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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01 22 04 MEASUREMENT AND PAYMENT STREET & DRAINAGE CONSTRUCTION
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EXHIBITS
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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

CITY OF DE PERE 2019 STANDARD SPECIFICATIONS

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00 70 00 GENERAL CONDITIONS
(See City of De Pere 2019 Standard Specifications)

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DIVISION 32 – EXTERIOR IMPROVEMENTS
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(See City of De Pere 2019 Standard Specifications)
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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.
Project 19-18

Prosper Street and Enterprise Drive Reconstruction and Utility Relay

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
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. 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 waived 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 -
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:

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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.

3/7/2019

00 41 13-1

Bid Form
ATTACHMENTS TO THIS BID

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

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

BID SUBMITTAL

This Bid is submitted by ____________________________ of _______________________

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

Bidder, if Bidder is:

An Individual

Name (typed or printed): ______________________________

By: ______________________________
   (Individual’s signature)

Doing business as: ______________________________

A Partnership

Partnership Name: ______________________________

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

Name (typed or printed): ______________________________

A Corporation

Corporation Name: ______________________________

State of Incorporation: ______________________________

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

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

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<td>SS-02</td>
<td>Provide 6&quot; or 4&quot; Saddle to Existing Sanitary Sewer</td>
<td>EA</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS-03</td>
<td>Dig Down to Verify Lateral Material and Size</td>
<td>EA</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST-01</td>
<td>Remove and Replace 12” PVC or RCP (Class III) Storm Sewer</td>
<td>LF</td>
<td>50</td>
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<tr>
<td>ST-02</td>
<td>Remove and Replace 4’ Diameter Storm Manhole</td>
<td>VF</td>
<td>8</td>
<td></td>
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<tr>
<td>ST-03</td>
<td>Remove and Replace Type B Inlet</td>
<td>EA</td>
<td>3</td>
<td></td>
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</tr>
<tr>
<td>ST-04</td>
<td>Dig Down and Pour Crown on Storm Sewer Utility Hit (48” Storm Sewer)</td>
<td>EA</td>
<td>3</td>
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<tr>
<td>W-01</td>
<td>Provide 16&quot; PVC Water Main (Granular Backfill)</td>
<td>LF</td>
<td>2,200</td>
<td></td>
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<tr>
<td>W-02</td>
<td>Provide 16&quot; PVC Water Main (Natural Backfill)</td>
<td>LF</td>
<td>150</td>
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<tr>
<td>W-03</td>
<td>Provide 12” PVC Water Main (Granular Backfill)</td>
<td>LF</td>
<td>60</td>
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<tr>
<td>W-04</td>
<td>Provide 10&quot; PVC Water Main for Water Service</td>
<td>LF</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W-05</td>
<td>Provide 8&quot; PVC Water Main for Water Service</td>
<td>LF</td>
<td>60</td>
<td></td>
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<tr>
<td>W-06</td>
<td>Provide 6&quot; PVC Hydrant Lead or Water Service</td>
<td>LF</td>
<td>120</td>
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</table>
## WATER MAIN CONTINUED

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-07</td>
<td>Provide 2&quot; Corporation with Plug/Saddle with 2&quot; HDPE</td>
<td>EA</td>
<td>2</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-08</td>
<td>Provide 1.5&quot; HDPE Water Service</td>
<td>LF</td>
<td>25</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-09</td>
<td>Provide 1.5&quot; Corporation and Curb Stop</td>
<td>EA</td>
<td>1</td>
<td>$</td>
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<tr>
<td>W-10</td>
<td>Provide 1&quot; HDPE Water Service</td>
<td>LF</td>
<td>320</td>
<td>$</td>
<td>$</td>
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<tr>
<td>W-11</td>
<td>Provide 1&quot; Corporation and Curb Stop</td>
<td>EA</td>
<td>10</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-12</td>
<td>Provide 16&quot; Butterfly Valve</td>
<td>EA</td>
<td>3</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-13</td>
<td>Provide 10&quot; Gate Valve</td>
<td>EA</td>
<td>1</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-14</td>
<td>Provide 8&quot; Gate Valve</td>
<td>EA</td>
<td>1</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-15</td>
<td>Provide 6&quot; Gate Valve</td>
<td>EA</td>
<td>6</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-16</td>
<td>Provide Hydrant 7.0' Bury</td>
<td>EA</td>
<td>5</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-17</td>
<td>Provide Connection to Existing Water Main</td>
<td>EA</td>
<td>4</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-18</td>
<td>Provide Watermain 1/2 Offset</td>
<td>EA</td>
<td>1</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-19</td>
<td>Dig Down and Verify Water Lateral Size and Material</td>
<td>EA</td>
<td>13</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>W-20</td>
<td>Abandon/Remove Water Main and Appurtenances</td>
<td>LS</td>
<td>1</td>
<td>$</td>
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</table>

## STREET AND DRAINAGE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD-01</td>
<td>Unclassified Excavation</td>
<td>CY</td>
<td>5,300</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-02</td>
<td>Provide 1 1/4&quot; Crushed Aggregate Base Course</td>
<td>TON</td>
<td>8,500</td>
<td>$</td>
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</table>
## STREET AND DRAINAGE CONTINUED

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD-03</td>
<td>Provide Asphalt Patch (Driveway)</td>
<td>SY</td>
<td>90</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-04</td>
<td>Provide 24&quot; Integral Curb</td>
<td>LF</td>
<td>4,500</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SD-05</td>
<td>Remove Concrete Pavement with integral curb</td>
<td>SY</td>
<td>11,500</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SD-06</td>
<td>Remove Asphallic Concrete Pavement (Driveway)</td>
<td>SY</td>
<td>775</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-07</td>
<td>Remove Concrete Pavement (Driveway)</td>
<td>SY</td>
<td>240</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SD-08</td>
<td>Provide 9-Inch Doweled Concrete Pavement with Integral Curb and Gutter</td>
<td>SY</td>
<td>8,200</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-09</td>
<td>Provide 9-Inch Doweled Concrete Pavement with Integral Curb and Gutter (HES-3 Day)</td>
<td>SY</td>
<td>1,450</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SD-10</td>
<td>Provide 8-Inch Concrete Driveway and Sidewalk</td>
<td>SY</td>
<td>1,300</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SD-11</td>
<td>Provide #4 Reinforcement Bars for Curb and Sidewalk</td>
<td>LF</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-12</td>
<td>Drilled Tie Bars</td>
<td>EA</td>
<td>50</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SD-13</td>
<td>Landscaping – Topsoil, Seed, Fertilizer and Mulch</td>
<td>SY</td>
<td>2,500</td>
<td>$</td>
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</tbody>
</table>

## SPECIAL CONSTRUCTION

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-01</td>
<td>Pipe Foundation Stabilization</td>
<td>CY</td>
<td>100</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-02</td>
<td>Inlet Protection</td>
<td>EA</td>
<td>15</td>
<td>$</td>
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<tr>
<td>SC-03</td>
<td>Tracking Pad</td>
<td>EA</td>
<td>2</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-04</td>
<td>Adjust Inlet</td>
<td>EA</td>
<td>6</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-05</td>
<td>Adjust Manhole</td>
<td>EA</td>
<td>2</td>
<td>$</td>
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</table>
## Item Description Table

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-06</td>
<td>Reconstruct Manhole</td>
<td>VF</td>
<td>4</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-07</td>
<td>Traffic Control</td>
<td>LS</td>
<td>1</td>
<td>$</td>
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<tr>
<td>SC-08</td>
<td>Traffic Control Detour Route</td>
<td>LS</td>
<td>1</td>
<td>$</td>
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<tr>
<td>SC-09</td>
<td>Salvage Fence and Replace</td>
<td>LS</td>
<td>1</td>
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</table>

**BASE BID TOTAL**

$
### ALTERNATE BID SCHEDULE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ITEM DESCRIPTION</th>
<th>UNIT</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT BID</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-10</td>
<td>Remove Existing Light Pole Base</td>
<td>EA</td>
<td>13</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SC-11</td>
<td>Remove Existing Light Pole (Salvage to City)</td>
<td>EA</td>
<td>13</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SC-12</td>
<td>Conduit Rigid Nonmetallic Schedule 40, 2-Inch</td>
<td>LF</td>
<td>4,000</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SC-13</td>
<td>Conduit Bored, 2-Inch</td>
<td>LF</td>
<td>500</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SC-14</td>
<td>Pull Box 24x42 Inch</td>
<td>EA</td>
<td>5</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>SC-15</td>
<td>Concrete Base, Type 5</td>
<td>EA</td>
<td>13</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-16</td>
<td>Concrete Control Cabinet Base, Type L24</td>
<td>EA</td>
<td>1</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-17</td>
<td>Electrical Wire Lighting 12 AWG</td>
<td>LF</td>
<td>4,500</td>
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<tr>
<td>SC-18</td>
<td>Electrical Wire Lighting 4 AWG</td>
<td>LF</td>
<td>6,000</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-19</td>
<td>Electrical Service Meter Breaker Pedestal</td>
<td>LS</td>
<td>1</td>
<td>$</td>
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<tr>
<td>SC-21</td>
<td>Poles Type 5-Aluminium, Anodized Black</td>
<td>EA</td>
<td>13</td>
<td>$</td>
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<tr>
<td>SC-22</td>
<td>Luminaire Arms Single Member 4-1/2 Inch Clamp, 8-foot, Anodized Black</td>
<td>EA</td>
<td>13</td>
<td>$</td>
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<tr>
<td>SC-23</td>
<td>Luminaires Utility LED C</td>
<td>EA</td>
<td>13</td>
<td>$</td>
<td>$</td>
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<tr>
<td>SC-24</td>
<td>Lighting Control Cabinet, 120/240 24-inch</td>
<td>EA</td>
<td>1</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**ALTERNATE BID TOTAL**

$
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)
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:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MATERIAL</th>
<th>SUPPLIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Main (PVC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storm Sewer (PVC / RCP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manholes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inlets / Catch Basins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anodized Aluminum Light Poles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting Control Cabinet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>PORTION OF WORK</th>
<th>BUSINESS NAME</th>
<th>BUSINESS ADDRESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalitic Paving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical / Lighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restoration / Landscaping</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.


(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
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)                          (WITNESS)
___________________________________    _________________________________
(CONTRACTOR)    (SEAL)                (TITLE)
BY:________________________________
___________________________________    _________________________________
(TITLE)                                    (TITLE)
BY:________________________________
___________________________________    _________________________________
CITY OF DE PERE    (SEAL)             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)
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)
APPLICATION FOR PAYMENT

Change Order Summary

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

NET CHANGE BY CHANGE ORDERS: $0.00

CONTRACTOR’S CERTIFICATION

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

By: ___________________________ Date: ________________

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

is recommended by: ___________________________ (Contractor) (Date)

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

is recommended by: ___________________________ (Owner) (Date)
SECTION 00 65 16
CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Project 19-18
Owner: City of De Pere
Prosper Street and Enterprise Drive Reconstruction and Utility Relay

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
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

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 its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from the publication source and make them available on request.

1.3 WORK COVERED BY THE CONTRACT DOCUMENTS

A. Project Identification
   1. Project Location
      a. 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.
   10. Storm sewer inlet and inlet lead removal and replacement.
   12. Temporary water main connection.
   13. Pavement marking.

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.

<table>
<thead>
<tr>
<th>Address</th>
<th>Water Laterals</th>
<th>Sanitary Sewer Laterals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900 Enterprise Drive</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>801 Prosper Street</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>809 Prosper Street</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>815 Prosper Street</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>825 Prosper Street</td>
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<td>1</td>
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<tr>
<td>830 Prosper Street</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>845 Prosper Street</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>850 Prosper Street</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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@tdstelcom.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:

1. Sanitary Sewer Laterals
2. Sanitary Sewer Service Branches
3. Dig Down to Verify Lateral Material and Size

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.
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:
   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:
   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:
   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:

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.
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:
   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:
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:
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.
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:
   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
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.
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:
   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.
   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:
   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.
   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:
   2. Pipe and fittings of material stated in the Unit Price Bid Schedule.
   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:
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:
   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.
   7. Connection to existing water service (where required).
   8. Installation of curb stops and curb boxes.

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:
   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:
   2. Fire hydrant complete of the specified bury depth.
   4. Hydrant wrenches.
   5. Hydrant markers.
   6. Polyethylene encasement.
   7. Drainage pit.
   8. Disinfection of hydrant.
   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:
   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:
   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:
   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 APPURTENANCES

A. The unit price for Abandon/Remove Water Main and Appurtenances work includes:
   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.
   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
MEASUREMENT AND PAYMENT STREET AND DRAINAGE CONSTRUCTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Unclassified Excavation. SD-01
2. Crushed Aggregate Base and Surface Course SD-02
3. Asphalitic 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:
   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:
   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:
   2. Asphaltic concrete mixture, tack coat and other required materials
   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:
   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.
   7. Provide crushed aggregate base.
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:
   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:
   2. Furnish all labor, tools, equipment and services.
   3. Providing Portland cement concrete mixture of thickness shown in the drawings or specified elsewhere.
   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.
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:
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.
10. Sidewalk steps.
11. Saw cutting adjacent surfaces.
12. Finishing.
13. Protection.

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

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

1.10 DEFORMED REINFORCEMENT BARS

A. The unit price for Deformed Reinforcement Bars work includes:
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:
   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:
   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 provided by the Engineer.
   7. Regulatory requirements.
   8. Quality assurance and quality control testing and inspections.
   9. Shop drawings and other submittals.

1.3 PIPE FOUNDATION STABILIZATION

A. The unit price for Pipe Foundation Stabilization work includes:
   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” plus 1:1 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:
   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:
   2. Install to the dimensions as shown on the drawing or specified elsewhere.
   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:
   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.

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:
   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.

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:
   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:
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:
   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:
   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:
   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:
   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:
   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:
   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:
   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:
   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:
   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:
   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:
   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
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.
   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
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
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
PART 1 – GENERAL

1.1 SUMMARY

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

1.2 SUBMITTALS

A. None

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 PREPARATION

A. Investigate and verify the existence and location of site improvements, utilities, and other existing facilities.

B. Before construction, verify the location of invert elevations at points of connection of sanitary sewer, storm sewer, water piping and underground electrical services.

C. Furnish information to the Engineer and the appropriate utility regarding conflicts that are necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction.

D. Provide the Engineer two 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
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
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.

B. LUMINAIRE MATERIALS
   1. General Requirements:
      (a) The luminaire manufacturer shall have produced LED street lighting luminaries for a minimum of 3 years at the time of bid.
      (b) Proposed products must be available, in full production, at the time of this project. Prototypes and conceptual products will not be accepted.
      (c) The manufacturer shall provide a warranty for 10 years (beginning on the date of substantial completion) for full replacement of fixture for catastrophic failure, or light levels below 70% of initially documented values excluding labor, tools, and miscellaneous materials with the following exception: Any documented light fixture failures exceeding 5% of the initial installed number of fixtures within the first 5 years shall afford the Owner the right to full replacement (including all necessary tools, labor, materials, traffic control, and incidentals necessary to bring the lighting system back to a complete and operable system). The luminaire shall have a minimum 10 year warranty covering the entire luminaire (electronics, mechanical, finish). Knockdowns by the general public are excluded from manufacturer’s responsibility. The warranty will begin on the date of substantial completion.

   2. Mechanical Requirements:
      (a) Luminaire housing shall be made of cast or extruded aluminum, with low copper (<0.3%) alloys.
      (b) Heat sinking for the LEDs and electrical components shall be integral to the housing, with no moving or active parts (it should be a passive heat sink). It
shall be shaped to maximize heat movement, and designed so that dirt and debris will not accumulate between fins or channels.

(c) The luminaire shall include protection to keep birds from entering the housing.
(d) There shall be a four-bolt mounting system accommodating 1.66” to 2.38” OD tenons. The housing shall be designed to allow installations at a tilt angle of +/- 5 degrees.
(e) The luminaire shall have a minimum of 2G vibration rating per ANSI 136C.31. Situations requiring a 3G rating include bridges and overpasses.
(f) The luminaire shall not weigh more than 40 pounds.
(g) The luminaire shall operate in ambient temperatures of -40°C (-40°F) to +40°C (104°F).
(h) The factory finish shall match the pole and may be anodized instead of painted. The finish must withstand extreme weather changes without cracking or peeling and be guaranteed for five full years or more.

3. LED (Light Source) Requirements:
   (a) The LEDs shall be from Cree, Phillips Lumileds, Nichia, or Osram.
   (b) The LED package shall be tested for a minimum of 6000 hours per IES LM-80-08.
   (c) The LEDs shall have a nominal correlated color temperature (CCT) between 4000 - 4500K.
   (d) The LEDs shall have a minimum color rendering index (CRI) of 70.
   (e) The projected L70 lifetime (the point in time at which the LEDs are expected to produce only 70% of their lumen output) for the luminaire shall be a minimum of 60,000 hours at 25° C.

4. Photometric Requirements:
   (a) The luminaire optics shall be available with IES Type II and III distributions.
   (b) Provide IES TM -15-07 optical precision for backlight, up light, and forward light (glare).
   (c) The luminaire shall deliver 65 lumens per watt (LPW) minimum at 530 mA drive current.
   (d) The optical portion of the luminaire must be protected to IP65 minimum, per ANSI C136.25, to prevent dirt and water from getting to the LED circuit board.
   (e) The luminaire shall have been photometrically tested per IES LM-79-08 by an independent laboratory, or an in-house laboratory with NIST NVLAP accreditation.

5. Electrical Requirements:
   (a) Provide all miscellaneous electrical components necessary to provide a complete and operable lighting system meeting local and National Electrical Code (NEC) requirements. All electrical components shall be UL listed for outdoor use.
   (b) Provide 120V system, Power Factor>90%, Total Harmonic Distortion<20%.
   (c) The driver shall be available with input voltages ranges from 120-277 volts. Other installations may need to be available with dimming. Indicate if the fixture is compatible to be able to reduce light output by 50% and if there is an additional cost to provide.
(d) The driver, as operated in the luminaire, must not exceed the driver manufacturer’s maximum case temperature limits for a rated life of at least 60,000 hours.
(e) The luminaire shall be protected against surges according to IEEE C62.42 C High (10kA and kV).
(f) The driver electronics shall be encapsulated and sealed to IP 65 rating. Drivers shall be easily accessible and removable without tools.
(g) The luminaire shall have a shorting cap.

2.8 LIGHTING CONTROL CABINET

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

PART 3 – EXECUTION

3.1 CONSTRUCTION METHODS LUMINARIES

A. Luminaries
1. Furnish and install luminaries and all necessary miscellaneous accessories and hardware to complete the installation of the luminaries.
2. Follow manufacturer’s instructions regarding luminaire installation.
3. Three single-conductor No. 12 stranded wired shall be used to connect the luminaries to their respective 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

## 2.1 Product

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

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<tr>
<th>Description</th>
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<tr>
<td>G. Average Luminance (cd/m²)</td>
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<td>G. Avg/min and maz/min uniformity</td>
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<td>G. Maximum Lv ratio</td>
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<tr>
<td>Power Consumption (System Watts/Pole)</td>
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<td></td>
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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
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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GENERAL COMMENTS

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 7½ 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:

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

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 sheepfoot 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 desired 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 unsuitabl e 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

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<tr>
<th>SOIL PARAMETER</th>
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<tr>
<td>AASHTO Soil Classification</td>
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<tr>
<td>Drainage</td>
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<tr>
<td>Shrink/Swell Potential</td>
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</tr>
<tr>
<td>Design Frost Index</td>
<td>F-3</td>
</tr>
<tr>
<td>Design Group Index</td>
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</tr>
<tr>
<td>Soil Support Value</td>
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</tr>
<tr>
<td>Estimated Subgrade Modulus (k)</td>
<td>125</td>
</tr>
</tbody>
</table>

**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.
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.

<table>
<thead>
<tr>
<th>Test</th>
<th>Units</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab Tensile Strength</td>
<td>N</td>
<td>750 min.</td>
</tr>
<tr>
<td>Puncture Strength</td>
<td>N</td>
<td>300 min.</td>
</tr>
<tr>
<td>Apparent Opening Size</td>
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<td>212 max.</td>
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<tr>
<td>Permittivity</td>
<td>s⁻¹</td>
<td>0.35 min.</td>
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<tr>
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<th>Values</th>
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<tr>
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<td>um</td>
<td>212 max.</td>
</tr>
<tr>
<td>Permittivity</td>
<td>s⁻¹</td>
<td>0.35 min.</td>
</tr>
</tbody>
</table>

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.

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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 sheepfoot 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.
FIGURE 1: BORING LOCATION PLAN

SCALE: SHOWN ABOVE

PROJECT NO: 0093510

PAGE 1 OF 2
### Proposed Road Reconstruction - City of De Pere
#### Enterprise Drive
De Pere, Wisconsin

#### SOIL BORING LOG: E - 1

<table>
<thead>
<tr>
<th>DEPTH (feet)</th>
<th>VISUAL SOIL CLASSIFICATION</th>
<th>GROUND SURFACE ELEVATION: 637.4</th>
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<th>Qp (tsf)</th>
<th>Qu (tsf)</th>
<th>MC (%)</th>
<th>REMARKS</th>
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<td>END OF BORING @ 9± FEET</td>
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#### FIELD OBSERVATIONS
- Water Level during drilling: Not Encountered
- Water Level upon completion: Not Present
- Caved at upon completion: 7± feet below existing grade (EL. 630.4±)  ↓
- Delay Time: N/A
- Water Level during completion: N/A
- Caved at completion: 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

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<th>DEPTH/EL. (feet)</th>
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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 at end: N/A

ADDITIONAL COMMENTS:
- Notes: 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

### Drilled By:
- KD

### Logged By:
- KH

### Depth/EL. (feet)

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### 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:
- 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  
**Logged By:** KH

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

### FIELD OBSERVATIONS
- **Water Level during drilling** Not Encountered
- **Water Level upon completion** Not Present
- **Caved at upon completion** 8± feet below existing grade (EL. 630.3±)
- **Delay Time:** N/A
- **Water Level upon completion** N/A
- **Caved at completion** 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.
### Proposed Road Reconstruction - City of De Pere

**Location:** Charles Street  
De Pere, Wisconsin

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#### Soil Boring Log: C-1

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<th>DEPTH/EL. (feet)</th>
<th>VISUAL SOIL CLASSIFICATION</th>
<th>GROUND SURFACE ELEVATION:</th>
<th>SAMPLExNO.</th>
<th>N (bpf)</th>
<th>Qp (tsf)</th>
<th>Qu (tsf)</th>
<th>MC (%)</th>
<th>REMARKS</th>
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<tbody>
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<td>0-3&quot;: Asphalt</td>
<td>611.6</td>
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<td>3 609.6</td>
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**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 upon completion: N/A
- Caved at upon completion: N/A

**Additional Comments:**
- 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

**Project No.:** 0093510

**Location:** Charles Street
De Pere, Wisconsin

**Logged By:** KH

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**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±)

**ADDITIONAL COMMENTS:**

- Delay Time: N/A
- Water Level at completion: N/A
- Caved at completion: N/A

**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.
**Project:** Proposed Road Reconstruction - City of De Pere  
**Location:** Charles Street  
De Pere, Wisconsin  
**Project No.:** 0093510  
**Drill Date:** 12/11/2017  
**Logged By:** KH

### SOIL BORING LOG: C - 3

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<th>SAMPLE NO. (bpf)</th>
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<th>Qu (tsf)</th>
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<th>REMARKS</th>
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**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 after completion: N/A
- Caved at after completion: 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.*
<table>
<thead>
<tr>
<th>DEPTH/EL. (feet)</th>
<th>VISUAL SOIL CLASSIFICATION</th>
<th>GROUND SURFACE ELEVATION: 612.8</th>
<th>SAMPLE NO.</th>
<th>N (bpf)</th>
<th>Qp (tsf)</th>
<th>Qu (tsf)</th>
<th>MC (%)</th>
<th>REMARKS</th>
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</tbody>
</table>

FIELD OBSERVATIONS
- Water Level during drilling: Not Encountered
- Water Level at completion: Not Present
- Caved at completion: 4± feet below existing grade (EL. 608.8±)

ADDITIONAL COMMENTS:
- Delay Time: N/A
- Water Level at delayed N/A
- Caved at delayed N/A

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

<table>
<thead>
<tr>
<th>DEPTH/EL. (feet)</th>
<th>VISUAL SOIL CLASSIFICATION</th>
<th>GROUND SURFACE ELEVATION: 614.3</th>
<th>SAMPLE NO.</th>
<th>N (bpf)</th>
<th>Qp (tsf)</th>
<th>Qu (tsf)</th>
<th>MC (%)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 613.3</td>
<td>0-6&quot;: Asphalt</td>
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<td>1-SS</td>
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<td>-</td>
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</tr>
<tr>
<td>2 612.3</td>
<td>6-9&quot;: Brown CRUSHED STONE, with trace sand, moist</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 611.3</td>
<td>Reddish brown CLAY, with trace sand and gravel, moist</td>
<td></td>
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</tr>
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<td>4 610.3</td>
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<td>15 599.3</td>
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</tbody>
</table>

**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. 600.8±)  
Delay Time: N/A  
Water Level caved upon completion: 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 - 6

**Project:** Proposed Road Reconstruction - City of De Pere  
**Project No.:** 0093510  
**Location:** Charles Street, De Pere, Wisconsin  
**Drill Date:** 12/12/2017  
**Logged By:** KH

### DEPTH/EL. (feet) | VISUAL SOIL CLASSIFICATION  
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<tr>
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<td>24</td>
<td>606.1</td>
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<tr>
<td>25</td>
<td>605.1</td>
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</tbody>
</table>

### FIELD OBSERVATIONS:
- Water Level during drilling: Not Encountered
- Water Level upon completion: Not Present
- Caved at completion: 23.5± feet below ground surface (EL. 606.6±)
- Delay Time: N/A
- Water Level upon completion: N/A
- Caved at completion: 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.
Grain Size Distribution Report

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer</th>
<th>Specified Gradation*</th>
<th>Pass? (X=No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>86.7</td>
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<tr>
<td>#200</td>
<td>19.2</td>
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</tbody>
</table>

Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits: PL = , LL = , PI =

Coefficients: 
- $D_{60} = 9.00$
- $D_{10} = 1.59$
- $D_{30} = 2.80$
- $D_{15} = 0.31$

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

Remarks:

* No specification provided

CLIENT: City of De Pere
SAMPLE NO: C-1 through C-3
PROJECT: City of De Pere Roads
SAMPLE SOURCE: Charles Street
PROJECT NO: 510
PROPOSED USE: Base Course
EL./DEPTH: 0-1"
Grain Size Distribution Report

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer</th>
<th>Specified Gradation*</th>
<th>Pass? (X=No)</th>
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</tr>
<tr>
<td>#200</td>
<td>35.0</td>
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</tr>
</tbody>
</table>

Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits: PL = LL = PI =

Coefficients: D₉₀ = 5.46 D₆₀ = 1.43 D₅₀ = 0.67
D₃₀ = D₁₅ = D₁₀ =
Cᵥ = Cₑ =

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

Remarks:

* No specification provided

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
Grain Size Distribution Report

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer</th>
<th>Specified Gradation*</th>
<th>Pass? (X=No)</th>
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<tbody>
<tr>
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<tr>
<td>#4</td>
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<tr>
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<tr>
<td>#200</td>
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</table>

Soil Description: Reddish brown LEAN CLAY, with trace sand

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

Coefficients:

$D_{85} = D_{60} = D_{50} = \text{Cu} = \text{Cc} =$

Classifications: USCS = CL  AASHTO = A-6

Remarks:

* No specification provided

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
Soil Description: Grayish brown SILTY SAND, with gravel

Atterberg Limits:  
PL =  
LL =  
PI =  

Coefficients:  
\( D_{60} = 5.74 \)  
\( D_{60} = 1.39 \)  
\( D_{50} = 0.56 \)  
\( D_{30} = \)  
\( D_{15} = \)  
\( D_{10} = \)  
\( C_c = \)  
\( C_s = \)  

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

Remarks:

% Gravel (≥ 3") | % Coarse | % Medium | % Finer | % Total
--- | --- | --- | --- | ---
40.3 | 48.4 | 40.3 | 128.1
67.3 | 48.4 | 40.3 | 158.0
94.2 | 82.6 | 40.3 | 157.1

* No specification provided

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer</th>
<th>Specified Gradation*</th>
<th>Pass? (X=No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot;</td>
<td>94.2</td>
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<td>#4</td>
<td>82.6</td>
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</tr>
<tr>
<td>#200</td>
<td>34.1</td>
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CLIENT: City of De Pere  
SAMPLE NO: E-2 and E-4  
PROJECT: City of De Pere Roads  
SAMPLE SOURCE: Enterprise Drive  
PROJECT NO: 510  
PROPOSED USE: Base Course  
DATE: 12/22/2017  
EL./DEPTH: 0-1"  
SAMPLED BY: KD  
QA/QC By: CW

Tested By: KD
Soil Description: Reddish brown LEAN CLAY, with sand

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

Coefficients: 
- \( D_{60} = 0.10 \)
- \( D_{40} = \)
- \( D_{10} = \)
- \( C_{c} = \)
- \( C_{u} = \)

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

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<tr>
<th>U.S. Std. Sieve</th>
<th>#200</th>
<th>#40</th>
<th>#10</th>
<th>#4</th>
<th>⅜&quot;</th>
<th>3&quot;</th>
<th>12&quot;</th>
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<tbody>
<tr>
<td>Soil Type</td>
<td>Clay</td>
<td>Silt</td>
<td>Sand</td>
<td>Gravel</td>
<td>Cobble</td>
<td>Boulders</td>
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<tr>
<td>Millimeters</td>
<td>0.002</td>
<td>0.074</td>
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</table>

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487-00)

Criteria for assigning group symbols and group names using laboratory tests:

<table>
<thead>
<tr>
<th>Group Symbol</th>
<th>Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW</td>
<td>Well-graded gravel</td>
</tr>
<tr>
<td>GP</td>
<td>Poorly graded gravel</td>
</tr>
<tr>
<td>GM</td>
<td>Silty gravel</td>
</tr>
<tr>
<td>GC</td>
<td>Clayey gravel</td>
</tr>
<tr>
<td>SW</td>
<td>Well-graded sand</td>
</tr>
<tr>
<td>SP</td>
<td>Poorly graded sand</td>
</tr>
<tr>
<td>SM</td>
<td>Silty sand</td>
</tr>
<tr>
<td>SC</td>
<td>Clayey sand</td>
</tr>
</tbody>
</table>

RELATIVE SOIL COMPOSITION

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

Professional Service Industries, Inc.
DRILLING & SAMPLING SYMBOLS

AU - Auger sample from cuttings
CS - Continuous ampler
HA - Hand auger sample
SS - Split spoon sample (2” O.D. by 1½” 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)

N-value Range | Approximate N-value Range
---|---
0 - 2 | 0 - 2
0 - 0.25 | 2 - 5
0.25 - 0.5 | 5 - 10
0.5 - 1.0 | 10 - 14
1.0 - 2.0 | 14 - 32
2.0 - 4.0 | 32+
4.0+ |

SOIL RELATIVE DENSITY & CONSISTENCY CLASSIFICATION

<table>
<thead>
<tr>
<th>NON-COHESIVE SOILS</th>
<th>COHESIVE SOILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>N-Value Range</td>
</tr>
<tr>
<td>Very loose</td>
<td>0 - 3</td>
</tr>
<tr>
<td>Loose</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Medium dense</td>
<td>7 - 15</td>
</tr>
<tr>
<td>Dense</td>
<td>15 - 38</td>
</tr>
<tr>
<td>Very dense</td>
<td>38+</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

• - 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).”
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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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)
Figure 3.3.2 Soil Survey Information (College Avenue)

Figure 3.3.3 Soil Survey Information (James Street)

Figure 3.3.4 Soil Survey Information (Prosper Street)
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>
<thead>
<tr>
<th>Approximate Depth Range (feet)</th>
<th>Strata</th>
<th>Description</th>
<th>SPT(1) N-value Range (bpf)</th>
<th>Unconfined Compressive Strength(2) (tsf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>--</td>
<td>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.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2 - 5½</td>
<td>I</td>
<td>FILL: lean clay (CL), silty clay (CL-ML) and sandy silty clay (CL-ML) with organics, medium stiff to stiff</td>
<td>5 - 10</td>
<td>N/A</td>
</tr>
<tr>
<td>10 - 23</td>
<td>II</td>
<td>Lacustrine: lean clay (CL), fat clay (CH), silty clay (CL-ML) and silt (ML), very soft to very stiff</td>
<td>2 - 27</td>
<td>0.25 - 5.5</td>
</tr>
</tbody>
</table>

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 1¾-inch inside diameter, the soil classifications noted on the boring logs may not be representative of the entire soil matrix. Materials larger than the 1¾-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

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

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 sheepfoot 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>
<thead>
<tr>
<th>Location</th>
<th>Frequency of Tests</th>
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</thead>
<tbody>
<tr>
<td>Pavement Areas</td>
<td>1 test per 10,000 sq. ft.</td>
</tr>
<tr>
<td>Other Non-Critical Areas</td>
<td>1 test per 10,000 sq. ft.</td>
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</tbody>
</table>

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>
<thead>
<tr>
<th>Location</th>
<th>Frequency of Tests</th>
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<tbody>
<tr>
<td>Pavement Areas</td>
<td>1 test per 10,000 sq. ft. per lift</td>
</tr>
<tr>
<td>Utility Trenches</td>
<td>1 test per 200 linear ft. per lift</td>
</tr>
<tr>
<td>All Other Non-Critical Areas</td>
<td>1 test per 10,000 sq. ft. per lift</td>
</tr>
</tbody>
</table>

**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
Legend

Approximate Boring Locations

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
APPENDIX B – Field Operations

Reference Notes for Boring Logs
Test Boring Log 1 through 11
Soil and Site Evaluation – Storm
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.
**Garrity's Glen South**

**Topsoil Thickness [6"]**

- **S-1**: SS 24 4 - (CL) [A-6] Lacustrine, LEAN CLAY WITH SAND AND SEAMS OF SILT, brown, moist, medium stiff to stiff
- **S-2**: SS 24 9
- **S-3**: SS 24 15 - (CL) [A-6] Lacustrine, LEAN CLAY WITH SAND, brown, moist, very stiff to stiff to very stiff
- **S-4**: SS 18 10
- **S-5**: SS 18 11
- **S-6**: SS 18 6
- **S-7**: SS 18 15
- **S-8**: SS 18 12 - (CL/ML) [A-4] Lacustrine, SILTY CLAY, very dark brown, moist, very stiff
- **S-9**: SS 24 17

**END OF BORING @ 23’**

---

**Additional info.**

- **S-1**: SS 24 4 - Topsoil Thickness [6”]
- **S-2**: SS 24 9
- **S-3**: SS 24 15 - (CL) [A-6] Lacustrine, LEAN CLAY WITH SAND AND SEAMS OF SILT, brown, moist, medium stiff to stiff
- **S-4**: SS 18 10
- **S-5**: SS 18 11
- **S-6**: SS 18 6
- **S-7**: SS 18 15
- **S-8**: SS 18 12 - (CL/ML) [A-4] Lacustrine, SILTY CLAY, very dark brown, moist, very stiff
- **S-9**: SS 24 17

---

- **Boring started**: 11/26/18
- **Boring completed**: 11/26/18
- **Drilling method**: 3 1/4” HSA 0’ to 23’ (AH)

---

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

---

- **WL (BCR)**: None
- **WL (ACR)**: None
- **Boring started**: 11/26/18
- **Boring completed**: 11/26/18
- **Cave in depth**: None

---

- **Rig**: ATV
- **Foreman**: GB/BB

---

**TOPSOIL THICKNESS**

- **Topsoil**: [6”]

---

**SITE LOCATION**

- **Various Streets, De Pere, Brown County, Wisconsin**

---

**PROJECT NAME**

- **2019 Construction Design**
### Stratification Details

The stratification lines represent the approximate boundary lines between soil types. In situ, the transition may be gradual.

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Sample No.</th>
<th>Sample Type</th>
<th>Sample Dist. (in)</th>
<th>Recovery (in)</th>
<th>Surface Elevation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
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<td>10</td>
<td>S-3</td>
<td>SS</td>
<td>24</td>
<td>18</td>
<td>Not Indicated</td>
</tr>
<tr>
<td>15</td>
<td>S-4</td>
<td>SS</td>
<td>18</td>
<td>17</td>
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</tr>
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<td>20</td>
<td>S-5</td>
<td>SS</td>
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<td>20</td>
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</tr>
<tr>
<td>20</td>
<td>S-7</td>
<td>SS</td>
<td>18</td>
<td>18</td>
<td>Not Indicated</td>
</tr>
<tr>
<td>20</td>
<td>S-8</td>
<td>SS</td>
<td>18</td>
<td>15</td>
<td>Not Indicated</td>
</tr>
</tbody>
</table>

**Description of Material**
- **Topsoil Thickness [8"]**
- (CL) [A-6] Fill, Lean Clay With Sand and Silt, dark brown, moist, medium stiff
- (CL) [A-6] Lacustrine, Lean Clay With Sand, brown, moist, stiff
- (CL) [A-6] Lacustrine, Lean Clay With Sand, dark brown, moist, medium stiff to stiff

**Sample Dist.**

**Recovery (in)**

**Surface Elevation**

**Not Indicated**

---

**Additional Information**

**Client:** City of De Pere  
**Job #:** 1549  
**Boring #:** 2  
**Sheet:** 1 OF 1  

**Boring Details**

- **Boring Started:** 11/26/18  
- **Boring Completed:** 11/26/18  
- **Drilling Method:** 3 1/4" HSA 0' to 20' (AH)
Various Streets, De Pere, Brown County, Wisconsin

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’
**Topsoil Thickness [8"]**

- **S-1**: (CL) [A-6] Fill, Lean Clay with Sand, brown, moist, medium stiff
- **S-2**: (CL) [A-6] Lacustrine, Lean Clay with Sand, brown, moist to wet, stiff to medium stiff to stiff

---

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

---

**Additional info.**

- **Station + Offset:**
  - W L
  - N one
  - W S
  - W D
- **Boring Started:** 11/26/18
- **Boring Completed:** 11/26/18
- **Cave In Depth:**
  - WL
  - Boring: 18 feet
  - Calibrated Penetrometer Tons/ft²
    - 1: 7.0
    - 2: 3.5
    - 3: 1.8
    - 4: 0.9
    - 5: 0.9
- **Drilling Method:** 3 1/4" HSA 0' to 20' (AH)

---

**SITE LOCATION**

Various Streets, De Pere, Brown County, Wisconsin

**PROJECT NAME**

2019 Construction Design

**ARCHITECT-ENGINEER**

Client: City of De Pere

Job #: 1549

Boring #: 4

Sheet: 1 OF 1
**Asphalt Thickness [3.5"]**
Gravel Thickness [14"]

**College Avenue**

<table>
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<tr>
<th>DEPTH (FT)</th>
<th>SAMPLE NO.</th>
<th>SAMPLE TYPE</th>
<th>SAMPLE DIST. (IN)</th>
<th>DESCRIPTION OF MATERIAL</th>
<th>ENGLISH UNITS</th>
<th>BOTTOM OF CASING</th>
<th>LOSS OF CIRCULATION</th>
<th>SURFACE ELEVATION</th>
<th>WATER LEVELS</th>
<th>ELEVATION (FT)</th>
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<tbody>
<tr>
<td>0</td>
<td>S-1</td>
<td>SS</td>
<td>18</td>
<td>(CL/ML) (A-4) FILL, SANDY SILTY CLAY WITH ORGANICS, very dark brown, moist, medium stiff</td>
<td></td>
<td></td>
<td></td>
<td>Not Indicated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>S-2</td>
<td>SS</td>
<td>18</td>
<td>(CL) (A-6) Lacustrine, LEAN CLAY WITH SAND, brown, moist, medium stiff to very stiff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-3</td>
<td>SS</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S-4</td>
<td>SS</td>
<td>18</td>
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<td></td>
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</tr>
<tr>
<td>10</td>
<td>S-5</td>
<td>SS</td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
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</table>

**END OF BORING @ 10’**

**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)
The stratification lines represent the approximate boundary lines between soil types. In situ the transition may be gradual.

Asphalt Thickness [4”]
Gravel Thickness [3”]

(CL/ML) (A-4) FILL, SILTY CLAY WITH SAND, trace Organics, very dark brown, moist, medium stiff

(CL) (A-6) Lacustrine, LEAN CLAY WITH SAND AND SEAMS OF SILT, trace gravel, brown with gray, moist, medium stiff to very stiff

END OF BORING @ 10’
Asphalt Thickness [6"]
Pulverized Asphalt Thickness [5.5”]
Gravel Thickness [11.5”]

(CL) (A-6) FILL, LEAN CLAY WITH POCKETS OF SAND, brown, moist, medium stiff to stiff

(CL) (A-6) Lacustrine, LEAN CLAY WITH SAND, brown, moist to wet, stiff

(CH) (A-7-6) Lacustrine, FAT CLAY, brown, wet, very soft

END OF BORING @ 15’
The stratification lines represent the approximate boundary lines between soil types. In situ the transition may be gradual.

### Additional Info.

**Proper Street**

<table>
<thead>
<tr>
<th>Station+Offset</th>
<th>Water Levels Elevation (ft)</th>
<th>Boring Started</th>
<th>Boring Completed</th>
<th>Cave in Depth</th>
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<tr>
<td></td>
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<td>11/27/18</td>
<td>11/27/18</td>
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</tr>
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**Client:** City of De Pere  
**Job #:** 1549  
**Boring #:** 8  
**Sheet:** 1 OF 1  
**Project Name:** 2019 Construction Design  
**Architect-Engineer:** ECS  
**Site Location:** Various Streets, De Pere, Brown County, Wisconsin  
**Additional Info:** Prosper Street  
**Site Location:** Various Streets, De Pere, Brown County, Wisconsin  
**Additional Info:** Prosper Street

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<th>Sample No.</th>
<th>Sample Type</th>
<th>Sample Dist. (In)</th>
<th>Recovery (In)</th>
<th>Surface Elevation</th>
<th>Description of Material</th>
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<td>Gravel Thickness 9&quot;</td>
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<tr>
<td>S-3</td>
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<td>13</td>
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<td>(CL) (A-6) Fill, Lean Clay with Sand, dark brown, moist, stiff</td>
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<td>6</td>
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<td>(CL) (A-6) Lacustrine, Lean Clay with Sand, brown, moist, stiff to very stiff</td>
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<tr>
<td>S-5</td>
<td>SS</td>
<td>18</td>
<td>15</td>
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<td></td>
</tr>
</tbody>
</table>

**END OF BORING @ 10'**
Concrete Thickness [8”]
Gravel Thickness [10”]

(CL) (A-6) Lacustrine, LEAN CLAY WITH SAND AND GRAVEL, brown, moist, stiff

(CL) (A-6) Lacustrine, LEAN CLAY WITH SAND, dark brown, moist, stiff to very stiff

The stratification lines represent the approximate boundary lines between soil types. In situ the transition may be gradual.

WL None
WL (BCR) None
WL (ACR) None
WL

RIG ATV
FOREMAN GB/BB
DRILLING METHOD 3 1/4’ HSA 0’ to 10’ (AH)
### Site Location

**Various Streets, De Pere, Brown County, Wisconsin**

### Additional Info.

**Ryan Road**

### Depth (ft)

<table>
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<th>Sample No.</th>
<th>Sample Type</th>
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<th>Recovery (in)</th>
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<td></td>
<td>Gravel Thickness [14&quot;]</td>
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<td>SS</td>
<td>18 5</td>
<td></td>
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<tr>
<td>S-3</td>
<td>SS</td>
<td>18 5</td>
<td></td>
<td>(CL) [A-6] Lacustrine, LEAN CLAY WITH SAND, trace gravel, brown, moist, stiff to very stiff</td>
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<td>S-4</td>
<td>SS</td>
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<td></td>
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<tr>
<td>S-5</td>
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<td>S-6</td>
<td>SS</td>
<td>18 15</td>
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<td>S-7</td>
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<td>18 2</td>
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<tr>
<td>S-8</td>
<td>SS</td>
<td>24 18</td>
<td></td>
<td></td>
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</table>

### End of Boring @ 18'

---

**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:** None  
**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)
Asphalt Thickness [2.5"
(CL) [A-6] Lacustrine, LEAN CLAY WITH SAND, brown, moist, medium stiff to very stiff
NOTE: 2 inch layer of Silt encountered beneath Gravel Base Course.

END OF BORING @ 17'
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)].

<table>
<thead>
<tr>
<th>County</th>
<th>Brown</th>
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<tbody>
<tr>
<td>Parcel I.D.</td>
<td>WD-L484</td>
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Reviewed by: M King / M Meyer

Date: 12/3/18

SOIL AND SITE EVALUATION – STORM

Property Owner:
R&M Garrity Farm, LLC ETAL

Property Owner’s Mail Address:
3173 Trenton Lane

**Property Location**

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
<th>Phone Number</th>
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<tbody>
<tr>
<td>Green Bay</td>
<td>WI</td>
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**City**

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<th>Govt. Lot</th>
<th>SW¼</th>
<th>SW½</th>
<th>S6</th>
<th>T22</th>
<th>N</th>
<th>R20</th>
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<td>□</td>
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<td></td>
<td></td>
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</table>

**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**

- □ Double Ring Infiltrometer
- □ Other: (specify)

**Soil Moisture**

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

**Comments:**

<table>
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<tr>
<th>#OBS.</th>
<th>Pit</th>
<th>Boring</th>
<th>Ground surface elevation</th>
<th>ft.</th>
<th>Elevation of limiting factor</th>
<th>ft.</th>
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<tbody>
<tr>
<td>A</td>
<td>0 – 8</td>
<td>7.5 YR 4/3</td>
<td>No Redox Features</td>
<td>c</td>
<td>0, cdy</td>
<td>fr</td>
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<tr>
<td>C</td>
<td>8 – 60</td>
<td>7.5 YR 4/4</td>
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<td>1, f, abk</td>
<td>fi</td>
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<tr>
<td>C</td>
<td>60 – 240</td>
<td>7.5 YR 4/3</td>
<td>No Redox Features</td>
<td>c</td>
<td>1, f, abk</td>
<td>fi</td>
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</table>

Comments:

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<td>---</td>
<td>8 – 36</td>
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<td>No Redox Features</td>
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<td>0, cdy</td>
<td>fr</td>
</tr>
<tr>
<td>C</td>
<td>36 – 240</td>
<td>7.5 YR 4/3</td>
<td>No Redox Features</td>
<td>c</td>
<td>1, f, abk</td>
<td>fi</td>
</tr>
</tbody>
</table>

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 if 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 overly rely 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 engine 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 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 Geotechnical Engineer for Additional Assistance

Membership in the Geoprocessing Business Association exposes geotechnical engineers to a wide array of risk mitigation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBA-member geotechnical engineer for more information.
NOTES:
1. SAMPLING ALL WATERS PONTS AT ODEWAYS.
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 SEWERS BEFORE START OF WATER MAIN WORK.
CITY OF DE PERE

ENTERPRISE DRIVE

CROSS SECTIONS
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 FEATURES (E.G., MANHOLE AND INLINES) IN THE PAVEMENT STRUCTURE WHEN POSSIBLE.

WATER VALVES DO NOT REQUIRE JOINT ADJUSTMENT.

AVOID SLABS LESS THAN 6 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 87° BY DOUBLING 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 DOUBLE EXPANSION JOINT ON THE SIDE ROAD OF AN INTERSECTION IF THE SIDE ROAD IS CONCRETE PAVEMENT AND GREATER THAN 90 FEET IN LENGTH; ALIGN EXPANSION JOINT WITHIN 10 FEET OF RADIX.

3. THE ENGINEER MAY APPROVE SLIGHT VARIATIONS FROM THESE JOINTING DETAILS.

CONCRETE PAVEMENT JOINTING

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
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 AND JOINT EDGE OF MANHOLE IS 0 FEET OR LESS, DIVERT THE LONGITUDINAL JOINT AT A 45 DEGREE ANGLE TO THE CENTER OF THE MANHOLE. IF THE DISTANCE IS GREATER THAN 3 FEET, DO NOT DIVERT THE JOINT AND SEAL AS NORMAL. PLACE REINFORCEMENT BEAMS AROUND THE MANHOLE.

4. IF THE DISTANCE FROM THE EDGE OF THE MANHOLE TO THE NEAREST TRANSVERSE JOINT IS LESS THAN 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 SEAL AS NORMAL. PLACE REINFORCEMENT BEAMS AROUND THE MANHOLE.

5. ALIGN TRANSVERSE JOINT WITH ONE EDGE OF INLET WHEN PRACTICAL.

CONCRETE PAVEMENT JOINTING AT UTILITY FIXTURES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
Si. Date
Pavement Supervisor

CITY OF DE PERE
ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115
OFFICE 920-335-4491 FAX 920-335-4071

ENTERPRISE DRIVE & PROSPER STREET
CONSTRUCTION DETAILS

SDD 13c18-d Concrete Pavement Jointing at Utility Fixtures
GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND BARRIACADES 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.

BARRIACADES 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 PORTABLE SUPPORTS.

ALL TYPE III BARRIACADES SHALL HAVE RAILS REFLECTORIZED ON BOTH SIDES. STRIPES SHALL BE PROPERLY SUPERIMPOSED TOWARD THE TRAFFIC SIDE OR AS SHOWN IN THE ROAD CLOSURE BARRIACADE DETAIL "D" FOR FULL ROAD CLOSURES.

TYPE IV LOW INTENSITY FLASHING WARNING LIGHTS SHALL BE VISIBLE ON BOTH SIDES OF THE BARRIACADE.

THE R11 - 2, R11 - 3, M4 - 3, R11 - 4, AND R15 - 64 SIGNS PLACED ON THE BARRIACADES SHALL COVER NO MORE THAN THE TOP RAIL. THE SIGNS SHALL NOT COVER ANY PORTION OF THE MIDDLE RAIL OR BOTTOM RAILS.

“W0” AND “M0” 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 36"
R11 - 3 SHALL BE 36" X 36"
R11 - 4 AND R15 - 61 SHALL BE 60" X 30"
M4 - 3 SHALL BE 24" X 12" (28" X 12" IF NEEDED TO MATCH EXISTING SIGNS)
M3 - X SHALL BE 24" X 12" (28" X 12" IF NEEDED TO MATCH EXISTING SIGNS)
R21 - 1 AND R15 - 62 SHALL BE 30" X 30" (35" X 35" IF NEEDED TO MATCH EXISTING SIGNS)
MO1 - 1 AND MO2 - 1 SHALL BE 24" X 24" (28" X 28" 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"

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

THESE SIGNS AND BARRIACADES ARE NOT REQUIRED IF ROAD CLOSURE BEGINS AT AN INTERSECTION.

FOR ROAD CLOSURE WITHOUT LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRIACADE DETAIL "D".

FOR ROAD CLOSURE WITH LOCAL ACCESS TO PROJECT, SEE ROAD CLOSURE BARRIACADE DETAIL "E".

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

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, USE 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.

"EAST" CARDINAL DIRECTION WARNERS AND RIGHT TURN ARROWS ARE SHOWN. USE OTHER CARDINAL DIRECTIONS AND ARROWS AS APPROPRIATE.

SEE SDD 15C2 - SHEET "a" FOR LEGEND
GENERAL NOTES

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

FOUR (4) BOLTS SHALL BE FURNISHED WITH EACH TRANSFORMER BASE. BOLTS SHALL BE 1/2" DIAMETER, 4" IN LENGTH, WITH WASHERS. LOCK WASHERS AND NUTS. BOLTS
NUTS AND WASHERS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION G46,2.2
OF THE SPECIFICATIONS.

LEVELING SHIMS, IF NEEDED, SHALL BE DESIGNED FOR THE PURPOSE AND USED
UNDER CASE 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 COMPETE COVER THE AREA UNDER
THE LENGTH AND WIDTH OF THE BASE MOUNTING FLANGE.

DOUBLE NUTTING IS NOT ACCEPTABLE FOR LEVELING OR MOUNTING PURPOSES.

A NEUTRAL, APPROVED, LISTED, COPPER WITH BRASS OR STAINLESS STEEL
SET SCREW, DIRECT BURY RATED. MECHANICAL CONNECTOR LUGS USED TO
FURNISH AND INSTALL THE PEDESTAL AND TRANSFORMER BASE.

THE MECHANICAL CONNECTOR SHALL BE INSTALLED USING A 1/4" - 20 TPI STAINLESS
STEEL HEX HEAD BOLT OF SUFFICIENT LENGTH TO FULLY 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.

TRANSFORMER 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 0.5", THEN TIGHTENING
TO A POINT OF BEING IMMOVABLE.

THE ACCESS DOOR SHALL BE OF THE SAME MATERIAL AS THE BASE.

TYPICAL MECHANICAL
CONNECTOR LUG
TO BE FURNISHED WITH EACH BASE.

TRANSFORMER BASE
INTENDED FOR USE WITH TYPE D, L, A, S & B POLES.

LEVELING SHIM
AS NEEDED.

PEDESTAL
BASE WASHER

TRANSFORMER/PEDESTAL BASES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
DATE
STATE ELECTRICAL ENGINEER

CITY OF DE PERE

ENGINEERING DIVISION
925 S. 6TH ST
DE PERE, WI 54115

OFFICE 920-334-4081
FAX 920-334-4074

ENTERPRISE DRIVE & PROSPER STREET
ELECTRICAL DETAILS

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.

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, CONFORM 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 CONDUITS
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.

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.

SECTION 601. POLES, OF THE STANDARD SPECIFICATIONS, SHALL APPLY TO THIS DRAWING.

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**ELECTRICAL DETAILS**

**C515 ENTERPRISE DRIVE & PROSPER STREET CITY OF DE PERE**

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**TYPE 6 POLE MOUNTING CONFIGURATION**

*(MAXIMUM LOAD)*

**LIGHTING ONLY**

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**INTERCHANGEABLE MOUNTING DETAIL**

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**POLE MOUNTINGS FOR LIGHTING UNITS, TYPE 6 (35 FEET)**

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

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**CITY OF DE PERE**

**ENGINEERING DIVISION 925 S. SIXTH ST DE PERE WI 54115**

**ENTERPRISE DRIVE & PROSPER STREET**

**ELECTRICAL DETAILS**

**NAME**

**SDD 91e-e Pole Mountings for Traffic Signals and Lighting Units Type 6 (35 feet)**

**PAGE NO.**

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**ADDRESS**

**STATE OF WISCONSIN**

**DEPARTMENT OF TRANSPORTATION**

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**SDD 09001 - 16e**

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**SDD 09001 - 16e**
GENERAL NOTES

CLAMP BOLT TIGHTENING TORQUE SHALL BE INDICATED BY INKDOT STAMPING (.012 INCH DIAMETERS AND LETTERS) OR WEATHERPROOF PRINTING ON THE INSIDE OF THE CLAMP THAT IS WELDED TO THE ARM MEMBER.

1. 4"I.D. FOR LUMINAIRE MAST ARM CLAMP. 6.50"I.D. FOR TROMBONE MAST ARM CLAMP.

2. INDIVIDUAL BASE PLATE ANCHOR ROD COVERS (A) REQUIRED.

3. BASE PLATE SLOTTED TO ACCEPT 1" THROUGH 12" BOLT CIRCLE USING 1" DIAMETER ANCHOR RODS.

4. LEVELING SHIMS, DESIGNED FOR THE PURPOSE, SHALL BE USED WHEN PLACING POLES. THE USE OF WASHERS IN THE TOP OF PROPERLY LEVELING SHIM IS NOT ACCEPTABLE. LEVELING SHIM SHAL BE USED ONLY BETWEEN THE TOP OF THE CONCRETE BASE AND A METALLIC SURFACE.

SHIMS SHALL BE LONG ENOUGH AND WIDE ENOUGH TO COMPLETELY COVER THE AREA UNDER THE LENGTH AND WIDTH OF THE BASE MOUNTING PLANGE.

TYPICAL "J" HOOK LOCATION

1/2 BOLTED HOLE, OPPOSITE DOOR (180° SIDE) IF CALLED FOR

STAINLESS STEEL HARDWARE - BOLT LENGTH FOR TROMBONE ARM CLAMPS SHALL BE A 9/16" MIN. IN LENGTH. THREAD BOLTS ENTIRE LENGTH.

STAINLESS STEEL HARDWARE - BOLT 3.75" IN LENGTH. TONGUER, LOCK WASHER AND NUT IS SETS REQUIRED PER CLAMP. THREAD BOLTS ENTIRE LENGTH.

ELECTRICAL DETAILS

SDD 9e1-g Hardware Details for Pole Mountings

ENTERPRISE DRIVE & PROSPER STREET

CITY OF DE PERE

STATE OF WISCONSIN

DEPARTMENT OF TRANSPORTATION

HARDWARE DETAILS FOR
POLE MOUNTING

STATE ELECTRICAL ENGINEER

CS16