CONDUCTOR ENTRANCES SHALL BE SIZED AND LOCATED AS REQUIRED BY THE LOCAL UTILITY AND IN ACCORDANCE WITH APPROPRIATE ARTICLES OF THE LATEST ACCEPTED NATIONAL ELECTRICAL CODE.

IF MORE THAN ONE GROUNDING ELECTRODE IS REQUIRED, THE DISTANCE APART SHALL BE 6 FEET OR PER LOCAL UTILITY REGULATIONS.

* SOME PEDESTAL LIGHTING PLANS SHOW MAIN LUGS ONLY.

6

S.D.D. 9 D 1-5

6

S.D.D. 9 D 1-5

CABINET SERVICE INSTALLATION (METER BREAKER PEDESTAL)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Sept. 2014 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
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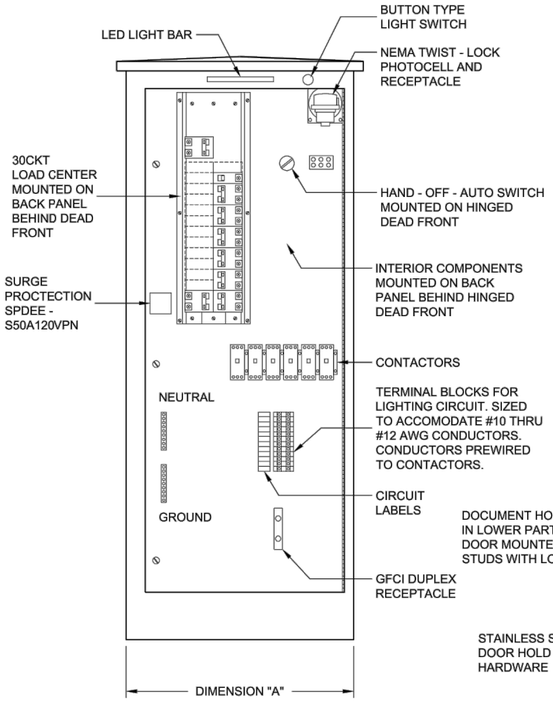
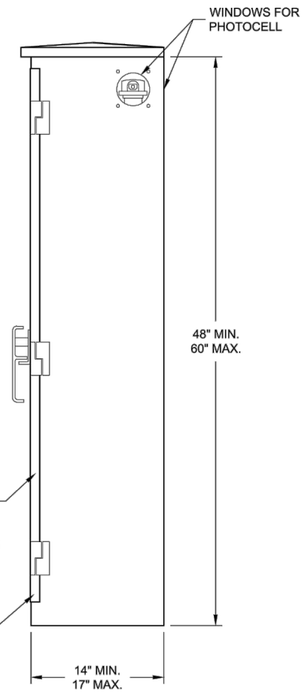
SDD 9d4 Lighting Control Cabinet 120/240 Volt

FRONT INTERIOR ELEVATION



SIDE VIEW



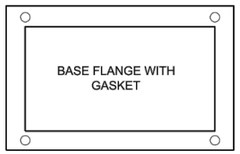
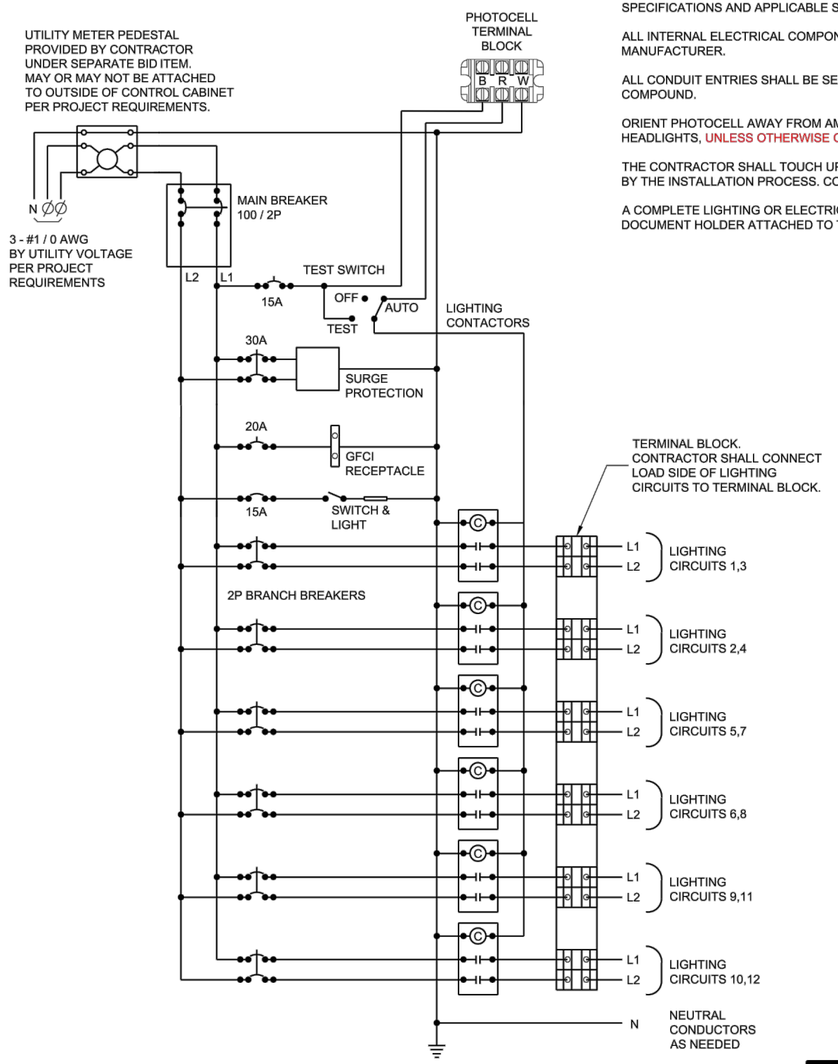


TABLE OF DIMENSIONS (INCHES)		
CONCRETE BASE TYPE	CABINET WIDTH	DIMENSION "A"
L24	24"	24"
L30	30"	30"

LIGHTING CONTROL CABINET



CONTROL CABINET SCHEMATIC

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND APPLICABLE SPECIAL PROVISIONS.

ALL INTERNAL ELECTRICAL COMPONENTS WILL BE PRE - WIRED BY THE CABINENT MANUFACTURER.

ALL CONDUIT ENTRIES SHALL BE SEALED WITH AN APPROPRIATE DUCT SEALING COMPOUND.

ORIENT PHOTOCELL AWAY FROM AMBIENT LIGHT SOURCES AND ONCOMING TRAFFIC HEADLIGHTS, UNLESS OTHERWISE CALLED FOR IN THE SPECIAL PROVISION.

THE CONTRACTOR SHALL TOUCH UP ANY DAMAGE TO THE ANODIZED FINISH CAUSED BY THE INSTALLATION PROCESS. COLOR MATCH PAINT SHALL BE USED.

A COMPLETE LIGHTING OR ELECTRICAL PLAN SHALL BE SECURELY PLACED IN THE DOCUMENT HOLDER ATTACHED TO THE DOOR.

LIGHTING CONTROL CABINET
120 / 240 VOLT

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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6

6

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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
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ENTERPRISE DRIVE & PROSPER STREET
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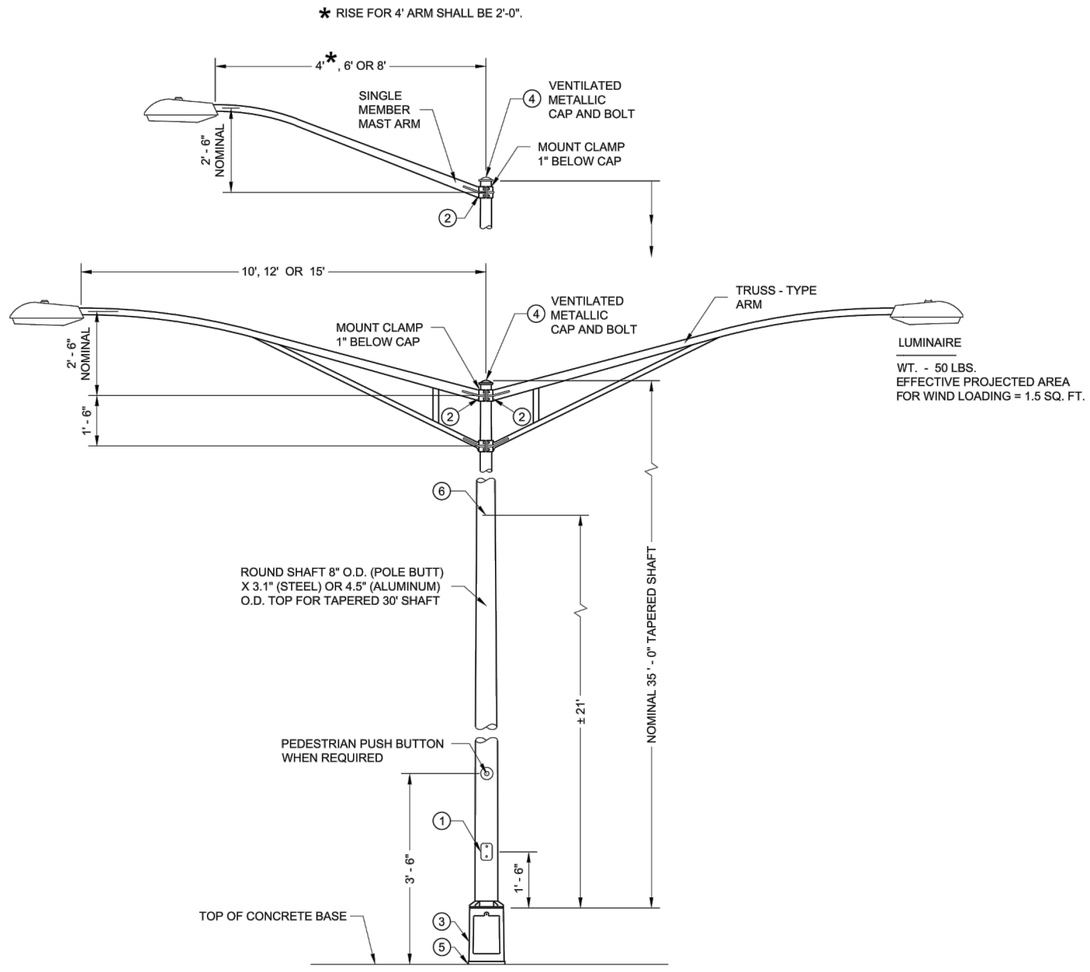
PAGE NO. C514

SDD 9e1-e Pole Mountings for Traffic Signals and Lighting Units Type 6 (35 feet)



TYPE 6 POLE MOUNTING CONFIGURATION
(MAXIMUM LOAD)
LIGHTING ONLY

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

SECTION 657, POLES, OF THE STANDARD SPECIFICATIONS SHALL APPLY TO THIS DRAWING.

ALL TYPE 6 POLE MOUNTINGS SHALL BE DESIGNED TO INCLUDE TWIN 15' ARMS WITH LUMINAIRES.

POLES SHALL BE GALVANIZED STEEL OR ALUMINUM, AS CALLED FOR IN THE CONTRACT.

TYPE 6 ALUMINUM POLES SHALL BE CONSTRUCTED OF 6063 - T6 ALUMINUM ALLOY. SLEEVING INSIDE THE POLE IS NOT ACCEPTABLE.

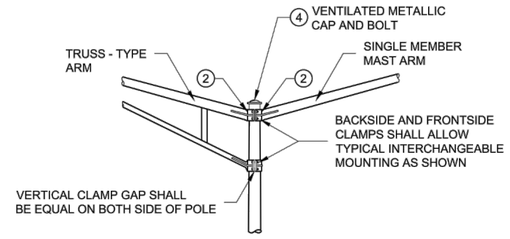
TYPE 6 ALUMINUM POLES SHALL HAVE A MINIMUM WALL THICKNESS OF 0.219".

TYPE 6 STEEL POLES SHALL HAVE A MINIMUM WALL THICKNESS OF U.S. STANDARD 11 GAGE (0.1196").

THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 2 ⅜ INCHES IN OUTSIDE DIAMETER. THE STRAIGHT PORTION OF THE SLIPFITTER END OF THE LUMINAIRE MAST ARM SHALL BE A NOMINAL 12 INCHES IN LENGTH.

WHEN TRANSFORMER BASES ARE USED, WIRE CONNECTIONS SHALL BE MADE IN THE TRANSFORMER BASE.

1. 4" X 6" REINFORCED HANDHOLE AND COVER ASSEMBLY WITH TWO (2) ½" X ¾" - 20 TPI , STAINLESS STEEL, HEX HEAD BOLTS.
2. GROMMETS. 1" CHASE NIPPLES OR 1" CLOSE CONDUIT NIPPLES WITH BUSHINGS SHALL BE PROVIDED FOR 1 ⅜" HOLE IN POLE SHAFT FOR WIRING.
3. CAST ALUMINUM TRANSFORMER BASE, WHEN REQUIRED.
4. FURNISH AND INSTALL VENTILATED, CAST METALLIC (ALUMINUM ALLOY) CAPS. FASTEN CAPS WITH ONE (1) ¼" X ¾" - 20 TPI STAINLESS STEEL, HEX HEAD BOLT.
5. SHIMMING, IF NEEDED, SHALL BE LOCATED BETWEEN THE CONCRETE FOUNDATION AND POLE.
6. INTERNAL DUMBBELL - TYPE VIBRATION DAMPER.



INTERCHANGEABLE MOUNTING DETAIL

6

SDD 09E01 - 15e

POLE MOUNTINGS FOR LIGHTING UNITS, TYPE 6 (35 FEET)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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SDD 09E01 - 15e

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ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
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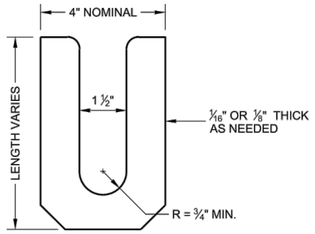
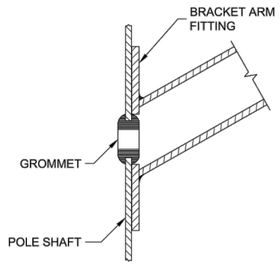
NO.	DATE	BY	REMARKS

PAGE NO. C515

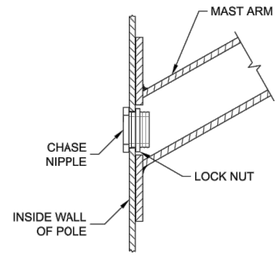
SDD 9e1-g Hardware Details for Pole Mountings



LEVELING SHIM (1)
SHALL BE ALUMINUM



TYPICAL APPLICATION OF GROMMET IN POLE SHAFT



TYPICAL APPLICATION OF CHASE NIPPLE IN POLE SHAFT

GENERAL NOTES

CLAMP BOLT-NUT TIGHTENING TORQUE SHALL BE INDICATED BY INDENT STAMPING (1/2 INCH NUMERALS AND LETTERS) OR WEATHERPROOF PRINTING ON THE INSIDE OF THE CLAMP THAT IS WELDED TO THE ARM MEMBER.

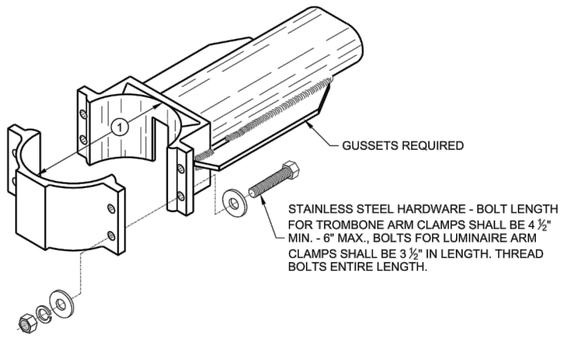
(1) 4.5" I.D. FOR LUMINAIRE MAST ARM CLAMP. 6.625" I.D. FOR TROMBONE MAST ARM CLAMP.

(2) INDIVIDUAL BASE PLATE ANCHOR ROD COVERS. (4 REQUIRED)

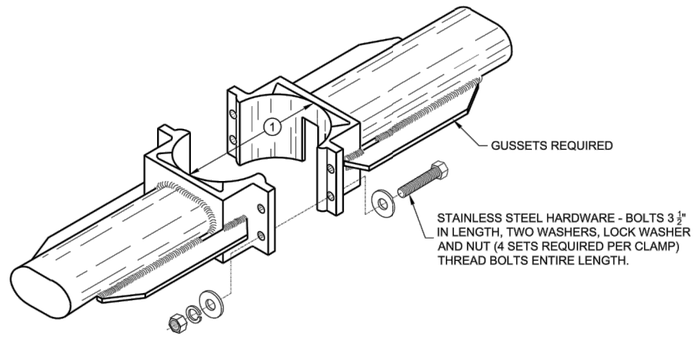
(3) BASE PLATE SLOTTED TO ACCEPT 11" THROUGH 12" BOLT CIRCLE USING 1" DIAMETER ANCHOR RODS.

(4) LEVELING SHIMS, DESIGNED FOR THE PURPOSE, SHALL BE USED WHEN PLUMBING POLES. THE USE OF WASHERS IN LIEU OF PROPER LEVELING SHIMS IS NOT ACCEPTABLE. LEVELING SHIMS SHALL BE USED ONLY BETWEEN THE TOP OF THE CONCRETE BASE AND A METALLIC BASE PLATE.

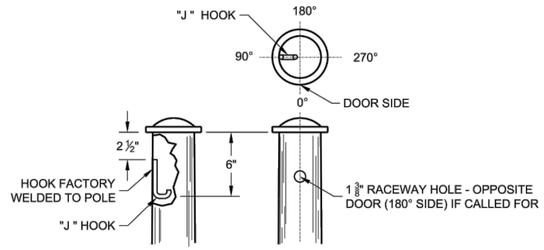
SHIMS SHALL BE LONG ENOUGH AND WIDE ENOUGH TO COMPLETELY COVER THE AREA UNDER THE LENGTH AND WIDTH OF THE BASE MOUNTING FLANGE.



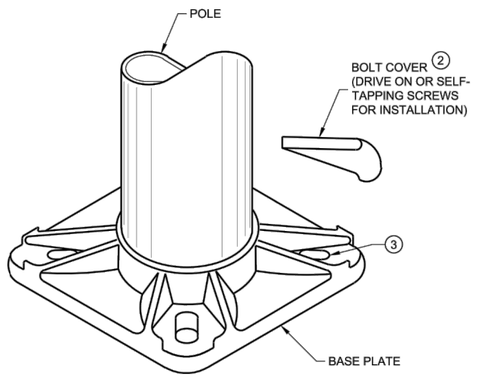
TYPICAL TROMBONE MAST ARM AND SINGLE LUMINAIRE MAST ARM MOUNTING CLAMP



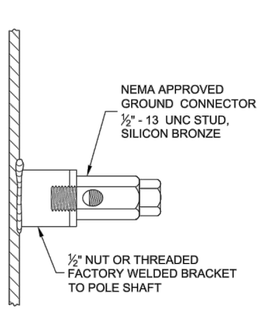
TYPICAL LUMINAIRE MAST ARM (DOUBLE) MOUNTING BRACKETS

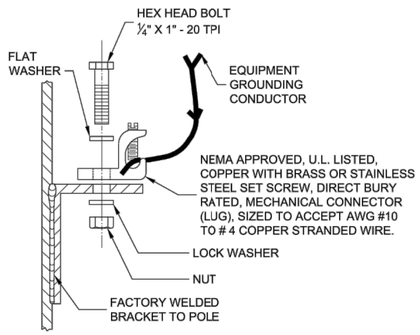


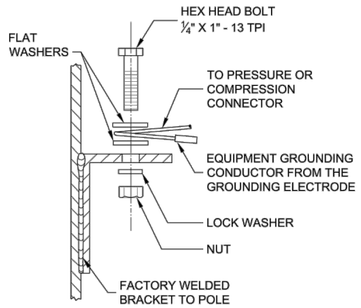
TYPICAL "J" HOOK LOCATION



BASE PLATE







TYPICAL GROUNDING CONNECTIONS
NUT, BOLT AND WASHERS SHALL BE STAINLESS STEEL

HARDWARE DETAILS FOR POLE MOUNTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018 — DATE
/S/ Ahmet Demirbilek — STATE ELECTRICAL ENGINEER
FHWA

SDD 09A01 - 15g

SDD 09A01 - 15g

6

DE PERE

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY
PROJECT # 19-18

	BY	DATE
SURVEYED		
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	CKK	03-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. C516

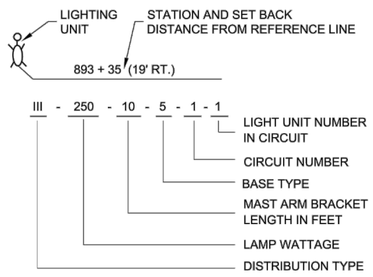
SDD 9e3 Non-Freeway Lighting Unit Pole Wiring

GENERAL NOTES

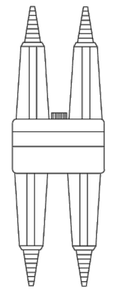
DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

THE EQUIPMENT GROUND CONNECTOR SHALL BE TAPED WITH 3 WRAPS (MINIMUM) OF APPROVED RUBBER TAPE AND 3 WRAPS (MINIMUM) OF APPROVED VINYL TAPE TO COVER SHARP WIRE ENDS AFTER THE CONNECTION IS COMPLETED.

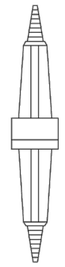
WHEN TRANSFORMER BASES ARE USED, ALL WIRING CONNECTIONS SHALL OCCUR WITHIN THE TRANSFORMER BASES.



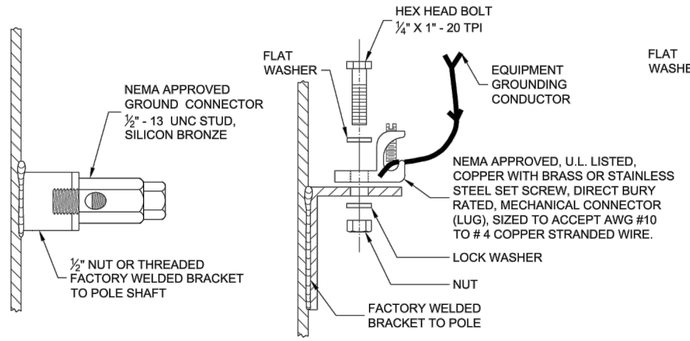
LIGHTING UNIT CODE
(TYPICAL)



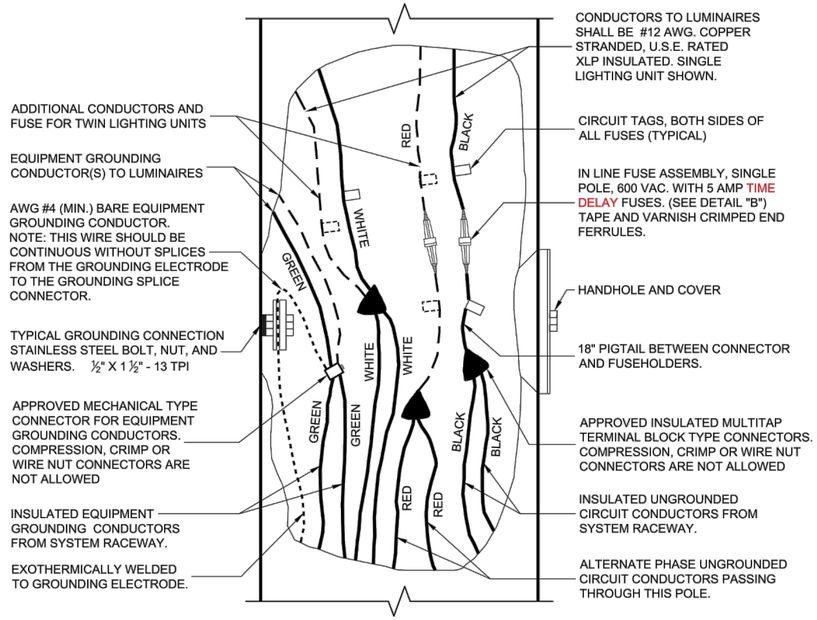
DETAIL "A"
BREAKAWAY
DOUBLE POLE WITH WATERPROOF INSULATING BOOT



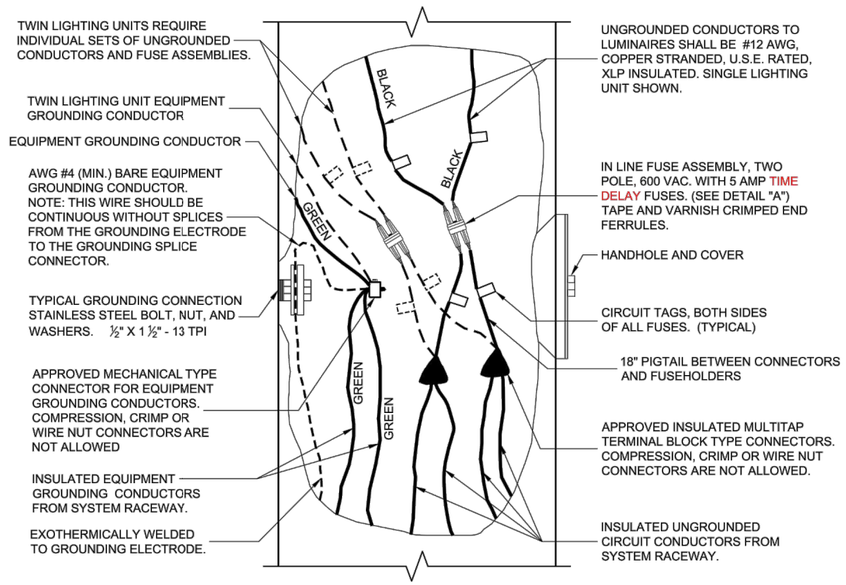
DETAIL "B"
BREAKAWAY
SINGLE POLE WITH WATERPROOF INSULATING BOOT



TYPICAL GROUNDING CONNECTIONS
NUT, BOLT AND WASHERS SHALL BE STAINLESS STEEL



3 WIRE - 120, 240 OR 480 VAC (UNGROUNDED CONDUCTORS) WITH GROUNDING CONDUCTOR AND EQUIPMENT GROUNDING CONDUCTOR



2 WIRE - 240 OR 480 VAC (UNGROUNDED CONDUCTORS) WITH EQUIPMENT GROUNDING CONDUCTOR

NON - FREEWAY LIGHTING UNIT POLE WIRING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
November 2018
DATE

/S/ Ahmet Demirbilek
STATE ELECTRICAL ENGINEER

FHWA

6

SDD 09E03 - 06

6

SDD 09E03 - 06

DE PERE

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

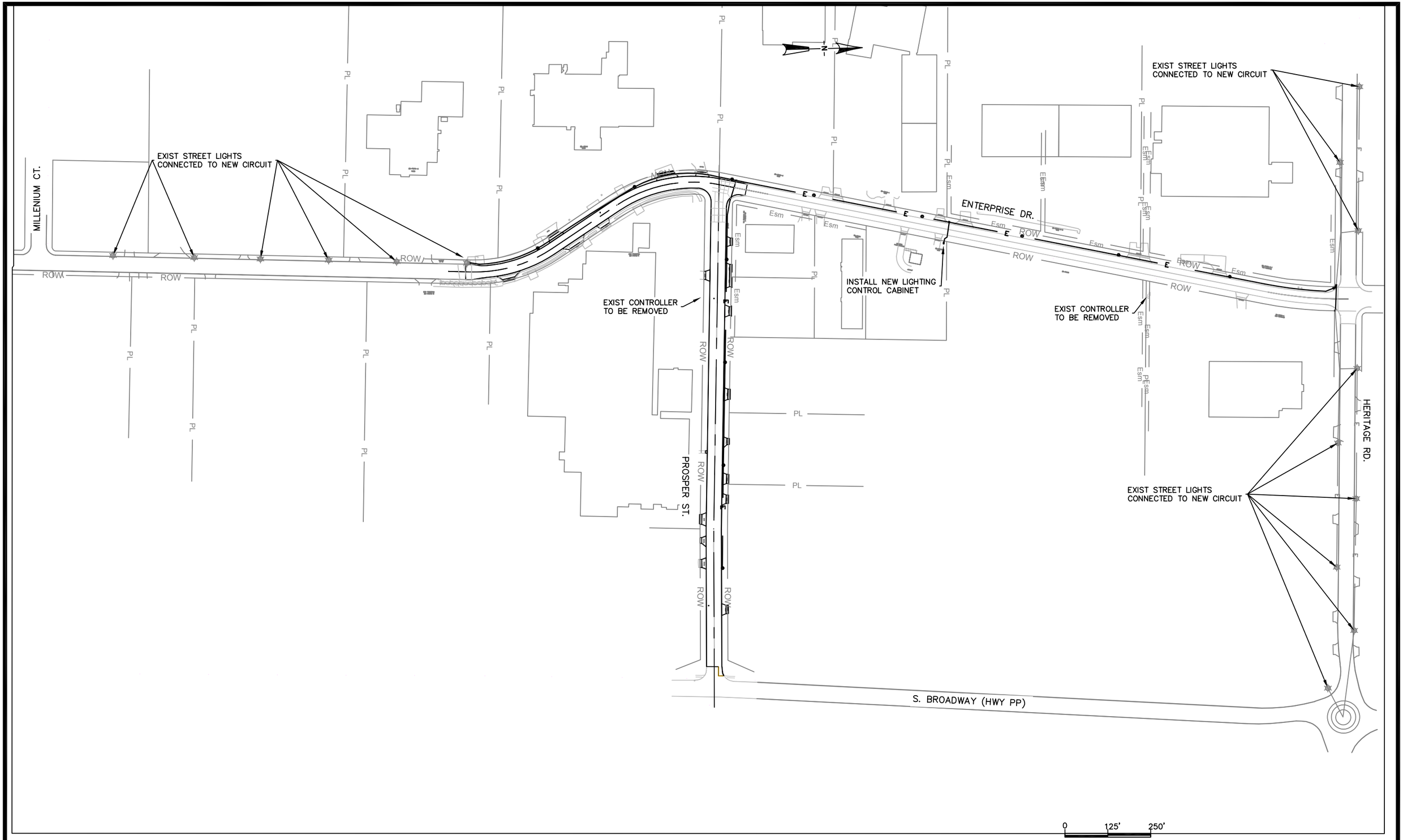
PROJECT # 19-18

	BY	DATE
SURVEYED		
DRAWN	MAL	03-2019
DESIGNED	MAL	03-2019
CHECKED	CKK	03-2019

REVISIONS / ISSUES

NO.	DATE	BY	REMARKS

PAGE NO. C517



DE PERE

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-339-4061 FAX 920-339-4071

OVERALL LIGHTING SYSTEM

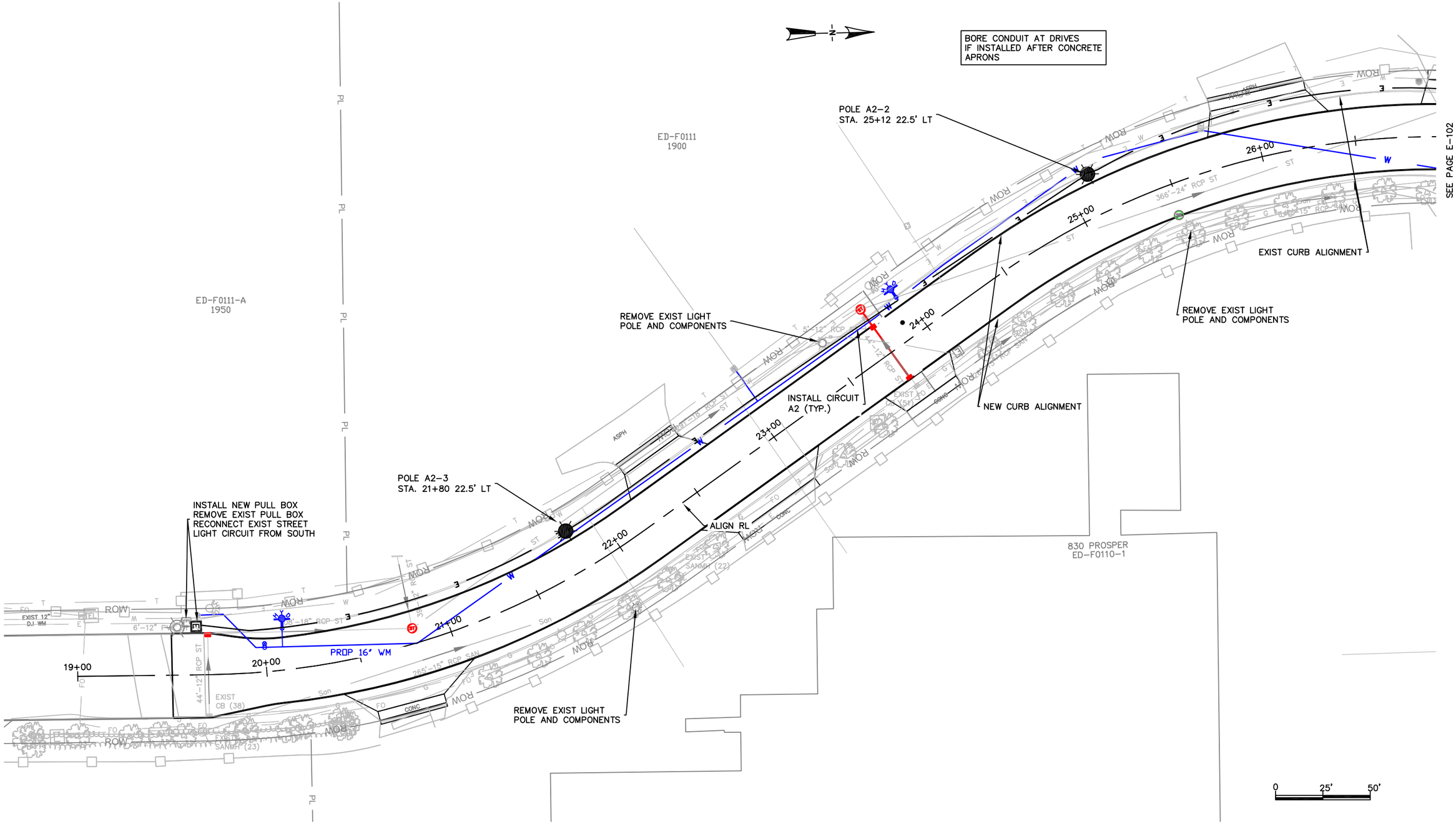
NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY

PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
DRAWN	BJK	02-2019
DESIGNED	MAL	02-2019
CHECKED	CKK	02-2019

REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **E101**



DE PERE	**CITY OF DE PERE** ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115 OFFICE 920-339-4061 FAX 920-339-4071	**STREET LIGHT REMOVAL AND REPLACEMENT**	NAME: ENTERPRISE & PROSPER RECONSTRUCTION AND UTILITY RELAY PROJECT # 19-18

	BY	DATE
SURVEYED	BJK	08-2018
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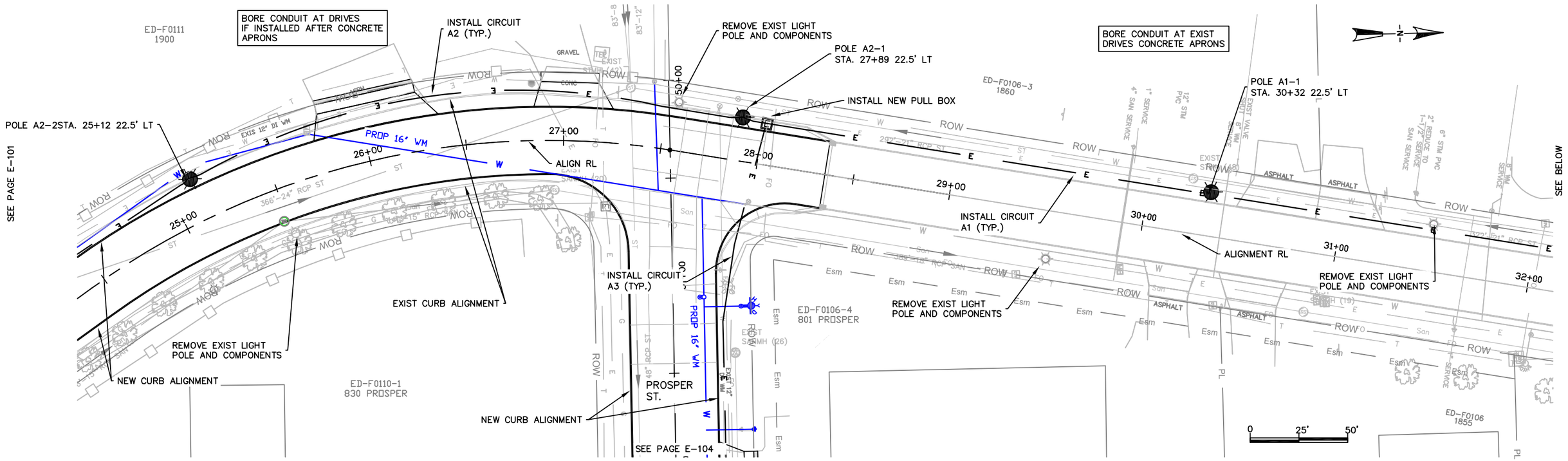
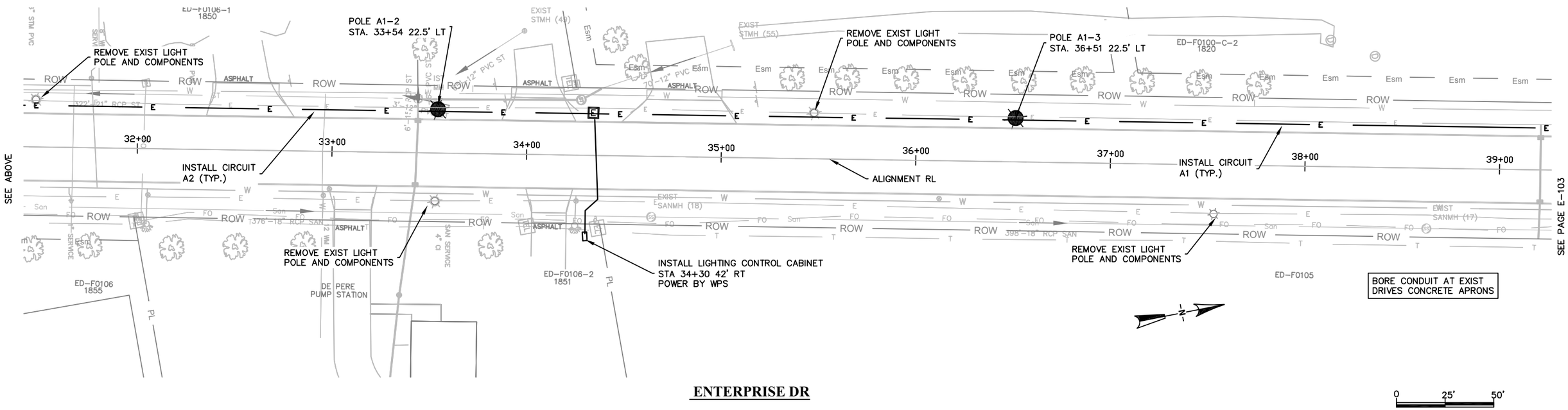
REVISIONS / ISSUES			
NO.	DATE	BY	REMARKS

PAGE NO. **E102**



ENTERPRISE DR



ENTERPRISE DR

DE PERE

CITY OF DE PERE

ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
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STREET LIGHT REMOVAL AND REPLACEMENT

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PAGE NO. **E103**

POLE A1-4
STA. 39+37 22.5' LT

REMOVE EXIST LIGHT
POLE AND COMPONENTS

POLE A1-5
STA. 42+68 22.5' LT

ED-F0100-C-1
700 HERITAGE

REMOVE EXIST LIGHT
POLE AND COMPONENTS

INSTALL NEW PULL BOX
INSTALL WIRE AND CONDUIT
RECONNECT TO EXIST CIRCUITS WEST
INSTALL NEW WIRE AND CONDUIT
TO EAST

POLE A1-6
STA. 45+80 22.5' LT

39+00 40+00 41+00 42+00 43+00 44+00 45+00 45+89

INSTALL CIRCUIT
A1 (TYP.)

ALIGNMENT RL

INSTALL NEW PULL BOX.
RECONNECT TO EXIST
CIRCUITS TO EAST

REMOVE EXIST LIGHT
POLE AND COMPONENTS

DISCONNECT EXIST POWER
SOURCE. REMOVE AND
SALVAGE CONTROL BOX
AND PHOTO EYE TO CITY

POLE MOUNTED
CONTROL BOX

BORE CONDUIT AT EXIST
DRIVES CONCRETE APRONS

ED-F0100-1
800 HERITAGE

BORE CONDUIT AT DRIVES
IF INSTALLED AFTER CONCRETE
APRONS

SEE PAGE E-102

ENTERPRISE DR

0 25' 50'

SEE PAGE E-102

ENTERPRISE
DR.

INSTALL NEW PULL BOX

POLE A2-3
STA. 27+89 22.5' LT

BORE CONDUIT AT
CONCRETE PAVEMENT

POLE A3-1
STA. 52+53.50 25.5' LT

INSTALL NEW PULL BOX

REMOVE EXIST LIGHT
POLE AND COMPONENTS

POLE A3-2
STA. 55+53.5 25.5' LT

REMOVE EXIST LIGHT
POLE AND COMPONENTS

ED-F0106-4
801 PROSPER ST.

ED-F0106-4
809

ED-F0107-1
815

REMOVE EXIST LIGHT
POLE AND COMPONENTS

50+00 51+00 52+00 3+00 54+00 55+00 56+00 57+00

INSTALL CIRCUIT A3 (TYP.)

PROP 16" WM

BORE CONDUIT AT
CONCRETE PAVEMENT

ALIGNMENT RL

DISCONNECT EXIST POWER
SOURCE. REMOVE AND
SALVAGE CONTROL BOX
AND PHOTO EYE TO CITY

BORE CONDUIT AT DRIVES
IF INSTALLED AFTER CONCRETE
APRONS

ED-F0110-1
830

SEE PAGE E-101

SEE PAGE E-104

PROSPER ST

0 25' 50'

DE PERE

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STREET LIGHT REMOVAL AND REPLACEMENT

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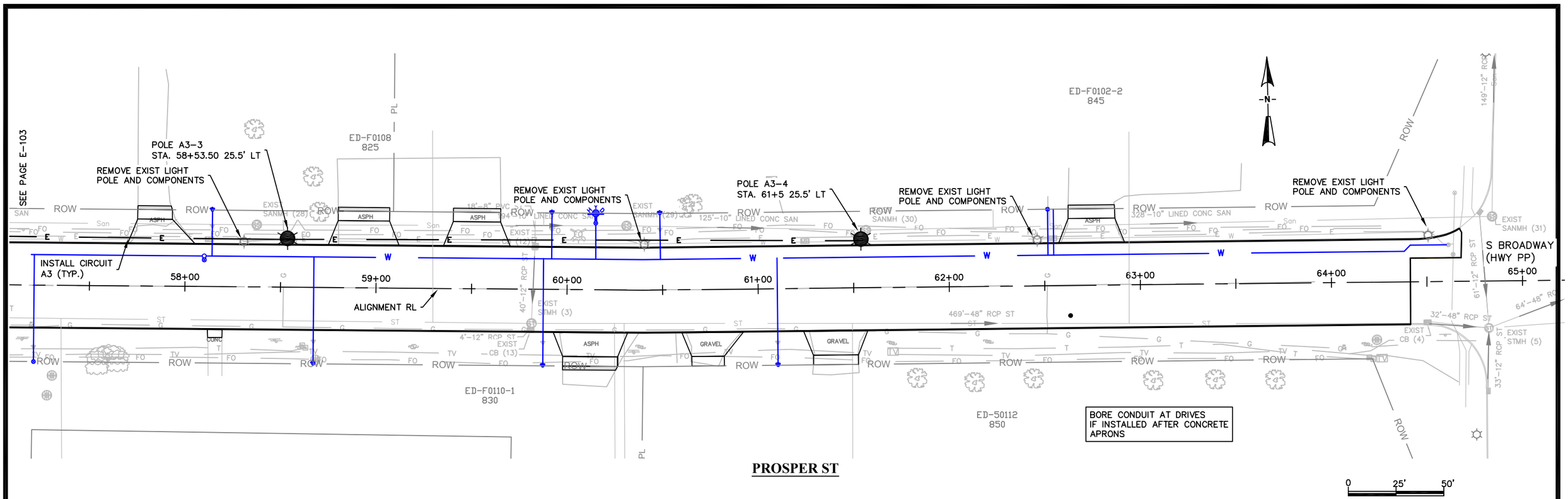
REVISIONS / ISSUES NO.	DATE	BY	REMARKS

PAGE NO. E104



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PAGE NO. **E105**