Project Manual For

# Abel Court

Madison, WI

Prepared For:
Habitat for Humanity of Dane County
3101 Latham Drive,
Madison, WI 53713

Prepared By:
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October, 2020

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planners | engineers | advisors

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PROJECT MANUAL FOR
Abel Court
Habitat for Humanity of Dane County
Madison, WI

October, 2020
190039

Prepared By:

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Habitat for Humanity of Dane County – Abel Court, Sheets 1-15, prepared by Vierbicher, October 2020.

END OF SECTION

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INVITATION TO BID

Abel Court
Stoughton, WI

Sealed Bids for the construction of the following:

Project No. 190039

> Abel Court- Work on the Project includes the construction of Abel Court in the City of Stoughton, Wisconsin. The project includes approximately 1,000 CY of Common Excavation, 300 LF of 8" diameter sanitary sewer, 435 LF of 8" diameter D.I. Water Main, 900 Tons of Aggregate Base Course, 700 LF of Concrete Curb & Gutter, 3,525 SF of Concrete Sidewalk, 350 Tons of Hot-Mix Asphalt Pavement, restoration of the work area, and other miscellaneous items in conformance with the Contract Documents.

Bids will be received **online only** through **QuestCDN.com** until **11:00 am** local time, **September ??**, **2020** and opened privately**.**

**All Bids shall be uploaded and submitted through QuestCDN.com only**.

Complete digital Bidding Documents are available at www.vierbicher.com or www.questcdn.com. You may download the digital Bidding Documents for $30.00 by inputting **Quest project #7676625**on the website's Project Search page. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, downloading, and working with this digital project information. Please contact us at 608-524-6468 if you have any questions.

The CONTRACTOR shall be required to pay not less than the minimum wage rate as established by law.

Habitat for Humanity of Dane County reserves the right to waive any informalities and to reject any or all Bids. The letting of the work described herein is subject to the provisions of Sections 60.47, 66.0901, and 66.0903, Wisconsin Statutes.

Dated this ----------day of ----------.

Vierbicher Associates, Inc.
999 Fourier Drive, Suite 201
Madison, Wisconsin 53717

Habitat for Humanity of Dane County
3101 Latham Drive
Madison, WI 53713

END OF SECTION

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SECTION 00 21 15

INSTRUCTIONS TO BIDDERS

## 1.1 SUMMARY

A. Section Includes:
- 1.2 Defined Terms
- 1.3 Copies of Bidding Documents
- 1.4 Examination of Contract Documents and Site
- 1.5 Availability of Lands for Work, etc
- 1.6 Interpretations and Addenda
- 1.7 Contract Times
- 1.8 Liquidated Damages
- 1.9 Substitute and "Or-Equal" Items
- 1.10 Subcontractors, Suppliers, and Others
- 1.11 Bid Form
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- 1.13 Modification and Withdrawal of Bids
- 1.14 Opening of Bids
- 1.15 Bids to Remain Subject to Acceptance
- 1.16 Award of Contract
- 1.17 Contract Security
- 1.18 Signing of Agreement

B. Related Sections:
1. Section 00 11 13 – Advertisement for Bid.
2. Section 00 31 00 - Available Project Information.
3. Section 00 41 43 - Bid Form - Unit Price (Single-Prime Contract).
   a. Definitions.
   b. Contract Time identification.
   c. Tax [and duty] rebate procedures.
   d. Tax exempt procedures.
   e. Contractors fees for changes.
   f. Contractor's liability insurance.
   g. Bond types and values.

## 1.2 Defined Terms.

A. Terms used in these Instructions to Bidders which are defined in the Standard General Conditions of the Construction Contract (No. C-700) (2007 Edition) have the meanings assigned to them in the General Conditions. Certain additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof.

1. Bidder - one who submits a Bid directly to OWNER as distinct from a sub-bidder, who submits a bid to a Bidder.

2. Issuing Office - the office, identified in the Advertisement for Bid, from which

the Bidding Documents are to be issued and where the bidding procedures are to be administered.

3. Successful Bidder - the lowest, responsible, and responsive Bidder to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.

**1.3 Copies of Bidding Documents.**

A. Complete sets of the Bidding Documents in the number and for the fees stated in the Advertisement for Bid may be obtained from the Issuing Office.

B. Complete sets of Bidding Documents must be used in preparing bids; neither OWNER nor ENGINEER assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

C. OWNER and ENGINEER in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

**1.4 Examination of Contract Documents and Site.**

A. It is the responsibility of each Bidder before submitting a Bid:

1. To examine thoroughly the Contract Documents and other related data identified in the Bidding Documents (including "technical data" referred to below);

2. To visit the site to become familiar with and satisfy Bidder as to the general, local and site conditions that may affect cost, progress, performance, or furnishing of the Work;

3. To consider federal, state, and local Laws and Regulations that may affect cost, progress, performance, or furnishing of the Work;

4. To study and carefully correlate Bidder's knowledge and observations with the Contract Documents and other related data; and

5. To promptly notify ENGINEER of all conflicts, errors, ambiguities, or discrepancies which Bidder has discovered in or between the Contract Documents and such other related documents.

B. Reference is made to the Supplementary Conditions for the identification of:

1. Those reports of explorations and tests of subsurface conditions at or contiguous to the site which have been utilized by ENGINEER in preparation of the Contract Documents. Bidder may rely upon the general accuracy of the "technical data" contained in such reports, but not upon other data,

interpretations, opinions, or information contained in such reports or otherwise relating to the subsurface conditions at the site, nor upon the completeness thereof for the purpose of bidding or construction.

2. Those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site that have been utilized by ENGINEER in preparation of the Contract Documents. Bidder may rely upon the general accuracy of the "technical data" contained in such drawings but not upon other data, interpretations, opinions, or information shown or indicated in such drawings or otherwise relating to such structures, nor upon the completeness thereof for the purposes of bidding or construction.

   Copies of such reports and drawings will be made available by OWNER to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in Paragraph 4.02 of the General Conditions has been identified and established in Paragraph SC-4.02 of the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion drawn from any "technical data" or any such data, interpretations, opinions or information.

C. Information and data shown or indicated in the Contract 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 or others, and OWNER and ENGINEER do not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions or unless the OWNER of the Project also owns the Underground Facility.

D. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Contract Documents due to differing or unanticipated conditions appear in Paragraphs 4.02 and 4.03 of the General Conditions.

E. Before submitting a Bid, each Bidder will be responsible to obtain such additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise, which may affect cost, progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto or which Bidder deems necessary to determine its Bid for performing and furnishing the work in accordance with the time, price, and other terms and conditions of the Contract Documents.

F. On request, OWNER will provide each Bidder access to the site to conduct such examinations, investigations, explorations, tests, and studies, as each Bidder deems necessary for submission of a Bid. Bidder must fill all holes, clean up, and restore the site to its former conditions upon completion of such explorations, investigations,

tests, and studies.

G. Reference is made to the Supplementary Conditions for the identification of the general nature of work that is to be performed at the site by OWNER or others (such as utilities and other prime contractors) that relate to the work for which a Bid is to be submitted. On request, OWNER will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such work.

H. The submission of 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 Contract Documents and applying the specific means, methods, techniques, sequences, or procedures of construction (if any) that may be shown or indicated or expressly required by the Contract Documents, that Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Contract Documents and the written resolutions thereof by ENGINEER is acceptable to Bidder, and that the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.

I. The provisions of 1.5 A. through 1.5 H., inclusive, do not apply to Asbestos, Polychlorinated Biphenyls (PCBs), Petroleum, Hazardous Waste or Radioactive Material covered by Paragraph 4.06 of the General Conditions.

**1.5 Availability of Lands for Work, etc.**

The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by CONTRACTOR in performing the Work are identified in the Contract 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. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Contract Documents.

**1.6 Interpretations and Addenda.**

A. All questions about the meaning or intent of the Bidding Documents are to be directed to ENGINEER. 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 three days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

B. Addenda may also be issued to modify the Bidding Documents as deemed advisable by OWNER or ENGINEER.

## 1.7 Contract Times.

The number of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the term "Contract Times" is defined in Paragraph 1.01.A.14 of the General Conditions) are set forth in the Agreement and in Division 01.

## 1.8 Liquidated Damages.

Provisions for liquidated damages, if any, are set forth in the Agreement and in Division 01.

## 1.9 Substitute and "Or-Equal" Items.

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, applications for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement. The procedure for submission of any such application by CONTRACTOR and consideration by ENGINEER is set forth in Paragraph 6.05 of the General Conditions.

## 1.10 Subcontractors, Suppliers, and Others

Each Bidder shall submit to OWNER a list of all Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) 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, person, or organization if requested by OWNER. An OWNER or ENGINEER who after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, may before the Notice of Award is given request apparent Successful Bidder to submit an acceptable substitute, without an increase in Bid price.

If apparent Successful Bidder declines to make any such substitution, OWNER may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom OWNER or ENGINEER does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.

## 1.11 Bid Form

A. The Bid Form is included with the Bidding Documents; additional copies may be obtained from the Issuing Office.

B. All blanks on the Bid Form must be completed.

C. Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

D. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

E. All names must be typed or printed in ink below the signature.

F. The Bid shall contain an acknowledgement of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

G. The address and telephone number for communications regarding the Bid must be shown.

H. Evidence of authority to conduct business as an out-of-state corporation in the state where the Work is to be performed shall be provided in accordance with Paragraph 3 above. Federal I.D. number must also be shown.

## 1.12 Submission of Bids.

Bids shall be submitted (delivered, mailed or uploaded through QuestCDN.com) at the time and place indicated in the Advertisement for Bid or Invitation to Bid. If they are mailed or delivered, they shall be enclosed in an opaque sealed envelope and addressed as noted in the Advertisement for Bid. If they are submitted through QuestCDN.com, all required forms must be complete and uploaded to the site. All bids shall also be accompanied by Bid security (if required) and any other required documents as indicated.

## 1.13 Modification and Withdrawal of Bids.

A. Bids 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 at any time prior to the opening of Bids.

B. If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with the 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, that Bidder will be disqualified from further bidding on the

Work to be provided under the Contract Documents.

**1.14 Opening of Bids.**

Bids will be opened and (unless obviously non-responsive) read aloud publicly at the place where Bids are to be submitted. 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. In the event this is a private bid, bids will be opened privately and disclosed at a later date at the discretion of the Client.

**1.15 Bids to Remain Subject to Acceptance.**

All Bids will remain subject to acceptance for the period of time stated in the Bid Form and in Division 1, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to that date.

**1.16 Award of Contract.**

A. OWNER reserves the right to reject any or all Bids, including without limitation the rights to reject any or all nonconforming, nonresponsive, unbalanced or conditional Bids and to 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, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by OWNER. OWNER also reserves the right to waive all informalities not involving price, time, or changes in the Work. 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 use thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

B. In evaluating Bids, OWNER will consider the qualifications of Bidders, 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.

C. OWNER may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations has been requested. OWNER also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed when such data is required to be submitted as provided in the Supplementary Conditions.

D. OWNER may conduct such investigations as OWNER deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, and other persons and

organizations to perform and furnish the Work in accordance with the Contract Documents to OWNER's satisfaction within the prescribed time.

E. If the contract is to be awarded it will be awarded to the lowest Bidder whose evaluation by OWNER indicates to OWNER that the award will be in the best interests of the Project.

**1.17 Contract Security**

Article 5 of the General Conditions and the Supplementary Conditions set forth OWNER's requirements as to performance and payment Bonds. When the Successful Bidder delivers the executed Agreement to OWNER, it must be accompanied by the required performance and payment Bonds.

**1.18 Signing of Agreement.**

When OWNER gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement. Within ten days thereafter, CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER with the required Bonds. Within ten days thereafter OWNER will deliver one fully signed counterpart to CONTRACTOR.

END OF SECTION

SECTION 00 41 43

BID FORM

Proposal of _____ hereinafter called "BIDDER".

PROJECT IDENTIFICATION: Abel Court

PROJECT NUMBER: 190039

THIS BID IS SUBMITTED TO: Habitat for Humanity of Dane County
3101 Latham Drive,
Madison, WI 53713

hereinafter called "OWNER".

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the Bid Times indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.

2. BIDDER accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 45 days after the day of Bid opening. BIDDER will sign and deliver the required number of counterparts of the Agreement with the Bonds and other documents required by the Bidding Requirements within ten days after the date of OWNER's Notice of Award.

3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

   (a) BIDDER has examined and carefully studied the Bidding Documents and the following Addenda, receipt of all which is hereby acknowledged:

   Addendum No. _____ Dated _____
   Addendum No. _____ Dated _____
   Addendum No. _____ Dated _____

   (b) BIDDER has visited the site and become familiar with and is satisfied as to the general, local, and site conditions that may affect cost, progress, performance, and furnishing of the Work;

   (c) BIDDER is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, performance, and furnishing of the Work.

   d) BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions. BIDDER

accepts the determination set forth in paragraph SC-4.02 of the Supplementary Conditions of the extent of the "technical data" contained in such reports and drawings upon which BIDDER is entitled to rely as provided in paragraph 4.02 of the General Conditions. BIDDER acknowledges that such reports and drawings are not Contract Documents and may not be complete for BIDDER's purposes. BIDDER acknowledges that OWNER and ENGINEER do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has obtained and carefully studied (or assumes responsibility for having done so) all such additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.

(e) BIDDER is aware of the general nature of Work to be performed by OWNER and others at the site that relates to Work for which this BID is submitted as indicated in the Contract Documents.

(f) BIDDER has correlated the information known to BIDDER, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

(g) BIDDER has given ENGINEER written notice of all conflicts, errors, ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which the Bid is submitted.

(h) This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement of rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

4. BIDDER will complete the Work in accordance with the Contract Documents for the following prices:

## Section 00 41 43
## Able Court

| Bid Item No. | Spec Section Reference | Description | Unit of Measure | Estimated Quantity | Unit Price | Item Total |
|---|---|---|---|---|---|---|
| **GENERAL** | | | | | | |
| 1 | 01 30 00 | Performance & Payment Bonds | LS | 1 | | $ - |
| 2 | 01 30 00 | Mobilization | LS | 1 | | $ - |
| 3 | 01 55 26 | Traffic Control | LS | 1 | | $ - |
| | | | | | **Subtotal General:** | **$ -** |
| **DEMOLITION & REMOVALS** | | | | | | |
| 4 | 31 10 00 | Tree Removal | LS | 1 | | $ - |
| 5 | 31 10 00 | Sawcut | LF | 173 | | $ - |
| 6 | 31 10 00 | Remove Curb and Gutter | LF | 78 | | $ - |
| 7 | 31 10 00 | Remove Asphalt | SF | 990 | | $ - |
| 8 | 31 10 00 | Remove Concrete Sidewalk | SF | 606 | | $ - |
| | | | | | **Subtotal Demolition:** | **$ -** |
| **EARTHWORK** | | | | | | |
| 9 | 01 35 00 | Common Excavation | LS | 1 | | $ - |
| 10 | 01 35 00 | Strip Topsoil & Stockpile | CY | 1991 | | $ - |
| 11 | 01 35 00 | Topsoil Respread | CY | 1336 | | $ - |
| | | | | | **Subtotal Earthwork:** | **$ -** |
| **EROSION AND SEDIMENT CONTROL** | | | | | | |
| 12 | 31 25 13 | Tracking Pad - Clear Stone | EA | 1 | | $ - |
| 13 | 32 92 19 | Restoration - Seed, Fertilizer, & Mulch (Lot) | SY | 3375 | | $ - |
| 14 | 01 35 00 | Restoration - Seed, Fertilizer, & Erosion Mat (Terrace) | SY | 625 | | $ - |
| 15 | 31 25 13 | Silt Fence | LF | 982 | | $ - |
| 16 | 31 25 13 | Inlet Protection | EA | 8 | | $ - |
| | | | | | **Subtotal Erosion and Sediment Control:** | **$ -** |
| **SANITARY SEWER** | | | | | | |
| 17 | 33 31 13 | Sanitary Sewer - 8" PVC, SDR 35 | LF | 322 | | $ - |
| 18 | 33 31 13 | Sanitary Sewer Service Lateral - 4" PVC, SCH 40 | LF | 587 | | $ - |
| 19 | 33 31 13 | Sanitary Sewer Manhole - 48" Dia. | EA | 1 | | $ - |
| 20 | 31 05 13 | Select Granular Backfill - Trucked In - Sanitary Sewer | CY | 700 | | $ - |
| 21 | 33 31 13 | Sanitary Sewer Televising | LF | 322 | | $ - |
| | | | | | **Subtotal Sanitary Sewer:** | **$ -** |
| **WATER MAIN** | | | | | | |
| 22 | 33 11 13 | Water Main - 6" D.I. CL 52 | LF | 25 | | $ - |
| 23 | 33 11 13 | Water Main - 8" D.I. CL 52 | LF | 443 | | $ - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 24 | 33 12 16 | Gate Valve & Box - 6" | EA | 2 | | $ | - |
| 25 | 33 12 16 | Gate Valve & Box - 8" | EA | 2 | | $ | - |
| 26 | 33 12 16 | Water Service Lateral - 1" Copper w/ Curb Stop | LF | 570 | | $ | - |
| 27 | 33 12 16 | Styrofoam Insulation - 2" x 4' x 8' Sheet | EA | 1 | | $ | - |
| 28 | 33 12 19 | Hydrant - New | EA | 2 | | $ | - |
| 29 | 33 12 16 | Connect to Existing Water Main | EA | 2 | | $ | - |
| 30 | 31 05 13 | Select Granular Backfill - Trucked In - Water Main | CY | 425 | | $ | - |
| 31 | 33 41 13 | Storm Sewer - 12" RCP, Class III | LF | 252 | | $ | - |
| 32 | 33 41 13 | Storm Sewer - 15" RCP, Class III | LF | 30 | | $ | - |
| 33 | 33 41 13 | Inlet - 2' x 3' Precast Box with Frame & Grate | EA | 2 | | $ | - |
| 34 | 33 41 13 | 24" Dia. Inlet with In-Bell Grate | EA | 2 | | $ | - |
| | | | | **Subtotal Water Main:** | | **$** | **-** |
| **STREETS AND PAVEMENT** | | | | | | | |
| 35 | 33 41 13 | Tie Into Existing Manhole | EA | 1 | | $ | - |
| 36 | 32 12 16 | HMA Pavement Upper Layer (1.75") 4 LT 58-28 S | TON | 155 | | $ | - |
| 37 | 32 12 16 | HMA Pavement Lower Layer (2.0") 3 LT 58-28 S | TON | 177 | | $ | - |
| 38 | 32 11 23 | Base Aggregate Dense - 3/4" | TON | 423 | | $ | - |
| 39 | 32 11 23 | Base Aggregate Dense - 3" | TON | 1269 | | $ | - |
| 40 | 32 11 23 | Breaker Run | CY | 160 | | $ | - |
| 41 | 32 23 16 | Excavation Below Subgrade (EBS) Undercut | CY | 160 | | $ | - |
| 42 | - | Concrete Curb & Gutter - 30" | LF | 697 | | $ | - |
| 43 | - | Concrete Sidewalk - 5" Thickness w/ 4" Base Aggregate Dense | SF | 3812 | | $ | - |
| 44 | - | Curb Ramp Detectable Warning Field - Yellow | EA | 2 | | $ | - |
| 45 | 01 35 00 | Stop Sign | EA | 1 | | $ | - |
| 46 | 01 35 00 | Street Name Sign | EA | 1 | | $ | - |
| | | | | **Subtotal Streets and Pavement:** | | **$** | **-** |

The TOTAL BID PRICE is: _____

Dollars ($_____)

BIDDER acknowledges that quantities are not guaranteed and final payment will be based on actual quantities determined as provided in the Contract Documents.

5. BIDDER agrees that Work will be substantially completed and completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement and in Division 1.

   BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified in the Agreement.

6. The following sections are attached to and made a condition of this Bid:

   (a) Required Bid security.

   (b) A tabulation of Subcontractors, suppliers and other persons and organizations required to be identified in this Bid.

   (c) Required BIDDER'S List of References.

Respectfully submitted:

**BIDDER:**

_____

_____
Signature

_____
Please Type Name and Title

_____
Address

_____

_____
Phone

**(SEAL)**

ATTEST:

_____
Signature

_____
Please Type Name and Title

_____
Date

_____
Federal I.D. Number

LIST OF REFERENCES

The following is a list of projects similar in nature and cost that have been completed by the Bidder within the past five (5) years.

**********

Project Name:_____ _____
(Owner Name)

Project Cost:_____

Description:_____ _____
(Address)

_____ _____

_____ _____
(Contact Person) (Phone No.)

**********

Project Name:_____ _____
(Owner Name)

Project Cost:_____

Description:_____ _____
(Address)

_____ _____

_____ _____
(Contact Person) (Phone No.)

**********

Project Name:_____ _____
(Owner Name)

Project Cost:_____

Description:_____ _____
(Address)

_____ _____

_____ _____
(Contact Person) (Phone No.)

**********

Project Name:_____ _____
(Owner Name)

Project Cost:_____

Description:_____ _____
(Address)

_____ _____

_____ _____
(Contact Person) (Phone No.)

**********

LIST OF SUBCONTRACTORS

If awarded this Contract, the Bidder declares the intent to employ the following Subcontractors for the Class of Work as noted below:

| NAME OF SUBCONTRACTOR | FEDERAL EMPLOYEE INDENTIFICATION NUMBER (FEIN) | CLASS OF WORK |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

The above is a full and complete list of all the proposed Subcontractors and the Class of Work to be performed by each. This list shall not be altered without the written consent of the OWNER.

LIST OF SUPPLIERS

If awarded this Contract, the Bidder declares the intent to have materials provided by the following Suppliers as noted below

| NAME OF SUPPLIER OR MANUFACTURER | MATERIAL |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |

This list shall not be altered without the written consent of the OWNER.

## DISCLOSURE OF OWNERSHIP

Personally identifiable information may be used for secondary purposes.
See s. 15.04(1)(m) Stats. for details.

**(1) INSTRUCTIONS:** On the date a CONTRACTOR submits a bid to or completes negotiations with a state agency or local governmental unit on a project subject to ss. 66.0903 or 103.49, Stats., the CONTRACTOR shall disclose to such state agency or local governmental unit the name of any "other construction business" which the CONTRACTOR, or a shareholder, officer or partner of the CONTRACTOR, owns or has owned within the preceding three (3) years.

**(2) DEFINITION:** The term "other construction business" means any business engaged in erection, construction, remodeling, repairing, demolition, altering, or painting and decorating buildings, structures or facilities and any business engaged in supplying mineral aggregate or hauling excavated material or spoil, as provided by ss. 66.0903(3), 103.49(2) and 103.50(2), Stats.

**(3) WHEN TO COMPLETE FORM:** This form ONLY needs to be completed if (a) the CONTRACTOR, or a shareholder, officer or partner of the CONTRACTOR, owns at least a 25% interest in the "other construction business" indicated below on the date the CONTRACTOR submits a bid or completes negotiations, or has owned at least a 25% interest in the "other construction business" at any time within the preceding three (3) years; and (b) the Wisconsin Department of Workforce Development (DWD) has determined that the "other construction business" failed to pay the prevailing wage rate or time and one-half the required hourly basic rate of pay for hours worked in excess of the prevailing hours of labor to any employee at any time within the preceding three (3) years. This form DOES NOT have to be completed if the requirements of both (a) and (b) above are not met. If the requirements of both (a) and (b) above are met, this form must ONLY be filed with the state agency or local government unit that will be awarding the contract.

**(4) NAME AND ADDRESS OF OTHER CONSTRUCTION BUSINESS:** Indicate below the name(s) and address(es) of any "other construction business" which meets all of the criteria specified in (2) and (3) above.

| | |
|---|---|
| Name of Other Construction Business | Street or P.O. Box, City, State and Zip |
| Name of Other Construction Business | Street or P.O. Box, City, State and Zip |
| Name of Other Construction Business | Street or P.O. Box, City, State and Zip |

**I HEREBY STATE UNDER PENALTY OF PERJURY THAT THE INFORMATION CONTAINED IN THIS DOCUMENT IS TRUE AND ACCURATE ACCORDING TO MY KNOWLEDGE AND BELIEF.**

| | |
|---|---|
| Print Name of Authorized Officer | Signature of Authorized Officer |
| Title of Authorized Officer | This _____ day of _____, 20___ |
| Name of Corporation, Partnership, or Sole Proprietorship | Address (Incl. Street or P.O. Box, City, State & Zip) |

The statutory authority for the use of the form is prescribed in ss. 66.0903(12)(d) and 103.49(7)(d). Stats. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in s. 103.005(12). Stats.

AFFIDAVIT OF ORGANIZATION AND AUTHORITY

I, _____, being first duly sworn on oath certify that _____ (Name of corporation, partnership, or person submitting bid) Bidder on the attached Proposal is organized as indicated below; that I have examined and carefully prepared this Proposal from the Plans and Specifications and have checked the same in detail before submitting this Proposal; that all statements made herein are made on behalf of such Bidder and that I have full authority to make such statements and submit this Proposal in (its) (their) behalf; and that the said statements are true and correct.

Bidder is (fill out applicable paragraph)

A corporation organized and existing under the laws of the State of _____ _____, its President is _____, its Secretary is _____ _____, and it does have a corporate seal. The _____ _____(Officer or authorized agent) authorized to sign construction Contracts and Bids for the company by action of its Board of Directors taken _____, a certified copy of which is attached hereto.
(Strike out this last sentence if not applicable.)

A partnership consisting of _____and _____, partners doing business under the name of _____.

An individual operating under the trade name of _____ _____.

_____
Signature

_____
Title, if any

_____

_____
Bidders Address

_____
Telephone

Subscribed and sworn to before me this ____ day of _____, 20__.

_____
Notary Public, _____ County,_____
My Commission expires _____

(This Affidavit must be attached to and filed with the Bid Proposal.)

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SECTION 00 51 00

NOTICE OF AWARD

Date: _____

Project: Abel Court

Owner: Habitat for Humanity of Dane County

Engineer's Project No.: 190039

Bidder:

Bidder's Address:

You are notified that your Bid dated _____ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for _____

*Work on the Project includes the construction of Abel Court in the City of Stoughton, Wisconsin. The project includes approximately 1,000 CY of Common Excavation, 300 LF of 8" diameter sanitary sewer, 435 LF of 8" diameter D.I. Water Main, 900 Tons of Aggregate Base Course, 700 LF of Concrete Curb & Gutter, 3,525 SF of Concrete Sidewalk, 350 Tons of Hot-Mix Asphalt Pavement, restoration of the work area, and other miscellaneous items in conformance with the Contract Documents.*

The Contract Price of your Contract is _____ Dollars ($_____).

3 copies of the proposed Contract Documents (except Drawings) accompany this Notice of Award.

3 sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within 10 days of the date you receive this Notice of Award.

1. Deliver to the Owner 3 fully executed counterparts of the Contract Documents.
2. Deliver with the executed Contract Documents the Contract security [Bonds] as specified in the Instructions to Bidders (Article 20), General Conditions (Paragraph 5.01), and Supplementary Conditions (Paragraph SC-5.01).
3. Other conditions precedent:
   Insurance Certificates as indicated by the General Conditions (Paragraph 5.03)

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

Habitat for Humanity of Dane County
Owner

By:_____
Authorized Signature

_____
Title

_____
Date

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SECTION 00 52 13

STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT

THIS AGREEMENT is by and between Habitat for Humanity of Dane County ("Owner") and _____ ("Contractor").

Owner and Contractor hereby agree as follows:

**ARTICLE 1 – WORK**

1.01 *Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:*

*Work on the Project includes the construction of Abel Court in the City of Stoughton, Wisconsin. The project includes approximately 1,000 CY of Common Excavation, 300 LF of 8" diameter sanitary sewer, 435 LF of 8" diameter D.I. Water Main, 900 Tons of Aggregate Base Course, 700 LF of Concrete Curb & Gutter, 3,525 SF of Concrete Sidewalk, 350 Tons of Hot-Mix Asphalt Pavement, restoration of the work area, and other miscellaneous items in conformance with the Contract Documents.*

**ARTICLE 2 – THE PROJECT**

2.01 *The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:*

*Abel Court*

**ARTICLE 3 – ENGINEER**

3.01 *The Project has been designed by* Vierbicher Associates, Inc. *(Engineer), which is to act as Owner's representative, assume all duties and responsibilities, and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.*

**ARTICLE 4 – CONTRACT TIMES**

4.01 *Time of the Essence*

All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Days to Achieve Substantial Completion and Final Payment*

A. The Work will be substantially completed within 60 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with

Paragraph 14.07 of the General Conditions within 75 days after the date when the Contract Times commence to run. All work must be completed by _____.

4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner $955 for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner $955 for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

**ARTICLE 5 – CONTRACT PRICE**

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraphs 5.01.A, 5.01.B, and 5.01.C below:

A. For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the actual quantity of that item:

The Bid prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the General Conditions.

B. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

**ARTICLE 6 – PAYMENT PROCEDURES**

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 15th day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments

will be measured by the schedule of values established as provided in Paragraph 2.07.A of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the General Conditions.

    a. 95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

    b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 98 percent of the Work completed, less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and less 110 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of Substantial Completion.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

**ARTICLE 7 – INTEREST**

7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the rate of 12 percent per annum.

**ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

E. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

F. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

**ARTICLE 9 – CONTRACT DOCUMENTS**

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement (pages 1 to 7, inclusive).

2. Performance bond (pages 1 to 3, inclusive).

3. Payment bond (pages 1 to 3, inclusive).

4. General Conditions (pages 1 to 61, inclusive).

5. Supplementary Conditions (pages 1 to 6, inclusive).

6. Specifications as listed in the table of contents of the Project Manual.

7. Drawings consisting of 13 sheets with each sheet bearing the following general title: Able Court.

8. Addenda (numbers _____ to _____, inclusive).

9. Exhibits to this Agreement (enumerated as follows):

a. Contractor's Bid (pages _____ to _____, inclusive).

b. Documentation submitted by Contractor prior to Notice of Award (pages _____ to _____, inclusive).

c. *[List other required attachments (if any), such as documents required by funding or lending agencies]*.

10. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

a. Notice to Proceed (pages 1 to 1, inclusive).

b. Work Change Directives.

c. Change Orders.

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

**ARTICLE 10 – MISCELLANEOUS**

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the General Conditions and the Supplementary Conditions.

10.02 *Assignment of Contract*

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part

thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

10.05 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 10.05:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____ (which is the Effective Date of the Agreement).

OWNER:

Habitat for Humanity of Dane County

By: _____

Title: _____

Attest: _____

Title: _____

Address for giving notices:

Habitat for Humanity of Dane County

3101 Latham Drive

Madison, WI 53713

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

CONTRACTOR

_____

By: _____

Title: _____

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____

Title: _____

Address for giving notices:

_____

_____

_____

License No.: _____

(Where applicable)

Agent for service of process:

_____

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SECTION 00 55 00

NOTICE TO PROCEED

Date: _____

Project: Abel Court

Owner: Habitat for Humanity of Dane County

Engineer's Project No.: 190039

Contractor:

Contractor's Address:

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents. In accordance with Article 4 of the Agreement, the date of Substantial Completion is _____, and the date of readiness for final payment is _____ [(or) the number of days to achieve Substantial Completion is _____, and the number of days to achieve readiness for final payment is _____].

Also, before you may start any Work at the Site, you must:

| | |
|---|---|
| Habitat for Humanity of Dane County | |
| Owner | Contractor |
| Given by: | Given by: |
| Authorized Signature | Authorized Signature |
| Title | Title |
| Date | Date |

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# PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT
Effective Date of Agreement:
Amount:
Description (*Name and Location*):

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

_____ (Seal)
Contractor's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

**SURETY**

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature (Attach Power of Attorney)

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.

2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
   - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
   - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
   - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
     1. Surety in accordance with the terms of the Contract; or
     2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.

3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:

   - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
   - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
   - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
   - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
     1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
     2. Deny liability in whole or in part and notify Owner citing reasons therefor.

4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.

5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

| |
|---|
| FOR INFORMATION ONLY – (*Name, Address and Telephone*)<br>Surety Agency or Broker:<br>Owner's Representative (*Engineer or other party*): |

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# PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

CONTRACT
Effective Date of Agreement:
Amount:
Description *(Name and Location)*:

BOND
Bond Number:
Date (*Not earlier than Effective Date of Agreement*):
Amount:
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

**CONTRACTOR AS PRINCIPAL**

_____ (Seal)
Contractor's Name and Corporate Seal

By: _____
Signature

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

**SURETY**

_____ (Seal)
Surety's Name and Corporate Seal

By: _____
Signature (Attach Power of Attorney)

_____
Print Name

_____
Title

Attest: _____
Signature

_____
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to Owner, this obligation shall be null and void if Contractor:

2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.

4. Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with Contractor:

1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.

5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.

6. Reserved.

7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.

8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.

9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – (*Name, Address, and Telephone*)
Surety Agency or Broker:
Owner's Representative (*Engineer or other*):

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**REQUEST AND CERTIFICATE FOR PAYMENT**

PROJECT: Abel Court

ENGINEER'S PROJECT # : 190039

OWNER: Habitat for Humanity of Dane County
3101 Latham Drive
Madison, WI 53713

CONTRACTOR: CONTRACTOR NAME
CONTRACTOR ADDRESS
CONTRACTOR CITY, STATE, ZIP

ENGINEER: Vierbicher Associates, Inc.
999 Fourier Drive, Suite 201
Madison, WI 53717

REQUEST NO. **1** REQUEST DATE:

| CHANGE ORDER SUMMARY | | | |
|---|---|---|---|
| Previously Approved Change Orders: | | Additions | Deductions |
| | | | |
| | | | |
| | | | |
| | | | |
| Current Change Orders: | | Additions | Deductions |
| | | | |
| | | | |
| | Net Change by Change Orders: | | **$0.00** |

Request is made for payment, as shown below, in connection with the contract. Continuation Sheet is attached.

The present status of the contract is as follows:

ORIGINAL CONTRACT SUM:..... $0.00

NET CHANGE BY CHANGE ORDERS:..... $0.00

CONTRACT SUM TO DATE:..... $0.00

TOTAL COMPLETED TO DATE:..... $0.00

RETAINAGE: (5% of work completed until 50% complete)..... $0.00

TOTAL EARNED LESS RETAINAGE:..... $0.00

LESS PREVIOUS CERTIFICATES FOR PAYMENT:..... $0.00

CURRENT PAYMENT DUE:..... $0.00

The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of work completed under the contract referred to above have been applied to discharge in full, all obligations of CONTRACTOR incurred in connection with the work covered by prior applications for payment numbered _0_ through _1_ inclusive (none); and (2) title to all 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, claims, security interests, and encumbrances (except such as covered by Bond acceptable to OWNER).

Submitted by Contractor: _____ Date: _____

I herby certify that I have reviewed the work and that to the best of my knowledge and belief, the quantities shown in this estimate are correct. This application is in conformance with the Contract Documents, therefore, I recommend payment of XXXXXXX and XX/100 ($XXXXX).

Recommended by Engineer: _____ Date: _____

Approved by Owner: _____ Date: _____

**CONTINUATION SHEET**

REQUEST AND CERTIFICATE FOR PAYMENT -CONTRACTOR'S SIGNED CERTIFICATE IS ATTACHED

PROJECT: Abel Court

ENGINEER'S PROJECT # : 190039

OWNER: Habitat for Humanity of Dane County
3101 Latham Drive
Madison, WI 53713

CONTRACTOR: CONTRACTOR NAME
CONTRACTOR ADDRESS
CONTRACTOR CITY, STATE, ZIP

ENGINEER: Vierbicher Associates, Inc.
999 Fourier Drive, Suite 201
Madison, WI 53717

REQUEST NO. 1 REQUEST DATE:

| Item No. (A) | Description of Work (B) | Unit of Measure | Scheduled Quantity (C) | Unit Price (D) | Item Total (C*D) | Work Completed | | | | Total Completed To Date (E+F) | | % Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Previous Requests (E) | | This Request (F) | | | | |
| | | | | | | Quantity | Amount | Quantity | Amount | Quantity | Amount | |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
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| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
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| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
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| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |

| Item No. (A) | Description of Work (B) | Unit of Measure | Scheduled Quantity (C) | Unit Price (D) | Item Total (C*D) | Work Completed | | | | Total Completed To Date (E+F) | | % Complete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Previous Requests (E) | | This Request (F) | | | | |
| | | | | | | Quantity | Amount | Quantity | Amount | Quantity | Amount | |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | $0.00 | $0.00 | | $0.00 | | $0.00 | 0 | $0.00 | #DIV/0! |
| | | | | | | | | | | | | |
| | **Original Contract TOTAL:** | | | | **$0.00** | | **$0.00** | | **$0.00** | | **$0.00** | |
| | | | | | | | | | | | | |
| **Change Orders/Additions** | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | **Subtotal - Change Orders/Additions:** | | | | **$0.00** | | **$0.00** | | **$0.00** | | **$0.00** | |
| | **TOTAL:** | | | | **$0.00** | | **$0.00** | | **$0.00** | | **$0.00** | |

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SECTION 00 65 16

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Abel Court

Project #: 190039

Owner: Habitat for Humanity of Dane County
3101 Latham Drive,
Madison, WI 53713

Contractor:

Contract Date:

The Work performed under this Contract has been reviewed and found to be substantially complete. The Date of Substantial Completion is hereby established as: _____.

**DEFINITION OF DATE OF SUBSTANTIAL COMPLETION**

The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Engineer when construction is sufficiently complete, in accordance with the Contract Documents, so the OWNER may occupy the Work or designated portion thereof for the use for which it is intended.

A list of items to be completed, prepared by the ENGINEER, is appended hereto. 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.

Vierbicher Associates, Inc. _____ _____
ENGINEER BY DATE

The CONTRACTOR will complete or correct the Work on the list of items appended hereto prior to Final Contract Payment.

_____ _____ _____
CONTRACTOR BY DATE

The OWNER accepts the Work or designated portion thereof as substantially complete as indicated above.

Habitat for Humanity of Dane County_____ _____
OWNER BY DATE

END OF SECTION

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

Issued and Published Jointly by

AMERICAN COUNCIL OF ENGINEERING COMPANIES

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

AMERICAN SOCIETY OF CIVIL ENGINEERS

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Endorsed by

CONSTRUCTION SPECIFICATIONS INSTITUTE


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## ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*—The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.


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12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*—See Paragraph 11.01 for definition.

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*—The individual or entity named as such in the Agreement.

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 1 of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.


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27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*—Polychlorinated biphenyls.

31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.


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40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

41. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

43. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

44. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

47. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

48. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

49. *Unit Price Work*—Work to be paid for on the basis of unit prices.

50. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an


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addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives:*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day:*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective:*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

   a. does not conform to the Contract Documents; or

   b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

   c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide:*


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1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

## ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.


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2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of


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the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

## ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies:*


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1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation , (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies:*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

   a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

   b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or


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3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

## ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the


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Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

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).

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. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, 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.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or


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4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.


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4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data;

   b. locating all Underground Facilities shown or indicated in the Contract Documents;

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.


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4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

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. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, 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.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to


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permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.


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## ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.


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C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners,


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employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

   a. Such insurance shall remain in effect for two years after final payment.

   b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of


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them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a Builder's Risk "all-risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.


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E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.


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5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.


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## ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.


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6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.


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2. *Substitute Items:*

   a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

   b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

   c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

   d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

      1) shall certify that the proposed substitute item will:

         a) perform adequately the functions and achieve the results called for by the general design,

         b) be similar in substance to that specified, and

         c) be suited to the same use as that specified;

      2) will state:

         a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

         b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

         c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

      3) will identify:

         a) all variations of the proposed substitute item from that specified, and

         b) available engineering, sales, maintenance, repair, and replacement services; and

      4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.


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B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or


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entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its


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use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner


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and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas:*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.


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6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts


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any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:*

a. Submit number of Samples specified in the Specifications.


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b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

   a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

   b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

   c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

   d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review:*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the


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Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures:*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;


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3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.


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6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe


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access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.


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## ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws


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and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

## ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.


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9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations


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on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of,


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and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

## ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of


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executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.


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E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

## ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.


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4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

   c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

   f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

   g. The cost of utilities, fuel, and sanitary facilities at the Site.

   h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

   i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:


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1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances:*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in


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the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance:*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect to any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

## ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.


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B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

   a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

   b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

   c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

   d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

   e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

   f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.


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12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.


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## ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.


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E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers,


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architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.


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13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.


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D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments:*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's


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review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:


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a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.


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14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:


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1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment:*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and


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d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance:*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.


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14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

## ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);


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2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other


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dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

## ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or


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2. agrees with the other party to submit the Claim to another dispute resolution process; or

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.


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SECTION 00 73 00

SUPPLEMENTARY CONDITIONS - EJCDC

1.1 SUMMARY

A. Section Includes:

1. Supplementary Conditions.

1.2 These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (C-700)(2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

SC-1

Definitions

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract C-700, (2007 Edition) have the meanings assigned to them in the General Conditions.

SC-2.01

Delivery of Bonds and Evidence of Insurance

Delete paragraph 2.01 of the General Conditions in its entirety and insert the following in its place:

2.01.A When Contractor delivers the executed Agreement to Owner, Contractor shall also deliver to Owner such Bonds, insurance certificates and other documents as Contractor may be required to furnish in accordance with Article 5 of the General Conditions or other provisions of the Contract Documents.

2.01.B Before any work at the site is started, Contractor shall deliver to Owner the required number of counterparts of the fully executed Agreement, Bonds and other documents as may be required by the Contract Documents, as well as Owner approved copies of certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) with copies to each additional insured identified in the Supplementary Conditions, which Contractor is required to purchase and maintain in accordance with Article 5. Costs incurred to purchase, obtain, maintain and comply with Article 5 – Bonds and Insurance shall be borne by the Contractor, at no extra cost to the Owner, or additional insured.

SC-2.05

Before Starting Construction

Add the following to paragraph 2.05.A of the General Conditions:

2.05.A.4

A proposed listing of subcontractors and major material and equipment suppliers. The list shall include any proposed substitutions in accordance with paragraph 6.05 of the

General Conditions.

SC-2.05.A.3

Preliminary Schedules

The Bid will be considered as the Schedule of Values of the work required by the General Conditions except that a Schedule of Values shall be submitted for each lump sum bid item as requested by the Engineer.

SC-3.03.A.2

Reporting Discrepancies

Add the following language at the end of paragraph 3.03.A.2 of the General Conditions.

If Contractor proceeds with work that Contractor had actual knowledge or should have known that a conflict, error, ambiguity or discrepancy existed as indicated above, correction of work constructed without such notification to Engineer shall be at Contractor's expense, (except in an emergency as authorized by paragraph 6.16.A).

SC-5.01

Add the following to paragraph 5.01 of the General Conditions:

**Performance and Payment Bonds**

The forms of the Performance and Payment Bonds attached hereto may be used for the Contract. Note instructions thereon as to the form applicable. Each form contemplates one corporate surety only. In case co-sureties or individual sureties will be furnished, proper forms therefore shall be obtained. Besides the stipulations of paragraphs 5.01 through 5.03 of the General Conditions, the surety on the Bonds shall provide a certificate indicating surety is licensed to underwrite contracts in the jurisdiction of the project location which shall be attached to the Bonds.

Every Bond must run to the Owner.

If the principal is an individual, his/her full name and residence shall be inserted in the body thereof, and he/she shall sign the Bonds with his/her usual signature on the line opposite the scroll seal. If the principals are partners, their individual names shall appear in the body of the Bonds, with the recital that they are partners comprising a firm, naming it, and all the members of the firm shall execute the Bonds as individuals.

The signature of a witness shall appear in the appropriate places, attesting the signatures of each individual party to the Bonds.

If the principal is a corporation, the name of the state in which incorporated shall be inserted in the appropriate place in the body of the Bonds, and said instrument shall be executed and attested under the corporate seal as indicated on the form. If the corporation has no seal, the fact shall be stated, in which case a scroll or adhesive seal shall appear following the corporate name. This also applies to execution by surety.

The date of the Bonds must not be prior to the date of the Contract for which given.

A power of attorney, authorizing the execution of the Bonds by an attorney-in-fact, or agent, shall be attached to one executed counterpart of the Bonds.

SC-5.03

Certificates of Insurance: Delete paragraph 5.03 of the General Conditions in its entirety and insert the following in its place:

SC-5.03 Contractor shall deliver to Owner, with copies to each additional insured or loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain in accordance with paragraphs 5.04, 5.06, 5.07, 5.08, 5.09 and 5.10 of the General Conditions.

SC-5.04

The Limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

Workers' Compensation, etc. under paragraphs 5.04.A.3 and 5.04.A.5 of the General Conditions:

(1) State ..... Statutory
(2) Applicable Federal (e.g., Longshoreman's) ..... Statutory
(3) Employer's Liability ..... $500,000

Contractor's Liability Insurance under paragraphs 5.04.A.3 through 5.04.A.5 of the General Conditions which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of Contractor:

(1) General Aggregate (Except Products - Completed Operations) ..... $1,000,000
(2) Products - Completed Operations Aggregate ..... $1,000,000
(3) Personal and Advertising Injury (Per Person/Organization) ..... $1,000,000
(4) Each Occurrence (Bodily Injury and Property Damage) ..... $1,000,000
(5) Property Damage liability insurance will provide Explosion, Collapse, and Underground coverages where applicable.
(6) Excess Liability

General Aggregate ..... $1,000,000
Each Occurrence ..... $1,000,000

5.04.A.6

Automobile Liability:

(1) Bodily Injury:
Each Person ..... $1,000,000
Each Accident ..... $1,000,000

Property Damage:
Each Accident ..... $500,000

**OR**

(2) Combined Single Limit (Bodily Injury and Property Damage):

Each Accident ..... $1,000,000

5.04.B.1

Amend in paragraph 5.04.B.1 of the General Conditions the phrase "with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive" to read "with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.5, inclusive.

Add the following at the end of paragraphs 5.04.B.7 of the General Conditions:

Insurance certificates shall specifically indicate by name the additional insured which are to include Owner and Engineer as well as other persons or entities so identified as follows:

| | |
|---|---|
| OWNER: | Habitat for Humanity of Dane County |
| Additional Insured: | Vierbicher Associates, Inc.<br>City of Stoughton |

5.04.B.2

Umbrella:

1. Umbrella policy (pay on behalf form) with limits of $2,000,000 for bodily injury, personal injury and property damage on a combined basis shall be provided with the stated underlying limits of paragraphs 5.04.A.3 to 5.04.A.6 of the Supplementary Conditions.

2. Policy shall include Owner, Engineer and any others required by paragraph 5.04.B.7 of the General Conditions as additional insureds.

5.04.B.3

The Contractual Liability coverage required by paragraph 5.04.B.4 of the General Conditions shall provide coverage for not less than the following amounts:

(1) General Aggregate ..... $1,000,000
(2) Each Occurrence (Bodily Injury and Property Damage) ..... $1,000,000

SC-6.20.A

Modify paragraph to read as follows:

"To the fullest extent permitted by Laws and Regulations, Contractor shall *defend*, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including

the loss of use resulting therefore but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable ."

SC-8.11.B

Add paragraph 8.11.B to the General Conditions.

"The Owner may, by written consent of the Contractor, assign the Contract to an institutional lender providing construction financing of the project. In such event, the lender shall assume the Owner's rights and obligation under the Contract Documents. The Contractor shall execute all consents reasonable required to facilitate such assignment.

SC-9.02.C

Add paragraph 9.02 (C) to the General Conditions.

9.02 (C) The Contractor shall reimburse the owner for compensation paid to the Engineer or Engineer's Consultant for additional visits made necessary by the fault, neglect or request of the Contractor.

SC-10.05.B

Amend the first, second, and third sentences of paragraph 10.05.B of the General Conditions to read as follows:

*NOTICE:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and other party to the Contract promptly (but in no event later than 15 days) after the start of the event giving rise thereto. The responsibility to substantiate a claim shall rest with the party making claim. Notice of the amount or extent of the Claim with supporting data shall be delivered to the Engineer and the other party to the Contract within 30 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim.

and as so amended paragraph 10.05.B remains in effect.

SC-11.01.A.5.c.1

Add a new paragraph immediately after 11.01.A.5.c of the General Conditions which is to read as follows:

"Construction equipment or machinery used to determine the Cost of Work under Section 12.01.B.3 of the General Conditions shall be paid for at an hourly rate, including hourly operating costs, that will be agreed to by Owner. The construction equipment and machinery hourly rate determined for the cost of work shall be applied only while the construction equipment or machinery is actually being used or moved under its own power to the site. For construction equipment or machinery transported to the site, the hourly rate shall apply to the transporting vehicle only. The cost of equipment not being used on the site shall not be included in determining the cost of work.

SC-12.01.B.2

Amend paragraph 12.01.B.2 of the General Conditions to read as follows:

"Where the Work involved is not covered by unit prices contained in the Contract Documents (e.g. not included on Bid Form), by a mutually agreed lump sum or unit price (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2);"

and as so amended paragraph 12.01.B.2 remains in effect.

SC-12.01.B.3

Amend paragraph 12.01.B.3 of the General Conditions to read as follows:

"Where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum or unit price is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C);"

and as so amended paragraph 12.01.B.3 remains in effect.

SC-14.02.B.5.e

Add a new paragraph immediately after paragraph 14.02.B.5.d of the General Conditions which is to read as follows:

"liability for liquidated damages has been incurred by Contractor;"

SC-14.06.B

Add paragraph 14.06.B to the General Conditions.

14.06.B. Upon request by the Owner and prior to the expiration of one year from the date of substantial completion, the Engineer will conduct and the Contractor shall attend a meeting with the Owner to review the project, operations and performance.

The one-year period for correction of work shall be extended with respect to portions of work first performed after substantial completion by the period of the time between substantial completion and the actual performance of the work.

SC-17.07

Owner's Project Representative.

Gary Blazek, PE, Department Manager the Owner's Project Manager, shall act as the Owner's Project Representative and contact person for this particular project.

SECTION 00 73 43

WAGE REQUIREMENTS

1.1 WAGE REQUIREMENTS

A. Minimum Wage Scale

1. The wage rates for this project shall be the minimum wage scale as set by law that is in effect during the project.

2. This wage schedule does not prohibit the payment of a higher rate nor does it limit the amount of hours worked during a particular period of time.

The CONTRACTOR must file an affidavit with the OWNER, prior to receiving final payment, which states that all of the provisions and requirements of ss. 66.0903(3), Wis. Stats. have been complied with, that the CONTRACTOR has received similar evidence of compliance from all agents and subcontractors and that full and accurate records have been kept. The OWNER will not authorize final payment to the CONTRACTOR until an affidavit is filed in proper form and order.

END OF SECTION

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SECTION 00 91 13

ADDENDA

1.1 No Addenda at this time.

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SECTION 00 94 10

CHANGE ORDER

Project: Abel Court

Vierbicher Project No.: 190039

To: Habitat for Humanity of Dane County
3101 Latham Drive,
Madison, WI 53713

Contract Date:

Contract Completion Date:

The Contract for the above Project shall be changed as follows:

**These changes result in the following adjustment of Contract Price and Contract Time:**

| | |
|---|---|
| Original Contract Price | $ |
| Contract Price with Previously Approved Change Orders | $ |
| Net Change in Contract Price Due to This Change Order | $ |
| Current Contract Price Including This Change Order | $ |

Contract Time Prior to This Change Order
Contract Time with Previously Approved Change Orders
Net Change in Contract Time Due to This Change Order
Current Contract Time Including This Change Order

NOTE: The above changes do not reflect changes in the Contract Price due to measured quantities for items constructed in conformance with the Contract Documents.

CHANGE ORDER IS VALID ONLY IF SIGNED BY THE ENGINEER, CONTRACTOR, AND OWNER

| | | |
|---|---|---|
| Vierbicher Associates, Inc. | | Habitat for Humanity of Dane County |
| ENGINEER | CONTRACTOR | OWNER |
| 999 Fourier Drive | | 3101 Latham Drive, |
| Address | Address | Address |
| Madison, WI 53717 | | Madison, WI 53713 |
| Signature | Signature | Signature |
| Date | Date | Date |

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SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES

1. Contract description.
2. Contractor's use of Site.
3. Work sequence.
4. **Permits.**
5. Specification conventions.

1.2 CONTRACT DESCRIPTION

A. Work on the Project includes the construction of Abel Court in the City of Stoughton, Wisconsin. The project includes approximately 1,000 CY of Common Excavation, 300 LF of 8" diameter sanitary sewer, 435 LF of 8" diameter D.I. Water Main, 900 Tons of Aggregate Base Course, 700 LF of Concrete Curb & Gutter, 3,525 SF of Concrete Sidewalk, 350 Tons of Hot-Mix Asphalt Pavement, restoration of the work area, and other miscellaneous items in conformance with the Contract Documents.

B. Owner reserves the right to award all or portions of the work included in the bid documents following evaluation of the bids and in accordance with Owner's budget.

C. Perform Work of Contract under Unit Price Contract with Owner in accordance with Conditions of Contract.

1.3 CONTRACTOR'S USE OF SITE AND PREMISES

A. Access to Site:
   1. Local Residents
   2. Service Providers
      a. Mail Carriers
      b. Parcel Delivery by Private Carriers
      c. Refuse and Recycling Collection
      d. Brush and Yard Waste Collection
   3. Emergency Services
   4. Work by Others.

B. Construction Operations: Limited to areas noted on Drawings. Specifically;
   1. Private Site or public right-of-way limits
   2. Permanent Easements obtained for installation of utilities and permanently constructed streets and facilities.
   3. Temporary construction easements obtained for grading and restoration of the work site.

C. Time restrictions for performing work: 7 am – 7 pm Monday through Friday; 8 am – 7 pm Saturday or per individual municipal ordinance.

D. Utility Outages and Shutdown: Provide minimum of 48 hours notice prior to service interruption.

1.4 WORK SEQUENCE

A. Sequence Work as follows:
1. Install erosion control measures.
2. Place traffic control measures.
3. Remove trees and grub brush through project.
4. Rough grade site.
5. Remove existing curb and pavements for utility extensions/connections.
6. Install proposed sewer, water and storm sewer utilities.
7. Grade street to subgrade elevation.
8. Complete testing of installed utilities.
9. Proof roll and complete Excavation Below Sub-grade (EBS) as required.
10. Backfill EBS with Dense Aggregate Base Course.
11. Remove Excess Material from Site.
12. Install new curb & gutter
13. Place new Pavement.
14. Install new sidewalk.
15. Restore area.

1.5 PERMITS

A. Permits Obtained by Owner or Owner's Representative:
1. City of Stoughton Approval – Date of Approval
2. Stormwater Management (WDNR, Local) – Date of Approval, Permit No.:
3. Erosion Control (WDNR, Local) – Date of Approval, Permit No.:
4. Stoughton Utilities Approval – Date of Approval
5. Public Sanitary Sewer Main Extension (WDNR) – Date of Approval, Permit No.:
6. Public Water Main Extension (WDNR) – Date of Approval, Permit No.:
7. Regional Planning Commission Approval – Approved August 6, 2020

B. Permits Obtained by Contractor:
1. Street Opening Permit from City of Stoughton;
2. Utility Connection Permit from City of Stoughton;
3. Permits for installation of dewatering wells;
4. Other permits as required to execute the work.

C. Posting Permits and Notifications
1. Post permits and wage rate documents when required in a visible location on the job site. Laminate or sufficiently waterproof posted materials to protect from the weather.
2. Post documents in the same location used by the Owner for posting public notices when a suitable work site location is not available.

1.6 SPECIFICATION CONVENTIONS

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Application for Payment

B. Change Procedures

C. Defect Assessment

D. Unit Prices

E. Alternates

1.2 APPLICATIONS FOR PAYMENT

A. Submit three copies of each application on form provided by the Engineer.

B. Content and Format: Utilize Unit Price Bid Items for listing items in Application for Payment.

C. Payment Period: Submit applications for payment once per month. Payments will be reviewed by the Village Board which meets the first and third Tuesday of each month. Submit application for payment no later than the 20th day of the month for which payment is being requested.

D. Substantiating Data: When Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
   1. Partial release of liens from major subcontractors and vendors.
   2. Record documents for review by Owner which will be returned to Contractor.
   3. Affidavits attesting to off-site stored products.
   4. Payroll information.

1.3 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy.

C. The Engineer will advise of minor changes in the Work not involving adjustment to Contract Price or Contract Time by issuing supplemental instructions.

D. The Engineer may issue a Notice of Change including a detailed description of proposed change with supplemental or revised drawings and specifications, a change in Contract Time for executing the change with stipulation of overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 3 days.

E. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors.

F. Stipulated Price Change Order: Based on Notice of Change and Contractor's fixed price quotation or Contractor's request for Change Order as approved by engineer.

G. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute Work under Construction Change Directive. Changes in Contract Price or Contract Time will be computed as specified for Time and Material Change Order.

H. Work Directive Change: Engineer may issue directive, on EJCDC C-940 Work Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Price or Contract Time. Promptly execute change.

I. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will determine change allowable in Contract Price and Contract Time as provided in Contract Documents.

J. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.

K. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.

L. Change Order Forms: EJCDC C-941 Change Order.

M. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

N. Correlation of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise Progress Schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of Work affected by the change, and resubmit.
3. Promptly enter changes in Record Documents.

1.4 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Engineer, it is not practical to remove and replace the Work, the Engineer will direct appropriate remedy or adjust payment.

C. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.

D. Authority of Engineer and Owner to assess defects and identify payment adjustments is final.

E. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:
1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products placed beyond lines and levels of the required Work.
4. Products remaining on hand after completion of the Work.
5. Loading, hauling, and disposing of rejected products.

1.5 UNIT PRICES

A. Engineer will take measurements and compute quantities accordingly. Provide assistance in taking of measurements.

B. Unit Quantities: Quantities and measurements indicated on Bid Form are for Contract purposes only. Actual quantities provided shall determine payment.
1. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at contracted unit prices.

2. When actual Work requires 25 percent or greater change in quantity than those quantities indicated, Owner or Contractor may claim a Contract Price adjustment.

C. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, off-site disposal, services and incidentals; erection, application or installation of item of the Work; overhead and profit.

D. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Engineer multiplied by unit price for Work incorporated in or made necessary by the Work.

E. Measurement of Quantities:
   1. Weigh Scales: Inspected, tested and certified by applicable State weights and measures department within past year.
   2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
   3. Metering Devices: Inspected, tested and certified by applicable State department within past year.
   4. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
   5. Measurement by Area: Measured by square dimension using mean length and width or radius.
   6. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
   7. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

F. Unit Price Schedule:
   1. Refer to Bid Form

1.6 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement. The Owner-Contractor Agreement may identify certain Alternates to remain an Owner option for a stipulated period of time.

B. Coordinate related Work and modify surrounding Work. Description for each Alternate is recognized to be abbreviated but requires that each change shall be complete for scope of Work affected.
   1. Coordinate related requirements among Specification Sections as required.
   2. Include as part of each Alternate: Miscellaneous devices, appurtenances, and similar items incidental to or necessary for complete installation.
   3. Coordinate Alternate with adjacent Work and modify or adjust as necessary to ensure integration.

C. Schedule of Alternates:
   1. Refer to Bid Form

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and Project conditions.

B. Field Engineering.

C. Preconstruction meeting.

D. Protection of Existing Structures and Utilities.

E. Permits.

F. Right of Way and Construction Easements.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.

C. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion.

D. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

E. The contractor shall notify the engineer not less than three (3) working days prior to the date of commencement of work.

F. The contractor shall give notice to the fire and police departments of the municipality in which the work is being performed and/or to the sheriff's department at least twenty-four (24) hours before closing off or in any manner affecting through vehicular traffic of any street.

G. Contractor shall be responsible for coordinating all construction activities with utility companies including but not limited to electric, gas, telephone, cable, communication, etc., as well as service companies (mail, trash collection, etc.) in the work area. This work

including sub-surface investigations to determine utility locations shall be incidental to all other construction.

H. The locations of utilities shown on the Plans are from existing records and/or field locations and may not be complete or accurate. The contractor shall contact Digger's Hotline at (800) 242-8511, as well as other utilities not served by Digger's Hotline but having facilities in the work area, at least three (3) full business days prior to construction to allow the utilities to locate their underground facilities.

I. Contractor shall be responsible for locating all utilities, including but not limited to sewer, water, electric, telephone, cable television, and gas and repairing any damage he shall cause to the same. The Contractor shall, in writing, bring to the attention of the engineer the location of any utilities that interfere with the proposed construction. Notwithstanding, contractor shall be responsible for any damage he shall cause to the same.

J. Utility Outages and Shutdown: No sanitary or water service shall be disconnected or otherwise disrupted without prior authorization from the Owner. The contractor shall notify the Owner no less than forty-eight (48) hours in advance of any disruption of service so that the Owner may notify affected property owners.

K. An engineer or an engineer technician will provide construction review as the project proceeds to determine conformity to the contract accounts. Said construction review shall not relieve the contractor of any obligation to construct the project in conformity with the Contract Documents, nor shall it, in any manner, make Vierbicher Associates, Inc., an insurer of, nor relieve the contractor of any obligations or guarantees concerning the contractor's performance.

L. The General Contractor shall provide the Owner and Engineer with a list of emergency contacts.

M. Utility Contacts

| | | |
|---|---|---|
| 1. | Digger's Hotline | (800) 242-8511 |
| 2. | Gas - Alliant Energy (Nicholas Dachniwskyj) | (608) 877-1643 |
| 3. | Telephone – AT&T (Brian Scholz) | (608) 282-6899 |
| 4. | Electric - Stoughton Municipality Utilities (Jill Weiss) | (608) 877-7423 |
| 5. | Cable TV - Spectrum (Kyle Smith) | (608) 575-1937 |
| 6. | Water Works – Stoughton Municipality Utilities (Jill Weiss) | (608) 877-7423 |
| 7. | Sanitary – Stoughton Municipality Utilities (Jill Weiss) | (608) 877-7423 |
| 8. | OWNER – City of Stoughton (Rodney Scheel) | (608) 873-6619 |

1.3 FIELD ENGINEERING

A. When included in Engineer's contract with Owner, Engineer will provide one time staking for each utility line, grading, curb and gutter. The Contractor shall provide the Engineer a 48 hour notice prior to the time the Contractor needs stakes. Any restaking needed after the initial staking has been completed shall be charged to the Contractor on a time and materials basis.

B. The contractor shall check the accuracy of line and grade stakes by means of visual and taping checks and shall be responsible for the protection and preservation of such stakes.

C. The contractor shall bear sole responsibility for the correct transfer of all construction lines and grades from the primary line and grade points, and for the correct alignment and grade of the finished structure, based upon the primary line and grade established by the engineer.

D. Control survey that is established by Owner provided survey shall be the responsibility of the contractor to maintain and protect unless approved otherwise by Engineer or Owner.

E. Contractor shall confirm drawing dimensions and elevations.

F. Contractor shall protect survey control points prior to starting site work; preserve permanent reference points during construction.

G. Promptly report to Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

H. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Engineer.

1.4 PRECONSTRUCTION MEETING

A. Engineer will schedule and conduct meeting after Notice of Award and prior to start of construction.

B. Attendance Required: Owner, Engineer, and Contractor. Utility representative will also be invited. Prime Contractor shall invite sub contractors as necessary.

C. Minimum Agenda:
   1. Execution of Owner-Contractor Agreement, if not already completed.
   2. Submission of executed bonds and insurance certificates, if not already completed.
   3. Distribution of Contract Documents, if not already completed.
   4. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing parties in Contract, Owner and Engineer.
   6. Communication procedures.

7. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
8. Scheduling.
9. Critical Work sequencing.
10. Other items may be included

D. Engineer shall record minutes and distribute copies to participants.

1.5 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. All surface structures and features that are to be saved, including buildings, pavements, trees and shrubs, shall be properly protected against all damage. Unless otherwise denoted on the drawings, the CONTRACTOR shall assume all existing buildings, fences, trees and shrubs, etc. are to be saved.

B. All existing gas pipes, water pipes, steam pipes, electric and telephone conduits, sewers, drains, fire cisterns and hydrants, and other surface or subsurface structures, either of a private or of public ownership, shall be carefully supported and protected from damage by the Contractor. The Contractor shall contact utilities to determine their procedure and schedule for supporting and/or relocating poles and shall notify any above ground utility as necessary to relocate or reinforce any poles, ties or anchors which may be on or near the line of the proposed utility, weakened by excavation for the proposed utility, or within road construction grading limits. All such work shall be done by or at the expense of the Contractor and according to his own plans, subject always to the approval of the Engineer. The fact that the Owner may be under no legal obligation to provide for doing such work will be no excuse for the Contractor neglecting or refusing to perform the same.

C. In the event of damage to any of these surface or subsurface structures, the Contractor shall replace or make repairs to the satisfaction of the Engineer at no additional cost to the Owner.

D. The Contractor, while on this job, shall be solely responsible for the protection and/or replacement of all survey corners which exist throughout the area. These corners will be located and marked by the ENGINEER, upon request by the Contractor, prior to commencing his work. Any corners damaged by the Contractor shall be replaced by a Professional Land Surveyor at the Contractor's expense.

1.6 PERMITS

A. Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor unless otherwise stated below. Permits, licenses, and easements for permanent structures or permanent changes in existing facilities will be secured and paid for by the Owner, unless otherwise specified.

1.7 RIGHT OF WAY AND CONSTRUCTION EASEMENTS

A. The Contractor shall confine his operations to the limits of the right-of-way or construction easements as shown on the plans. Equipment shall at no times be stored or parked on private property without the written permission of the property owner. At the conclusion of the workday, equipment shall be parked on the project site or at such other location for which the Contractor has made arrangements.

B. No easements, permanent or temporary have been provided by the Owner unless such easements are shown on the plans.

C. Where easements are provided, the Contractor shall restrict operations to minimize damage within easements and shall use only that land which is reasonably necessary to conduct his work operations.

D. Trees shall not be removed from within easement areas unless their removal is approved by the Engineer. The Engineer will mark all trees to be removed from easement areas.

END OF SECTION

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Definitions.

B. Submittal procedures.

C. Construction progress schedules.

D. Proposed product list.

E. Product data.

F. Use of electronic CAD files of Project Drawings.

G. Shop Drawings.

H. Test reports.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical Samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with Engineer accepted form.

B. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.

C. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

D. Schedule submittals to expedite Project, and deliver to Engineer at business address or electronic submittals via email as PDF electronic files. Coordinate submission of related items.

E. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

F. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.

G. Allow space on submittals for Contractor and Engineer review stamps.

H. When revised for resubmission, identify changes made since previous submission.

I. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

J. Submittals not requested will not be recognized nor processed.

K. Incomplete Submittals: Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Comply with Section 01 32 16 – Construction Progress Schedule.

1.5 PROPOSED PRODUCTS LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.6 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Engineer for review for limited assessing conformance with information given and design concept expressed in Contract Documents.

B. Submit electronic submittals via email as PDF electronic files.

C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

E. After review, produce copies and distribute according to “Submittal Procedures” Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
   1. Use of files is solely at receiver's risk. Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
   2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
   3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
   4. Receiver shall not hold Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
   5. Receiver shall understand that even though Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
   6. Receiver shall not hold Engineer responsible for such viruses or their consequences, and shall hold Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.8 SHOP DRAWINGS

A. Shop Drawings: Submit to Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.

B. Submit electronic submittals via email as PDF electronic files.

C. When required by individual specification sections, provide shop drawings signed and sealed by professional engineer responsible for designing components shown on shop drawings.
   1. Include signed and sealed calculations to support design.
   2. Submit drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
   3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

E. Use of Salvaged Materials
   1. With the exception of normal suitable fill materials, Contractor shall not use salvaged materials in the proposed construction without the prior written approval of the

Owner. It is intended that new, high-quality materials be used in the proposed construction.

1.9 TEST REPORTS

A. Submit for Engineer's knowledge as contract administrator or for Owner.

B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 35 00

SPECIAL PROCEDURES (SPECIAL PROVISIONS)

1. GENERAL

A. Items and instructions as given in these SPECIAL PROCEDURES shall take precedence over information as given in the Technical Specifications.

B. The State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, current Edition including all Supplemental Specifications, will be referenced in these specifications for roadwork performed on this project. The DOT Specifications will govern for street construction if a specific item is not covered in the Technical Specifications.

It is the responsibility of the Contractor to obtain copies of the DOT Specifications. A copy may be obtained from:

Wisconsin Department of Transportation
Central Office Construction, Room 601
P.O. Box 7916
Madison, WI 53707-7916

Or from the web at http://roadwaystandards.dot.wi.gov/standards/

C. The "Standard Specification for Sewer and Water Construction in Wisconsin", Sixth Edition, will be referenced in these specifications for utility construction performed on this project. The Wisconsin Specifications will govern for utility construction, if a specific item is not covered in the Technical Specifications.

It is the responsibility of the Contractor to obtain copies of the Wisconsin Specifications. A copy may be obtained from:

Public Works Improvement Program
2835 N. Mayfair Road
Milwaukee, WI 53222

D. Application For Payment

The CONTRACTOR shall submit Applications for Payment in conformance with the General Conditions and Agreement. Applications for Payment shall be submitted on a form supplied by the ENGINEER.

2. STREET SIGNS AND POSTS

A. Description

This work shall consist of furnishing and erecting street signs and posts along with the necessary hardware where shown on the plans or directed by the engineer.

B. Materials/Products

All signs shall be in conformance with the Manual on Uniform Traffic Control Devices (MUTCD).

The following signs shall be required:

- Stop Sign, R1-1 30" x 30"
- Street name signs consisting of two single sided embossed green reflective background with white lettering, 0.40 gauge steel for each street.
    - Provide the following street name signs:
        - Abel Court / Lincoln Avenue

Sign posts shall be square signposts with 4-sided mounting and breakaway system including all mounting hardware. Street name signs shall be on the same posts as the stop signs.

C. Construction/Installation

Sign installation shall conform to the Manual on Uniform Traffic Control Devices. The bottom of the signs shall be 7 feet from the ground. Posts shall be installed 3 feet deep. Signs shall generally be located 2 feet off from the face of the curb.

D. Basis of Payment

Street Signs and Posts shall be measured and paid for at the contract unit price per each type as noted on the bid form. This will cover both street signs and posts. This price will be payment in full for all materials (posts, hardware, and signs), labor, and equipment necessary to complete the work in accordance with the Contract Documents.

3. RESTORATION

A. Description

This work shall consist of fine grading in restoration areas, placing seed, fertilizer, and mulch in all disturbed areas as noted on the plans or as directed by engineer. This work shall include restoration of the street ROW following sidewalk construction.

Work shall also include placing any necessary topsoil in the terrace area between the sidewalk and curb following sidewalk construction and restoring with seed, fertilizer, and erosion mat.

B. Materials

Materials for lot and terrace restoration shall conform to the following:

1. Topsoil and salvaged topsoil shall conform to Section 31 05 13 of these specifications.

2. Seed mixture shall be DOT Seed Mix #40.

3. Fertilizer shall conform to Section 32 92 19 of these specifications.

4. Mulch used shall conform to Section 32 92 19 of these specifications.

5. Erosion Mat shall be Class I, Type A Urban per WisDOT P.A.L.

Seeding rates and methods shall be as shown on the plans.

C. Construction

Construction of restoration shall be as follows:

1. Topsoil and salvaged topsoil shall be placed to a minimum depth of 6" in terraces and lots. Excess topsoil material shall be placed in lots. Topsoil excavation shall be in accordance to Section 31 23 16 of these specifications.

2. Seeding shall be placed in accordance to Section 32 92 19 of these specifications. The sowing rate shall be 2 pounds per 1000 square feet of area for Seed Mixture No. 40. Seed rates and methods for the native seed mixes shall be per manufacturers recommendations.

3. Fertilizer shall be placed in accordance to Section 32 92 19 of these specifications. Fertilizer shall be applied at a rate of 7 pounds per 1000 square feet.

4. Mulch shall be placed in accordance to Section 32 92 19 of these specifications. Much shall be placed at a rate of approximately 100 pounds per 1000 square feet.

   Restoration shall be completed once the substantial amount of grading has been completed.

D. Basis of Payment

Restoration-Seed, Fertilizer & Mulch (Lots) will be measured and paid for at the contract unit price per square yard, which price shall be full compensation for fine grading, placing seed, fertilizer, and mulch in areas disturbed by the work as determined by the Engineer; for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Restoration-Seed, Fertilizer & Erosion Mat (Terrace) will be measured and paid for at the contract unit price per square yard, which price shall be full compensation for placing topsoil, fine grading, placing seed, fertilizer, and erosion mat between the curb and sidewalk; for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

4. COMMON EXCAVATION

A. Description

This work shall conform to Section 31 23 16 of the specifications except as specified below. Work shall consist of excavating as required following topsoil removal to the elevations shown on the plans and placement of all materials as

necessary in conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans.

Topsoil stripping, stock piling and re-spreading shall be paid for separately under the items listed on the bid form or as described in these special provisions.

Finish grading in prep of stone base shall be paid for separately under the items listed on the bid form.

Excess material may be disposed of on site at a location determined by the Engineer.

B. Materials

Excavated material used for fill shall consist of satisfactory soil or a mixture of satisfactory soil, stone, gravel, or other acceptable materials, which is of the character and quality for the purpose intended. Fill material shall be free from sod, stumps, logs, shrubs, and other perishable or deleterious matter.

C. Construction Methods

Common excavation material (excluding topsoil) shall be used as fill to subgrade of road and in lot areas designated for topsoil stripping. Remaining excess material shall be placed on site as directed by the Engineer.

All fill material shall be consolidated. Fill material shall be placed in lifts not exceeding 6-inches.

Fill material beneath right of way areas and within 5 feet of the right of way shall be consolidated as follows; within 3 feet of the surface 95% of maximum dry density, below 3 feet from the surface to 1-foot above the pipe 90% of maximum dry density.

Backfill material beneath areas out of the right of way shall be consolidated to a compaction density of a minimum of 90% of maximum dry density, as determined by the Modified Proctor Test (ASTM D1557).

Consolidation shall be achieved as specified. Mechanical compaction shall be used to consolidate backfill material. Jetting and flooding of fill material shall not be accepted. Any backfill found to be deficient in meeting the mechanical compaction specification shall be re-excavated and re-consolidated at the Contractor's expense. The costs of retesting backfill consolidation found to be deficient shall be paid by the Contractor.

Contractor shall provide temporary drainage and efficient management of surface water runoff to reduce the flow of storm water runoff into site excavations and construction areas.

D. Basis of Payment

Common excavation shall be paid for on a cubic yard basis and shall include excavating as required following topsoil removal to the elevations shown on the

plans, and placement of all materials as necessary in conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans.

Topsoil stripping, stock piling and re-spreading shall be paid for separately under the items listed on the bid form. Finish grading in prep of stone base shall be paid for separately on a lineal foot basis.

These prices shall be full compensation for excavation, excavation, loading, hauling and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

5. PIPE

The following pipe materials shall be used on the Project:

| Pipe Application | Material |
|---|---|
| Water Main | Ductile Iron Class 52 |
| Water Services and Piping for Miscellaneous Connections Such as to Pressure Gauges | Copper |
| Fittings for PVC and DI Pipe Used on Water Main | Ductile or Cast Iron |
| Sanitary Sewer and Laterals (15-IN DIA and Smaller) | PVC SDR 26 and SDR 35 ASTM D3034 |
| Storm Sewer | Reinforced Concrete Pipe (RCP), Class III min. |

6. IRON PIPE AND FITTINGS

Water main pipe material shall be Class 52 ductile iron as specified in Section 1.2.9.

All water main shall be provided with polyethylene encasement in accordance with ANSI/AWWA C105, 8 mil minimum thickness.

All water main shall be provided with continuity straps. CONTRACTOR shall furnish all equipment, labor, and miscellaneous items necessary to perform electrical continuity tests on all new water main installed. Tests shall be performed using an ohm meter to show that electrical continuity exists across all joints and fittings. CONTRACTOR shall make all necessary repairs to establish electrical continuity across joints, valves, and fittings. Costs shall be included in the unit price bid for water main.

All bolts for water main joints, fittings, and appurtenances shall be low alloy steel "blue bolts" with fluoropolymer coating.

7. PIPE RESTRAINT

Fittings are to be ductile iron as specified in Section 1.2.9. Fittings shall be mechanical joint Class 350 with joint restraint (Megalug) in addition to rodding or thrust blocking.

8 VALVES

The following valves shall be used on the Project:

| Valve Applications | Type |
|---|---|
| Water Main 12 inches | Resilient Wedge Gate Valves |

Water main valves shall be resilient wedge gate valves, Mueller A 2360 20 R.S. or American Flow Control Series 2500 R.S. Valve boxes shall be three piece cast iron, screw type, 5 1/4 inch shaft with nontip cover marked "WATER," Tyler 6860, or equal.

9. CORPORATION STOPS, CURB STOPS, AND TAPPING SADDLES

Water services shall be 1-inch diameter Type K copper tubing unless otherwise shown.

Corporation stops shall be H 15008. Curb stops shall be Mueller H 15209.

Curb boxes shall be Bingham and Taylor 4901-R with stationary rod, ring and pin, size 94-F with service box extension as needed. Lid shall be marked "Water."

All fittings shall be compression type.

Curb stops shall be located approximately mid-way between the curb and gutter unless otherwise requested by ENGINEER in the field. Avoid installing curb stops/curb box near gas mains.

10. FIRE HYDRANTS

Fire hydrants shall be Waterous Pacer WB 67. Color shall be red. Provide required bury length or barrel extensions to meet the elevations shown on the drawings. Fire hydrants shall be furnished with FlexStake 800 Series Marker flags. Marker shall be red in color and 48-inches in length.

11. PRECAST CONCRETE MANHOLES

Adjusting rings for new sanitary sewer manholes and for manhole casting replacements shall be round high-density polyethylene (HDPE) adjusting rings manufactured by Ladtech, Inc., or equal. All adjustment for matching street slope shall be accomplished using a molded and indexed slope ring of the same material. Provide approved butyl sealant between adjusting rings as recommended by manufacturer.

Mac wrap external joint wrap as manufactured by Mar Mac Manufacturing shall be installed on the exterior joints of all new sanitary sewer manhole sections. Joint wrap shall include internal securing straps and shall meet ASTM C 877 standards. Cost for joint wrap shall be included in the unit price bid for new manholes.

For sanitary sewer manholes with 6-inch pipe connections, provide cored hole and boot to accommodate future 8-inch pipe connection.

12. MANHOLE AND INLET CASTINGS

Sanitary sewer manhole castings shall be Neenah R 1550 A as specified in Section 1.7 with Type B self-sealing, nonrocking lid and concealed pick holes. Equivalent Neenah Low Profile castings shall be provided where noted on the drawings or requested by ENGINEER in field.

Storm sewer manhole castings shall be Neenah R-1550-A as specified in Section 1.7 with Type D open grate, non-rocking lid.

Inlet castings shall be Neenah R-3067 with Type L vane grates where grades exceed 1 percent and Type R grates where grades are less than 1 percent or a sump condition exists.
Existing castings shall be salvaged to OWNER.

13. FRAME/CHIMNEY SEAL

Internal-type chimney seals shall be installed in new sanitary sewer manholes as noted on the drawings or requested by ENGINEER in the field. Chimney seals shall be Cretex Specialty Products, or equal. Payment for chimney seals on new manholes will be made according to the unit price bid for manholes.

14. BEDDING AND COVER

Bedding and cover for ductile iron water main shall be Class B and shall conform to Gradation Size 57.

Bedding and cover for PVC sanitary sewer shall be in accordance with the Thermoplastic Pipe Bedding Detail on Drawing 01 975 43A and shall conform to Gradation Size No. 57.

15. CONNECTION TO EXISTING WATER MAIN

At location shown on the drawings, the new water main shall be connected to existing water main. Included in this work shall be the necessary excavation to expose the existing water main, installation of any fittings required in the existing and new main to allow the connections, installation of incidental water main, and all miscellaneous items of work necessary to complete the connection. New and existing mains shall be flushed immediately following connections. The location of existing main (in both plan and profile views) is approximate. CONTRACTOR shall locate existing mains prior to installing new mains to determine exact locations for line and grade of new mains. Connections of the new main to the existing main shall be made following testing and acceptance of the new main.

Request for water main depressurization should be made to the Stoughton Utilities Water Department. Advance notice of 48 hours will be necessary prior to the work. Existing valves and hydrants shall be operated only by utility personnel.

All costs for connections to existing water mains and related work shall be included in the prices bid for connect to existing water main.

16. SANITARY SEWER LATERALS

Stoughton Utilities has selected the 3M ScotchMark electronic Marker System as their standard for this purpose. This system consists of marker balls which after burial provide a signal that can be detected with underground utility locating equipment. Marker balls shall be ScotchMark Electronic Ball Marker Model #1404 XR. All marker balls shall be furnished by CONTRACTOR.

CONTRACTOR shall install a minimum of two marker balls per sanitary sewer lateral. Both markers shall be installed directly above the sanitary sewer lateral at a depth not exceeding 4 feet below finished ground surface. One marker shall be installed at the wye fitting on the sanitary sewer main and the other marker shall be installed above the sanitary sewer lateral at the right of way limits. Where applicable, markers shall also be installed at changes in direction of the sanitary sewer lateral. Markers shall be placed in accordance with the manufacturer's instructions.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control and control of installation.

B. Tolerances.

C. References.

D. Testing and inspection services.

E. Examination.

F. Preparation.

1.2 QUALITY CONTROL AND CONTROL OF INSTALLATION

A. Monitor quality control over site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

1.3 TOLERANCES

A. Monitor installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

## 1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. When specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.

E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

F. Comply with codes and standards applicable to each type of work and as listed in individual sections.
   1. Where a conflict occurs between referenced documents and the Project Specifications, the Project Specifications shall govern.
   2. Where conflicts occur between two or more referenced documents, the document containing the most stringent requirements governs.
   3. Where referenced documents are not specified by date, the current document published as the date set for Receipt of Bids applies.
   4. Materials, applications, and tests specified by reference to published standards of a society, association, code, ore other published standards are included in the specifications as if written in their entirety.

G. The following may be referenced in the Contract Documents for work on this project.
   1. *Standard Specifications for Sewer and Water Construction in Wisconsin*,
   2. State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*. This publication can be found at: http://roadwaystandards.dot.wi.gov/standards/stndspec/index.htm
   3. *Wisconsin Construction Site Best Management Practice Handbook, DNR Nonpoint Source and Land Management Section WR/2.*

## 1.5 TESTING AND INSPECTION SERVICES

A. Owner will employ and pay for specified services of an independent firm to perform testing and inspection unless otherwise noted in this document.

B. Cooperate with independent firm; furnish samples of materials, design mix, and assistance by incidental labor as requested.
   1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

C. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

D. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Engineer. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Price.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of correct characteristics, and in correct locations.

END OF SECTION

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SECTION 01 55 26

TRAFFIC CONTROL

PART 1 GENERAL

1.1 SUMMARY

A. Work includes furnishing and maintaining all signage, barricades, barrels, including flagmen, as necessary for traffic control.

B. Section Includes:
1. Vehicular Access.
2. Parking.
3. Traffic Regulation.
4. Barriers.
5. Traffic Maintenance.
6. Driveway Access.
7. Mail Delivery.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Traffic Control:
1. Basis of Measurement: By the Lump Sum. When no quantity is provided, it is incidental to the cost of construction.
2. Basis of Payment: Furnishing, installation, maintenance and removal of traffic control devices including flagging shall be paid for at the contract lump sum price as necessary to complete the work.

   If damage occurs to any adjacent street due to construction traffic, it shall be the responsibility of the Contractor to repair damaged streets.

1.3 REFERENCES

A. Manual on Uniform Traffic Control Devices (MUTCD).

B. State of Wisconsin Standard Specifications.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. A traffic control plan shall be submitted unless a detailed traffic control plan is already included in the plans.

C. Manufacturer's Certificate: Certify Products meet or exceed specified requirements for all materials.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), applicable sections of the State of Wisconsin Standard Specifications, and detail drawings. Furnish products of each type by single manufacturer unless specified otherwise.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.

PART 2 PRODUCTS

2.1 PRODUCTS

A. Traffic control devices shall be in accordance with the MUTCD and the State of Wisconsin Standard Specifications.

PART 3 EXECUTION

3.1 VEHICULAR ACCESS

A. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow.

B. Location as indicated on Drawings or approved by Engineer.

C. Provide and maintain access to fire hydrants and control valves free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Provide local residents access at all times unless prior arrangements have been made with those affected. Allow for emergency access at all times.

F. Provide driveway access over fresh concrete in special circumstance as directed by Engineer (Incidental).

3.2 TRAFFIC MAINTENANCE

A. Whenever the Contractor's activities obstruct through traffic, there shall be sufficient flagmen on duty to guide the traffic, and the Contractor shall furnish and install all temporary signing and barricades required to safely direct the traveling public around the obstructed area.
   1. As a minimum, suitable barriers shall be erected and maintained at each end of the obstructed section of roadway and at all affected roadway intersections.

2. All signing and barricades shall be in accordance with the latest revision of or supplement to Part VI, Traffic Controls for Construction and Maintenance Operations of the *Manual on Uniform Traffic Control Devices*, the Traffic Control Plan (if shown on the Plans) and Section 643 of the DOT *Standard Specifications*.
3. Whenever traffic on state or county highways is obstructed, the Contractor shall provide a minimum of two (2) flagpersons to direct traffic at each separate work location.
4. The Contractor shall provide access for garbage collection on those streets closed to through traffic by his construction activities for the duration of the project.

3.3 DRIVEWAY ACCESS

A. Access shall be provided at all times to existing residences and businesses within the project limits. If at any time during the construction period, it is necessary to temporarily interrupt access, the Contractor shall notify in writing, at least 24 hours in advance, the affected property owners, the Owner, and the Engineer, and coordinate all activities such that the interruption is agreeable to all parties affected.
   1. The Contractor shall construct temporary ramps at all driveways to provide access during construction.
   2. Access may be provided by constructing temporary drives and/or by placing steel plates over new concrete gutters.

3.4 TRAFFIC REGULATION

A. Signs, Signals, And Devices:
   1. Post Mounted and Barricade Mounted Traffic Control and Informational Signs: In accordance with State of Wisconsin Standard Specifications and Detail Drawings and Manual on Uniform Traffic Control Devices.
   2. Review all traffic signs and control devises furnished and erected for location, position, visibility, adequacy, and manner of use under specific job conditions immediately after each setup and at least once every 24 hours and more frequent as necessary.
   3. Traffic Control Signals: As approved by local jurisdictions.
   4. Traffic Cones and Drums, Flares and Lights: As approved by authority having jurisdiction.
   5. Flagperson Equipment: As required by authority having jurisdiction.

B. Flag Persons: Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes.

C. Flares And Lights: Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

D. Haul Routes:
   1. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.

E. Traffic Signs And Signals:
   1. Provide signs at approaches to site and on site, at crossroads, detours, parking areas, and elsewhere as needed to direct construction and affected public traffic.

2. Provide, operate, and maintain automatic traffic control signals to direct and maintain orderly flow of traffic in areas under Contractor's control, and areas affected by Contractor's operations.
3. Relocate as Work progresses, to maintain effective traffic control.

F. Removal:
1. Remove equipment and devices when no longer required at Substantial Completion.
2. Repair damage caused by installation.
3. Remove post settings to depth of 2 feet.

3.5 BARRIERS

A. The Contractor shall take all normal precautions and whatever special precautions are necessary to prevent the occurrence of an accident. These may include but are not limited to the posting of construction areas, placement of fences, warning lights, barricades and/or flagmen as deemed necessary.

B. Provide protection for plants designated to remain. Replace damaged plants.

C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

3.6 MAIL DELIVERY

A. The Contractor shall ensure that mail can be delivered to properties affected by his work operations in a reasonable and timely manner.

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout procedures.

B. Final cleaning.

C. Protecting installed construction.

D. Project record documents.

1.2 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.

B. Submit final Application for Payment identifying total adjusted Contract Price, previous payments, and amount remaining due.

1.3 FINAL CLEANING

A. Clean site; sweep paved areas, rake clean landscaped surfaces.

B. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Prohibit traffic from landscaped areas.

1.5 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

5. Reviewed Shop Drawings, Product Data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Field changes of dimension and detail.
3. Details not on original Contract drawings or as directed by the Engineer.

F. Submit documents to Engineer with claim for final Application for Payment.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 31 05 13

SOILS FOR EARTHWORK

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
1. Subsoil materials.
2. Topsoil materials.
3. Pipe Bedding Materials.
4. Engineered Soil Materials.

B. Related Sections:
1. Section 31 23 16 - Earthwork
2. Section 31 23 17 – Trenching and Backfilling.
3. Section 31 32 14 - Cement Soil Stabilization.
4. Section 31 32 15 - Lime Soil Stabilization.
5. Section 31 37 00 - Riprap.
6. Section 32 05 13 - Soils for Exterior Improvements.
7. Section 32 05 16 - Aggregates for Exterior Improvements.
8. Section 32 92 19 - Seeding and Soil Supplements.
9. Section 32 92 23 - Sodding.
10. Section 32 93 00 - Plants.
11. Section 33 46 00 - Subdrainage: Filter aggregate.

### 1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
5. ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils

C. Department of Natural Resources Technical Standards:
1. Bioretention for Infiltration (1004)
2. Compost (S100)

1.3 QUALITY ASSURANCE

A. Furnish each subsoil and topsoil material from single source throughout the Work.

B. Perform Work in accordance of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

PART 2 PRODUCTS

2.1 BEDDING AND COVER MATERIALS

A. Class I - Crushed stone consisting of clean (screened), hard, tough, durable, angular 3/8" to 1 ½" graded stone crushed from bedrock limestone, dolomite, granite or bank run gravel.

B. Class II - Coarse sands and gravels with maximum particle size of 1 ½" including well-graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW, and SP are included in this class, along with coarse-grained soils with less than 12% fines (P200).

C. Class III - Fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures with less than 30% fines (P200). Soil Types GM, GC, SM, and SC are included in this class.

2.2 SUBSOIL MATERIALS

A. Select Granular Backfill: Conforming to ASTM D2487 standard meeting soil classification groups; GW, GP, SW, SP, SM. Free of rocks larger than 3" in any dimension, debris, waste, frozen material, vegetation and other deleterious matte. Liquid Limit 40 or less and Plasticity Index of 40 or less. Material shall consist of durable particles ranging from fine to coarse in a substantially uniform combination. Some fine clay or loam particles are desirable, but they shall not be present in the form of lumps. Backfill material shall conform to the following grading requirements.

GRADING REQUIREMENTS FOR SELECT GRANULAR BACKFILL

| Sieve Sizes | Percentage by Weight Passing |
|---|---|
| 2 inches | 95 - 100 |
| No. 4 | 35 - 60 |
| No. 200 | 5 - 15 |

B. Native Backfill:
1. Excavated and re-used material to be used as backfill shall consist of a loam clay, or other materials which, in the judgment of the Engineer, are suitable for backfilling.
2. Graded.
3. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.

4. Unstable backfill materials include vegetable or other organic matter, all types of refuge, large pieces of fragments of concrete and such other material as in the judgment of the Engineer are unsuitable for backfilling.
5. Frozen material shall not be used for backfilling.

2.3 TOPSOIL MATERIALS

A. Trucked-In Topsoil :
1. Imported topsoil conforming to State of Wisconsin Department of Transportation standard, section 625.2.
2. Topsoil shall consist of natural loam, sandy loam, silt loam, silty clay loam, or clay loam humus-bearing soils adapted to sustain plant life.
3. Topsoil shall have a pH range of 6.0 to 7.0.
4. Topsoil shall have an organic content of at least 40%.
5. Reasonably free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds, and foreign matter.
6. Topsoil shall be subject to inspection upon delivery to site. Any unsatisfactory materials, as determined by the Engineer, shall be removed and replaced with materials conforming to these specifications.

B. Salvaged Topsoil :
1. Excavated and reused material consisting of loam, sandy loam, silt loam, silty clay loam or clay loam humus-bearing soils available from overlying portions of the areas to be disturbed.
2. Graded.
3. Free of roots, rocks, subsoil, debris, large weeds and foreign matter.
4. Conforming to ASTM D2487 Group Symbol OH.

2.4 ENGINEERED SOIL MATERIALS

A. Composition:
1. 70% to 85% sand well mixed with 15% to 30% compost
2. Mixture composition based on volume.

B. Sand for Engineered Soil:
1. USDA Coarse Sand (.02 - .04 inch)
2. ASTM C33 (Fine Aggregate Concrete Sand)
3. Wisconsin Standards and Specifications for Highway and Structure Construction 501.2.3.4 (Fine Aggregate Concrete Sand)
4. Manufactured Sand or stone dust is not allowed.
5. Wash and drain sand to remove clay and silt prior to mixing.

C. Compost for Engineered Soil:
1. Meet Wisconsin Department of Natural Resources Specification S100 Compost

D. Exclude rocks, stumps, roots, brush or other material over 1" in diameter.

E. Provide mixed material with a pH between 5.5 and 6.5

## 2.5 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services Testing and analysis of soil material.

B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698. ASTM D1557. (ASTM C136).

C. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698. ASTM D1557. (ASTM C136).

D. Testing and Analysis of Coarse Aggregate Material: Perform in accordance with ASTM D698, ASTM D1557, ASTM D4318, ASTM C136

E. When tests indicate materials do not meet specified requirements, change material and retest.

F. Furnish materials of each type from same source throughout the Work.

# PART 3 EXECUTION

## 3.1 EXCAVATION

A. Excavate subsoil and topsoil from areas designated. Strip topsoil to full depth of topsoil in designated areas.

B. Stockpile excavated material meeting requirements for subsoil materials and topsoil materials.

C. Remove excess excavated materials subsoil and topsoil not intended for reuse, from site.

D. Remove excavated materials not meeting requirements for subsoil materials and topsoil materials from site.

## 3.2 STOCKPILING / PLACING

A. Stockpile or place materials on site at locations indicated designated by Engineer.

B. Furnish material in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Stockpile topsoil 8 feet high maximum.

E. Prevent intermixing of soil types or contamination.

F. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

G. Stockpile unsuitable or hazardous materials on impervious material and cover to prevent erosion and leaching, until disposed of.

H. Place Engineered Soil with backhoe or end loader being careful not to compact placed material. After placement, protect from compaction by wheeled or tracked equipment.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

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SECTION 31 10 00

SITE CLEARING AND REMOVALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Site Clearing and Grubbing.
2. Remove Existing Trees.
3. Remove Existing Asphalt.
4. Remove Curb & Gutter.
5. Remove Existing Concrete.
6. Sawcut Asphalt and Concrete.

B. Related Sections:
1. Section 31 23 16 - Earthwork.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Site Clearing & Grubbing:
1. Basis of Measurement: By Lump Sum.
2. Basis of Payment: Includes clearing, grubbing, and disposal of trees, brush, stumps, and other vegetation.
3. If no price is stated in the Bid Form, Cleaning and Grubbing will be considered incidental to the other construction.

B. Remove Existing Trees:
1. Basis of Measurement: By Lump Sum or By Each as indicated on the Bid Form.
2. Basis of Payment: Tree Removal shall include removal and off-site disposal, including all labor, trucking, equipment, tools, and incidentals necessary to complete the work.

C. Remove Existing Asphalt:
1. Basis of Measurement: By Square Yard.
2. Basis of Payment: Removal of existing asphalt shall be full compensation for excavating existing asphalt, disposal of existing asphalt off-site, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

D. Remove Existing Curb & Gutter:
1. Basis of Measurement: By Lineal Foot.
2. Basis of Payment: Removal and disposal of curb and gutter off-site, and for labor, tools, equipment, and incidentals necessary to complete the work.

E. Remove Existing Concrete:
1. Basis of Measurement: By Square Foot.

2. Basis of Payment: Removal and off-site disposal of sidewalk, driveway aprons, and driveways, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

F. Sawcut Asphalt:
   1. Basis of Measurement: By lineal foot.
   2. Basis of Payment: Includes full compensation for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Payment will be made for final sawcut only. The Engineer will not measure overcuts beyond the limits the plans show or as the Engineer directs. There will be no compensation for additional sawcuts due to rolled pavement edges.

G. Sawcut Concrete:
   1. Basis of Measurement: By lineal foot.
   2. Basis of Payment: Includes full compensation for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Payment will be made for final sawcut only. The Engineer will not measure overcuts beyond the limits the plans show or as the Engineer directs. There will be no compensation for additional sawcuts due to rolled pavement edges.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Call Local Utility Line Information service not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

3.2 PROTECTION

A. Locate, identify, and protect utilities indicated to remain, from damage. Contractor shall coordinate with the Owner/Engineer prior to completing any removals.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

C. Protect bench marks, survey control points, and existing structures from damage or displacement.

D. Confine work to limits indicated on the plans.

## 3.3 SITE CLEARING AND GRUBBING AND TREE REMOVAL

A. Remove existing trees, shrubs, grass, and other vegetation, improvements, or obstructions, as required, for access to the site and execution of Work. Remove similar items elsewhere on site or premises as specifically indicated. Removal includes digging out and off-site disposal of stumps and roots.
   1. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
   2. Stumps may be removed by grubbing, chipping, or grinding.

B. Remove stumps and root system to a depth of 12 inches below finished grade.

C. Clear undergrowth and deadwood, without disturbing subsoil.

D. Apply herbicide to remaining stumps to inhibit growth.

E. Disposal of Elm Trees shall be in accordance with local regulations.

F. Prevent the spread of oak wilt by treating all cut surfaces and abrasions sustained between April 1 and September 30 by healthy oak trees and saplings with a thorough application of tree paint immediately upon discovering a wound. Between these dates, also paint the cut surfaces of the stumps of all healthy oak trees and saplings immediately after cutting, whether remaining in place or grubbed.

## 3.4 REMOVAL OF ASPHALT, CONCRETE, and CURB & GUTTER

A. All waste and debris shall be disposed of in compliance with State and local regulations, within five days of being cut or removed.

B. Remove paving, sidewalk, driveway, and curb and gutter as indicated on Drawings or as directed by the Engineer. Neatly saw cut edges at right angle to surface.

C. Existing asphalt shall be left in place as much as practical during underground utility construction. Pavement shall only be removed as necessary to excavate the trench for each utility line unless otherwise directed by the Engineer. Following completion of all underground utilities, the remaining asphalt shall be removed.

D. Continuously clean-up and remove waste materials from site. Do not allow materials to accumulate on site.

## 3.5 SAWING ASPHALT

A. Make straight, full-depth saw cuts at least 2 inches deep. Saw so the surface remaining is generally vertical over its full depth. Sawcut edges shall be protected. Only final sawcut will be paid for.

3.6 SAWING CONCRETE

A. Do not extend sawcuts into newly placed concrete pavement or into existing pavements more than 12 inches beyond the limits the engineer designates. Saw full-depth unless the plans indicate otherwise or the engineer directs or allows otherwise.

B. Removing sawing sludge after completing each saw cut. Minimize sludge on live traffic lanes. Remove sludge from all traffic control devises each day before dark. Dispose of sludge at an acceptable material disposal site or on Engineer-approved areas of the roadway or roadside.

END OF SECTION

SECTION 31 23 16

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

This work consists of the excavation and satisfactory disposal of all materials for the construction of the roadway, roadbed, embankments, earth subgrade and shoulders, intersections, side ditches and dikes, channels and waterways, and shall also include the grading of entrances, approaches, ditches and channels, in accordance with these specifications and in reasonably close conformity with the lines, grades, thicknesses and typical cross-sections shown on the plans or established by the engineer. Except when otherwise provided, this work shall also include the removal and satisfactory disposal of surface and base courses, surplus and unsuitable materials; the replacement of unsuitable material with satisfactory material; the trimming and finishing of the roadway; and maintaining such work in a finished condition until acceptance.

A. Section Includes:
   1. Topsoil Excavation.
   2. Topsoil Placement.
   3. Common Excavation.
   4. Borrow Excavation.
   5. Excavation Below Subgrade (EBS).
   6. Excavating Roadway, and Parking Areas.
   7. Excavating for Drainage & Embankments.
   8. Filling.
   9. Finish Grading.
   10. Placing Topsoil.
   11. Soil Compaction.
   12. Utility Line Opening (ULO).

B. Related Sections:
   1. Section 31 05 13 - Soils for Earthwork.
   2. Section 31 23 17 - Trenching.
   3. Section 31 23 18 - Rock Removal.
   4. Section 33 11 16 - Site Water Utility Distribution Piping.
   5. Section 33 11 13 - Public Water Utility Distribution Piping.
   6. Section 33 31 13 - Public Sanitary Utility Sewerage Piping.
   7. Section 33 31 00 - Sanitary Utility Sewerage Piping.
   8. Section 33 41 00 - Storm Utility Drainage Piping.
   9. Section 41 13 - Public Storm Utility Drainage Piping.
   10. Section 31 25 13 - Erosion Controls.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Topsoil Excavation:
   1. Basis of Measurement: By Cubic Yard or Lump Sum when indicated on the bid form.

2. Basis of Payment: Price shall be full compensation for excavating, loading, hauling, and temporary stockpiling the topsoil as required and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Work shall include removal and off-site disposal when required.
3. When no item is included in the bid form, stripping topsoil will be incidental to Common Excavation.

B. Topsoil Placement
1. Basis of Measurement: By Cubic Yard or Lump Sum when indicated on the bid form.
2. Basis of Payment: Price shall be full compensation for re-spreading the stockpiled topsoil to the required elevations and thicknesses and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.
3. When no item is included in the bid form, Topsoil Placement will be incidental to Common Excavation.

C. Trucked-In Topsoil:
1. Basis of Measurement: By the cubic yard as measured in the truck, when indicated on the bid form. Load tickets will be required.
2. Basis of Payment: This price shall be full compensation for supplying topsoil as required and for furnishing all labor, placement of material to the required elevations and thicknesses, equipment, tools, and incidentals necessary to complete the work.

D. Common Excavation:
1. Basis of Measurement: By cubic yard or Lump Sum as indicated on the bid form. When the contract uses a cubic yard measurement, payment of excavation will be in the original position, computed by the method of average end areas, with no correction for curvature, except where this method is not feasible and as hereinafter provided.
2. Basis of Payment: Prices shall be full compensation for excavation, disposal of all material not otherwise classified, including topsoil, surface, and base courses, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work. Topsoil Excavation and Topsoil Placement shall also be included in the cost of common excavation when no specific bid item is indicated for those items.
3. The cost of removing walls, foundations, etc., the satisfactory disposal of material resulting there from, and the backfilling of basements or openings resulting from the removal of walls, foundations, etc., for which no separate unit prices are included in the contract, will be construed to be included in the contract unit price for Common Excavation items, except as provided above for the removal of concrete structures. No extra or additional compensation will be made for such work, except that payment for furnishing and placing the required Granular Backfill will be made at the contract unit price for that item, and excavation below subgrade performed after completion of rough grading.

E. Borrow Excavation:
1. Basis of Measurement: By cubic yards when indicated on the bid form. The volume will be determined in its original position, computed by the method of average end areas, with no correction for curvature, or if the engineer elects, by the method of truncated prisms. The contractor shall notify the engineer sufficiently in advance of the time when excavation operations will be performed so as to permit accurate measurements of the borrow pit. Sod or other unsuitable material removed, or

material salvaged from borrow pits and used for covering surfaces of the excavated areas within such pits, as hereinbefore provided, will not be measured for payment. The engineer may require the contractor to remove topsoil or other unsuitable materials from the surface of the pit area prior to taking original cross-sections of the pit area and, upon completion of the excavation, to smooth or trim the pit, as require, to permit taking accurate final measurements of the area before the topsoil is replaced thereon. Any material excavated prior to the staking out and cross-sectioning of the borrow pit by the engineer, and all excavated material in excess of that required for or not incorporated in the work, will not be included in the quantity measured for payment.

2. Basis of Payment: Prices shall be full compensation for furnishing, clearing, grubbing, excavating, loading, hauling, sloping, shaping, placing, watering and dust abatement unless otherwise provided, compacting, disposing of surplus and unsuitable material; for salvaging, stockpiling, remanding and spreading approved salvaged material for covering surfaces of excavated areas within borrow pits; and for all labor, equipment, tools and incidentals necessary for completion of embankments and other portions of the work when sufficient quantities of satisfactory material for such purposes cannot be obtained from common excavation.

F. Excavation Below Subgrade:
   1. Basis of Measurement: By cubic yard when indicated on the bid form.
      When not indicated on the bid form and excavation below subgrade is performed after the rough grading operations are complete, unit price will be determined by multiplying the contract unit price bid for Common Excavation by three.
   2. Basis of Payment: Such price shall be full compensation for excavation and disposal of unsuitable materials off-site, and for furnishing all tools, labor, equipment, and incidentals necessary to complete the work.

G. Finish Grading in Prep of Stone Base:
   1. Basis of Measurement: By lineal foot when indicated on the bid form.
   2. Basis of Payment: The price shall be full compensation for completing the work as required and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

H. Utility line Opening
   1. Basis of Measurement: Each.
   2. Basis of Payment: The price shall be full compensation for the excavation required to expose the utility line, backfilling with existing material removed from the excavation, compacting the backfill material, restoring the site, cleanup and for labor, equipment, transportation, and incidentals necessary to complete the work. Removal necessary to facilitate ULO's shall be considered separate and measured and paid for separately as removal items. Replacement pavement, concrete curb and gutter and sidewalk items shall also be considered separate from ULO and shall be measured and paid for separately.

1.3 REFERENCES

A. Local utility standards when working in proximity of utility lines.

B. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

C. ASTM International:
   1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
   2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Samples: Submit, in air-tight containers, 10 lb sample of each type to testing laboratory when required or requested by Engineer.

C. Materials Source: Submit name and location of imported materials suppliers.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Furnish each material from single source though out the work.

B. Perform Work in accordance with State of Wisconsin Department of Transportation Standard Specifications.

PART 2 PRODUCTS

2.1 MATERIALS

A. Topsoil: Salvaged topsoil or trucked-In topsoil if indicated on the bid form as specified in Section 31 05 13.

B. Subsoil Fill: Native backfill as specified in Section 31 05 13.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify survey bench mark and intended elevations for the Work are as indicated on Drawings.

C. Verify building and trench backfilling have been inspected.

D. Verify substrate base has been contoured and compacted.

3.2 PREPARATION

A. Call Diggers Hotline Information service at 1-800-242-8511 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum.

C. Notify utility company to remove and relocate utilities.

D. Protect utilities indicated to remain from damage.

E. Protect plant life, lawns, rock outcropping and other features remaining as portion of final landscaping.

F. Protect bench marks, survey control point, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

A. Strip/Salvage Topsoil:
   1. Strip topsoil to whatever depths encountered or to depths necessary to provide sufficient volumes to cover designated areas to the required depths in a manner to prevent intermingling with underlying subsoil or other objectionable material. All areas from which topsoil is obtained shall be cleaned, if necessary, by means of mowing weeds or other vegetation to a height of approximately six inches or less. The area shall be free of any litter such as rocks, brush, or other material of objectional nature.
   2. Stockpile topsoil in storage piles in areas indicated or directed. Construct storage piles to provide free drainage of surface water.
   3. Stripped/salvaged topsoil may be stockpiled in areas designated on the plans or as directed by the Engineer so that it may be reclaimed and spread on the areas designated.
   4. Stockpile in area designated on site and protect from erosion with silt fence.

3.4 TOPSOIL PLACEMENT

A. All areas designated to be covered with topsoil shall be undercut or underfilled with approved material to such depth that when covered with the required depth of topsoil, the finished surface will be in accordance with the required lines, grades, slopes, and cross sections.

B. The finished surface shall contain no dirt clumps, stones, sticks, or other debris larger than one inch in any dimension. Topsoil placed next to fixed surfaces, such as walks, curbs, concrete sidewalks or other borders shall be kept 3/4 inch below such fixed surfaces.

C. Place topsoil in areas where restoration is required to a nominal depth of 4 inches unless otherwise indicated on the plans.

D. Place topsoil during dry weather.
   1. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.
   2. Remove roots, weeds, rocks, and foreign material while spreading.
   3. Manually spread topsoil close to plant material, building, and concrete or pavement to prevent damage.
   4. Lightly compact placed topsoil.
   5. Excess topsoil shall be disposed of off-site unless otherwise stated in the plans.
   6. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.5 TRUCKED-In TOPSOIL

A. Use when insufficient quantities of salvaged topsoil exist on site only with approval of Engineer.

B. Place topsoil according to TOPSOIL PLACEMENT item.

3.6 COMMON EXCAVATION

A. Common excavation shall consist of removal, satisfactory disposal, and placement of all materials of every description not otherwise classified on the bid form.

B. Excavate to in accordance to the lines, grades, thicknesses, and typical sections shown on the plans.

C. Provide temporary drainage and efficient management of surface water runoff to reduce the flow of storm water runoff into site excavations and construction areas.

D. Correct unauthorized excavation at no cost to Owner.

E. Any materials tracked on adjacent property or streets will be cleared immediately by the Contractor.

F. Excess material is to be disposed of off-site unless otherwise indicated.

## 3.7 PREPARING ROADWAY FOUNDATION

A. Vegetation of a height greater than one foot shall be cut and properly disposed of before ground is broken for excavation or before embankment is placed thereon. Heavy sod and other perishable material underlying proposed embankments within the limits of assumed one-to-one slopes extending outward from the outer limits of the finished shoulder line shall be removed. Muck, peat, and other unstable material shall be removed, disposed of, or otherwise treated as shown on the plans.

B. All suitable topsoil material from within the roadway limits shall be stripped and stockpiled or otherwise salvaged and stockpiled as shown on the plans or directed by the Engineer.

C. After suitable topsoil and required sod and other perishable or unsuitable materials have been removed, the ground underlying proposed embankments, within the limits of the assumed one-to-one slopes prescribed above, shall be compacted, or otherwise prepared as required to provide a foundation which will properly support the proposed embankment and which will permit attaining the density specified for the embankment.

D. All pavements, asphaltic surfaces, or rigid base courses occurring within the area of the roadbed slopes and underlying proposed embankments shall be completely removed to a depth of not less than 24 inches below the proposed finished grade line, or to such other depth as shown on the plans.

## 3.8 EXCAVATION BELOW SUBGRADE (EBS)

A. Excavation below subgrade shall consist of removal and satisfactory disposal of frost heave material, unstable soils, water bearing soil, topsoil containing unsatisfactory amounts of vegetation or other undesirable foundation material to such depths below the proposed finished earth grade as shown on the plans or as directed by the engineer. The undercut material shall be replaced with base course. The base course used to replace the undercut material will be paid for under the unit price for base course.

B. Slope the bottom of the excavation so that water is drained and does not accumulate in excavated area.

C. The sub-grade shall be proof-rolled with a loaded tri-axle dump truck to determine unsuitable materials.

D. Verify that the sub-grade is dry and in suitable condition to support paving and imposed loads. Notify Engineer of any unsatisfactory subsoil conditions.

E. Base course placement and paving shall not occur until these conditions have been corrected.

F. Remove and dispose of off-site all lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume.

G. Backfill shall be made from selected materials as called for on the plans or as directed by the Engineer.

H. Repair or replace items indicated to remain damaged by excavation.

3.9 ROADWAY GRADING

A. All suitable material removed from excavation shall be used in the construction of the roadway, as far as practicable, and at such other places as shown on the plans.

B. All excavated slopes or areas and all embankment slopes or areas, designated to be covered with topsoil or salvaged topsoil, shall be undercut or underfilled to the necessary depth to provide for the specified amount of topsoil or salvaged topsoil to be placed and finished to the required grade lines and section.

C. Excavating shall be so performed as to avoid removing or loosening any material outside the required slopes, and any such material, which may be removed or loosened, shall be replaced and thoroughly compacted to the required cross-section.

D. All intersecting roads, approaches, entrances, and driveways shall be graded as shown on the plans or as laid out in the field by the engineer. The work of constructing intersections and private entrances, trimming shoulders and slopes, finishing, and blading the earth subgrade and completing the ditches to proper alignment, grade and cross-section shall follow the rough grading closely.

E. Grading operations shall not be performed to the detriment of the work of trimming and finishing the roadway and blading and maintaining the roadbed and earth subgrade.

3.10 FINISH GRADING IN PREP OF STONE BASE

A. The grading, trimming, and finishing shall be completed prior to construction of the subbase, base, or surface courses. The Contractor shall regrade after all underground construction activities have ended.

B. Prepare and construct the foundation to uniform density throughout.

C. Unless otherwise specified, the foundation shall be compacted to not less than the density for standard compaction of the particular material existing in the foundation.

D. Excavate and backfill all soft or yielding areas, holes, or other defects that occur due to traffic, hauling, poor drainage, unstable materials, or from any other cause before placing the base as directed by the Engineer.

E. Construct the foundation by scarifying, blading, leveling, and rolling as required to bring the foundation to the required grade, cross-section, and density.

F. The foundation for base course shall be constructed using a machine designed specifically for trimming foundations. The machine shall utilize automatic sensors to trim to the required grade and cross-section.

G. After shaping and compacting, provide a smooth foundation for the full width of the roadbed, to the required lines, grade, cross-section, and density for base course laying operations.

H. The final street grade, which will be used for a base to install curb and gutter, stone base and bituminous pavement, shall be required to be within 0.05' of elevations given on the grade stakes.

I. During grading operations and pending acceptance or placement of subbase, base or surface course, the contractor shall provide continuous maintenance of the entire roadbed and perform all blading and repair work necessary to keep the grade smooth and to the required grade and cross section.

J. Washouts caused by erosion shall be refilled and properly compacted, and payment for such filling shall accrue only from additional volume of material used.

K. Remove snow or ice, if any, from the foundation before placing the base.

3.11 DRAINAGE AND EMBANKMENTS

A. DRAINAGE
   1. Inlets, outlets, swamp, berm and intercepting ditches, dikes, or intercepting embankments and channels shall be constructed where and as shown on the plans or where and as directed by the engineer and shall be maintained to the required section until acceptance. The work shall be performed in proper sequence with other work to provide adequate drainage and to minimize erosion and siltation.

B. EMBANKMENT
   1. Materials:
      a. Materials for embankment shall consist of approved materials and shall contain no logs, stumps, brush, or other perishable material. Humus-bearing soils, in excess of the quantity needed for salvaged topsoil requirements, and other soils not suitable for roadbed construction may be placed in the outside edges of the embankment, beyond the limits of an assumed one-to-one slope extending outward from the outer limits of the finished shoulder line. Frozen lumps of soil shall not be permitted to be placed in embankments inside the above designated assumed slope limits.
      b. Materials to be incorporated in the top 8-inches of earth embankments shall be free from large stone, rock and broken concrete or other materials, which would significantly affect scarifying, compacting and finishing the subgrade.
      c. Materials placed in those portions of embankments through which it is proposed to bore holes for or to drive piling shall contain no stone or broken concrete retained on a three-inch ring and shall be free from quantities of gravel, stone or broken concrete passing a three-inch ring, or other material which would significantly affect the boring of holes or driving of piling.
   2. Placing Layers
      a. Embankment shall be constructed in layers. The construction of an embankment shall begin at the lowest point of the fill below the grade, and shall be constructed in layers by spreading and leveling the material during placement. Individual layers shall be spread evenly to uniform thickness throughout and approximately parallel with the finished grade for the full width of the embankment, unless otherwise directed. The thickness of the layer shall be as necessary to secure the required compaction, generally not exceeding eight-inches.

## 3.12 COMPACTION

A. General:
   1. All embankments shall be compacted in accordance with the requirements for standard compaction unless special compaction is called for on the plans or in the contract.
   2. Embankment material shall not be compacted when the moisture content is such as to cause excessive rutting by the hauling equipment, or excessive displacement or distortion under the compacting equipment. Where such conditions exist, the materials shall be allowed to dry prior to compacting. When necessary, drying of such materials shall be accelerated by aeration or manipulation by means of blade graders, harrows, discs, or other appropriate equipment.
   3. When the embankment material does not contain sufficient moisture to compact properly, water shall be added in quantities deemed necessary to aid and accelerate and to secure effective compaction.
   4. Embankment materials which are placed outside the limits of an assumed one-to-one slope extending outward and downward from the outer limits of the finished shoulder line shall be compacted to a density not less than the density contemplated for standard compaction, except that the engineer may waive this density requirement for unstable materials permitted to be placed in embankments outside the above designated slopes.

B. Standard Compaction:
   1. The material for the embankment shall be deposited, spread, and leveled, as herein before provided, in layers generally not exceeding eight inches in thickness before compaction. Each layer of the embankment shall be compacted to the degree that no further appreciable consolidation is evidenced under the action of the compaction equipment. The required compaction shall be attained for each layer before any material for a succeeding layer is placed thereon.
   2. The compaction shall be performed by specialized compaction equipment, supplemented by hauling and leveling equipment routed and distributed over each layer of the fill to make use of the compaction afforded thereby; unless the engineer determines that the compaction attained by the use of only the hauling and leveling equipment is satisfactory and sufficient. Should the engineer determine that such compaction is satisfactory and sufficient, specialized compaction equipment will not be required. Should the engineer determine that the compaction is not satisfactory or sufficient, specialized compaction equipment shall be used to accomplish the compaction.
   3. Specialized compaction equipment shall include tamping rollers, pneumatic-tire rollers, vibratory rollers, or other types of equipment designed for compaction, which will produce the required results in the materials encountered and be subject to the approval of the engineer.
   4. Tamping rollers, when used for compaction, shall exert a weight of not less than 150 pounds per square inch of tamping surface on each tamping foot in a transverse row.
   5. Pneumatic-tire rollers or other equipment, when used for compaction, shall have a weight of not less than 150 pounds per linear inch of overall rolling width.

C. Special Compaction

1. Upon the properly prepared ground surface, the material for the embankment shall be deposited, spread and leveled, as herein before provided, in layers generally not exceeding eight inches in thickness before compaction, except that when the material being compacted is of a granular nature and the compacting equipment is adaptable for the purpose, the thickness of the layer may be increased to a maximum of 12-inches provided the required density is obtained. Each layer of the spread and leveled material shall be compacted, by means of suitable compaction equipment, to not less than the specified density before the succeeding layer is placed.
2. All embankment material placed within the limits of assumed one-to-one slopes extending outward and downward from the outer limits of the finished shoulder lines shall be compacted to not less than the density specified for the embankment and the embankment material placed outside such assumed slopes shall be compacted as specified in Subsection 3.9.A.
3. Embankments of six feet or less in height shall be compacted to at least 95 percent of maximum density for their full depth. Embankments over six feet in height shall have the top six feet compacted to not less than 95 percent of maximum density, and those portions more than six feet below the finished subgrade shall be compacted to at least 90 percent of maximum density, except that such portions occurring within 200 feet of a bridge abutment shall be compacted to 95 percent of maximum density.
4. The maximum density shall be determined in accordance with the Standard Method of Test for the Moisture-Density Relations of Soils, AASHTO Designation: T 99, Method C, with replacement of the fraction of material retained on the 3/4-inch sieve with No. 4 to 3/4-inch material. The density of compacted embankment material will be determined in accordance with the Standard Method of Test for Density of Soil-in-Place by the Sand-Cone Method, AASHTO Designation: T 191 or by other approved methods.

D. Subgrade Compaction in Cuts
1. The finished earth subgrade in cut sections for a width equal to the width of the proposed pavement plus shoulders shall be compacted as provided for standard compaction, unless special compaction is called for in the contract.
2. On grading projects where special compaction is required, the finished earth subgrade in cut sections to the width above described and to a depth of at least six inches shall be compacted to at least 95 percent of maximum density.

3.13 Utility Line Opening (ULO)
1. The work consists of excavating to uncover utilities for the purpose of determining elevation and potential conflicts as shown on the plans or as directed by the engineer. Perform the excavation in such a manner that the utility in questions is not damaged and the safety of the worker is not compromised. Perform the utility line openings as soon as possible and at least 10 days in advance of the proposed utility construction to allow any conflicts to be resolved with minimal disruption. Where utilities are within 6 feet of each other at a potential conflict locations, only one ULO shall be called for. In these cases, a single utility line opening will be considered full payment to locate multiple utilities. Utility line openings shall include a trench up to 12 feet long as measured at the trench bottom, and of any depth required to locate the intended utility. All ULO's shall be approved and coordinated with the engineer.

Notify the engineer of this work a minimum of 3 days prior to the work so they may be present when the work is completed.

3.14 BORROW EXCAVATION

A. Quality
   1. The material furnished shall consist of satisfactory soil or a mixture of satisfactory soil, stone, gravel, or other acceptable materials, which is of a character and quality satisfactory for the purpose intended. The material shall be free from sod, stumps, logs, grubs, and other perishable and deleterious matter.

B. Source
   1. Unless otherwise provided in the contract, the contractor shall make his own negotiations with property owners or others from whom he proposes to obtain borrow material.

C. Construction Methods
   1. The area from which material for Borrow Excavation is to be obtained shall be cleared and grubbed. All sod or other perishable or unsuitable material shall be removed from the proposed pit area. Borrow pits shall be excavated in a manner to permit accurate measurement of the material excavated and incorporated in the work.
   2. All stone, broken rock, boulders, and other materials, which are not satisfactory for use in the work, shall be disposed of by the contractor at his expense.
   3. All stumps, trees, logs, brush, tops and other debris resulting from clearing and grubbing work in borrow pit areas shall be disposed of by the contractor.
   4. Except in the case of commercial pits, the available topsoil or other soil of a nature conducive to plant growth, overlying such pit, shall be stripped off and placed in stockpiles in sufficient quantities to cover all surfaces of excavated areas within such pit to a depth of from four to six inches. When the depth of topsoil overlying such pit is less than four inches in depth, the topsoil shall be replaced to the original depth. After the pit has been trimmed and finished, such salvaged material shall be uniformly spread over all excavated areas of the borrow pit, except as otherwise authorized by the engineer in writing.
   5. After the excavated areas of the pit have been topsoiled the pit, disturbed areas adjacent thereto and associated haul roads shall be fertilized and seeded.

3.15 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Compaction testing will be performed in accordance with ASTM D1557 by Owner.

C. Owner, at their discretion, to perform in place compaction tests in accordance with the following:
   1. Density Tests: ASTM D2922.
   2. Moisture Tests: ASTM D3017.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Frequency of Tests: As determined by Owner.

3.16 PROTECTION

A. Prevent displacement or loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent freezing.

C. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

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SECTION 31 23 17

TRENCHING AND BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Excavating trenches for utilities including services as indicated on the plans.
2. Compacted fill from top of utility bedding to subgrade elevations.
3. Backfilling and compaction.
4. Rock Excavation

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork: Soils for fill.
2. Section 31 23 16 - Earthwork
3. Section 33 11 13 - Public Water Utility Distribution Piping.
4. Section 33 31 13 – Public Sanitary Utility Sewerage Piping.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Trenching:
1. Basis of Measurement: Trenching will not be paid for separately but is incidental to pipe installation.
2. Basis of Payment: Included in the price of the pipe.

B. Native Backfill:
1. Basis of Measurement: No payment will be made for native backfill. Native backfill shall be included in the per foot unit costs of each item it is installed with.

C. Select Granular Backfill:
1. Basis of Measurement: By cubic yard as measured in the truck. Load tickets will be required.
2. Basis of Payment: Includes full compensation for furnishing all materials, delivery to site hauling and disposing of unsuitable materials off-site, compaction, tools, equipment, labor, and incidentals necessary to complete the work in accordance with the Contract Documents.

   Cover material, which is placed around the pipe and brought up to a point at the top or above the pipe barrel as shown in the standard drawings, is an integral part of the pipe section and will not be considered as part of the backfill area. Pay depths for backfill, when ordered as an extra, shall extend from the pavement, or surfacing subgrade down to the top of the cover material or concrete section.

D. Rock Excavation:
1. Basis of Measurement: Rock excavation in ledges and solid masses by the cubic yard acceptably completed when called out on the bid form.

2. Basis of Payment: Includes excavating rock to required elevations, protecting excavation, and stockpiling excavated materials removing excavated materials from site. Over Excavating: Payment is not made for over excavated work nor for replacement materials. Material that can be removed with a 100,000 pound backhoe with ripping teeth shall not be considered rock excavation.

E. Bedding and Cover:
Basis of Measurement: No payment will be made for bedding and cover material. Bedding and cover material shall be included in the per foot unit costs of each item it is installed with.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:
1. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
2. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
4. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
5. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
6. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.4 DEFINITIONS

A. Utility: Any buried pipe, duct, conduit, or cable.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Excavation Protection Plan: When required, describe sheeting, shoring, and bracing materials and installation required to protect excavations and adjacent structures and property; include structural calculations to support plan.

C. Product Data: Submit data for geotextile fabric indicating fabric and construction.

D. Samples: Submit, in air-tight containers, 10 lb sample of each type of Type fill to testing laboratory.

E. Materials Source: Submit name of imported fill materials suppliers.

F. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with State of Wisconsin Department of Transportation or Standard Specifications for Sewer and Water Construction in Wisconsin.

B. Perform Work in accordance of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

1.7 QUALIFICATIONS

A. Prepare excavation protection plan under direct supervision of Competent Person experienced in design of this Work and comply OSHA standard 1926.650 Excavation.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify Work associated with lower elevation utilities is complete before placing higher elevation utilities.

1.9 USE OF EXPLOSIVES

A. The Contractor shall observe the utmost care in the use of explosives so as not to endanger life and property. The methods of use, storing and handling of explosives and highly inflammable materials shall conform with applicable Federal, State and local laws and regulations including the rules of the Department of Safety and Professional Services (Wisconsin Administrative Code Chapter SPS 307).
   1. When blasting operations are conducted in communities, the shots shall be designed and initiated by a properly licensed Class 4 or 5 blaster.
   2. Blasting operations in communities shall comply with all local regulations and Contractor shall obtain necessary permits.
   3. Any person conducting blasting operations in a community shall notify the Engineer, Department of Safety and Professional Services, the local fire department, and the local law enforcement agency of the time and location of the blast.
   4. The Contractor is responsible to assure that the works to be accomplished are covered by insurance to an extent ample to cover any and all claims, damage, liabilities, awards or costs which might derive from or be attributable to such works or any adverse effects thereof, including, but not limited to, blasting influences. Any damages caused by blasting shall be repaired by the Contractor at his own expense.

PART 2 PRODUCTS

2.1 BACKFILL MATERIALS

A. Native backfill and select granular backfill, where required, shall be as specified in Section 31 05 13.

## 2.2 BEDDING AND COVER MATERIALS

A. Pipe bedding and cover materials shall be as specified in Section 31 05 13.

# PART 3 EXECUTION

## 3.1 LINES AND GRADES

A. Lay pipes to lines and grades indicated on Drawings.
   1. Engineer reserves right to make changes in lines, grades, and depths of utilities when changes are required for Project conditions.

B. Use laser-beam instrument with qualified operator to establish lines and grades.

## 3.2 PREPARATION

A. Call Diggers Hotline Information service at 1-800-242-8511 not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

B. Identify required lines, levels, contours, and datum locations.

C. Protect plant life, lawns, and other features remaining as portion of final landscaping.

D. Protect bench marks, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

E. Maintain and protect above and below grade utilities indicated to remain.

F. Establish temporary traffic control and detours when trenching is performed in public right-of-way. Relocate controls and reroute traffic as required during progress of Work.

## 3.3 TRENCHING

A. Perform trenching as specified in 29 CFR part 1926, OSHA subpart P for excavations and trenches.

B. Remove lumped subsoil, boulders, and rock up of 1/6 cubic yard, measured by volume.

C. Perform excavation within 24 inches of existing utility service in accordance with utility's requirements.

D. Except by permission of the Engineer, not more than 250 feet of trench shall be opened at any one time. Not more than 200 feet of trench may be opened in advance of the completed pipe laying operations; and not more than one street crossing may be obstructed by the same trench at any one time.

E. Cut trenches to width indicated on Drawings. Sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Work.

F. Excavate bottom of trenches wide enough to provide free working space on each side of the pipe, preferably this space shall not exceed ½ the nominal diameter of the pipe of the size of the sewer, and never be less than 6 inches. The working space required shall depend upon the size of the pipe and the character of the material encountered in the excavation. The trench shall always provide sufficient space between the pipe and sides of the trench to allow for preparing the foundation, laying the sewer, and placing and compacting the backfill as specified.

G. Excavate trenches to depth indicated on Drawings. Provide uniform and continuous bearing and support for bedding material and pipe.

H. Do not interfere with 45 degree bearing splay of foundations.

I. When Project conditions permit, slope side walls of excavation starting 2 feet above top of pipe. If utilities and other restraints make sloping or benching of the excavation impractical, employ a shoring system conforming to OSHA Subpart P.

J. When subsurface materials at bottom of trench are loose or soft, excavate to greater depth as directed by notify Engineer, and request instructions.

K. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Base Aggregate Dense 3" per Section 32 11 23 and compact to density equal to or greater than requirements for subsequent backfill material.

L. Trim excavation. Hand trim for bell and spigot pipe joints. Remove loose matter.

M. Correct areas over excavated areas with compacted backfill as specified for authorized excavation or replace with fill concrete as directed by Engineer.

N. Remove surplus excavated material not intended for reuse, from site.

3.4 EXCAVATED MATERIAL

A. The excavated material to be used for trench backfilling must be stored so that it will cause a minimum of inconvenience to public travel, adjacent owners or tenants and other contractors or subcontractors.

B. The excavated material, which is not to be used for trench backfilling, shall be removed immediately from the site.

C. No claim for extra payment will be allowed because of the presence of quicksand or other materials tending to increase the excavating costs, unless specifically provided for in the Contract Documents, or as approved by the Engineer.

3.5 SURPLUS EXCAVATED MATERIAL

A. Surplus excavated material shall be disposed of by the Contractor at his own option and cost unless he is otherwise directed by the Contract Documents, with the exception in both cases as specified in the following paragraph.

B. The Engineer reserves the right to order up to 10% of the surplus excavated material to be delivered to streets, alleys, public properties, or other locations designated by the Engineer. The cost of delivering such surplus material to any point within a driving distance of two miles from the site of the work shall be included in the unit price bid for the work.

C. After delivery to any designated location, such material shall be leveled off by the Contractor.

3.6 EXCAVATION IN ROCK

A. When rock is encountered, it shall be stripped of earth and shale and the Engineer notified in order that he may measure or cross-section the same. In lieu of stripping the earth overburden prior to blasting, the Engineer and the Contractor may mutually agree on a method to define the vertical limits of the rock. Any rock excavated, before such measurement or agreement is made, will not be estimated, or paid for. Rock excavation shall be defined to include all hard solid rock in natural conglomerate deposits so firmly cemented as to present all the characteristics of solid rock, and masonry or concrete structures not shown on plans. Shales, hard pan, masonry and concrete rubble, boulders less than one (1) cubic yard which are not a part of or attached to sub-strata of rock, will not be considered rock excavation.

B. The classification of rock excavation does not apply to crushed aggregate or asphaltic bas or surface courses, or to Portland cement base or surface courses.

C. The trench in rock excavation shall be excavated to a point six (6) inches below the bell of a bell and spigot type pipe and six (6) inches below the outside of the barrel of a tongue and groove type pipe.

D. The pay width for rock excavation in open cut shall be the actual width of the excavated trench, but not to exceed the outside diameter of the pipe plus twenty-four (24) inches.

E. Existing utilities damaged during rock excavation or blasting will be replaced at the Contractor's expense.

F. If excavation methods leave undrained pockets in the rock surface, drain the depressions properly. If the engineer allows, the contractor may fill the depressions with engineer-approved impermeable material, at no expense to the Owner.

3.7 PIPE BEDDING

A. Bedding and cover material for utilities shall conform to Section 31 05 13. The standard trench section shall be as specified below.

B. Sanitary Sewer
   1. Class C (ASTM C12) shall be used for all gravity sanitary and storm sewers, PVC water main, and PVC force main: The pipe shall be bedded in compacted Class I material placed on a flat trench bottom. The bedding shall have a minimum thickness of 6-inches under the barrel and shall extend one-tenth to one-sixth of the outside diameter up the pipe barrel at the sides. The remainder of the side fills and to minimum depth of 6-inches over the top of the pipe shall be filled with lightly compacted cover material. The cover material shall be Class I.
   2. Class I material shall be as specified in Section 31 05 13.

C. Storm Sewer
   1. Class B (ASTM C12) shall be used for all gravity storm sewers: The pipe shall be bedded in compacted Class I material placed on a flat trench bottom. The bedding shall have a minimum thickness of 6 inches under the barrel and shall extend to the spring line of the pipe. The remainder of the side fills and to minimum depth of 12-inches over the top of the pipe shall be filled with lightly compacted cover material. The cover material shall be Select Granular Backfill per Section 31 05 13.

D. Water Main
   1. Type 3 Embedment according to AWWA C600 shall be used for ductile iron pipe: Pipe shall be bedded on 6-inches minimum of loose soil with backfill lightly consolidated to 12-inches above the top of pipe. Loose material shall be select granular backfill or screenings, free of rocks, foreign materials, and frozen earth.
   2. Class C (ASTM C12) shall be used PVC water main: The pipe shall be bedded in compacted Class I, II, or III material placed on a flat trench bottom. The bedding shall have a minimum thickness of 6 inches under the barrel and shall extend one-tenth to one-sixth of the outside diameter up the pipe barrel at the sides. The remainder of the side fills and to minimum depth of 6-inches over the top of the pipe shall be filled with lightly compacted cover material. The cover material shall be Class I, II, or III.

E. Unstable Foundation: If the bottom of the trench is of undesirable material, such as organic soil, or the presence of ground water causes a condition that cannot adequately support the main, the unsuitable material shall be removed and replaced with Class I material. Depth greater than 3" will be considered extra work.

## 3.8 SHEETING AND SHORING

A. Open-cut trenches shall be sheathed and braced as required by applicable Federal and State Codes, by the Contract Documents, and as may be necessary to protect life, property, or the work. When close sheathing is required, it shall be driven so as to prevent soil from entering the trench either below or through such sheathing.

B. For any trench section, the Engineer may allow close sheathing to be set in place rather than be driven, providing that ground conditions are suitable and that the trench is properly spot braced prior to the placing of sheathing. Any voids behind the sheathing shall be immediately filled with backfill gravel.

C. Lower Limits of Sheathing:

1. The Engineer reserves the right to order the sheathing driven to such additional depths below the pipe as may be required for the protection of the work.
2. Where the sheathing must be driven below the top of a concrete cradle or envelope, tarpaper or other suitable material shall be used to break the bond between the concrete and the sheathing so as to permit the removal of the sheathing.

D. Design sheeting and shoring to be removed at completion of excavation work.

E. Removal of Sheathing and Bracing:
1. Trench sheathing and bracing, including sections, which have been ordered left in place, shall be removed for a distance of three (3) feet below the established street grade or the existing surface grade, whichever is lower.
2. Trench sheathing and bracing shall be removed before the trenches are flooded, but only when and in such manner as will insure adequate protection of the completed sewer or water structures and adjacent underground or surface structures, and prevent the disturbance of adjacent ground. Trench bracing, except that which must be left in place, may be removed when the backfilling has reached the respective levels of such bracing. Sheathing, except that which must be left in place, shall be removed after the backfilling has been completed or has been brought up to such elevation as to permit its safe removal.

F. Repair damage caused by failure of the sheeting, shoring, or bracing and for settlement of filled excavations or adjacent soil.

G. Repair damage to new and existing Work from settlement, water or earth pressure or other causes resulting from inadequate sheeting, shoring, or bracing.

H. Cost of Sheathing and Bracing:
1. The cost of furnishing, placing and removing of sheathing and bracing in open-cut trench, and the leaving in place of sheathing and bracing specifically indicated on the plan or in the Contract Documents, shall be included in the unit price bid for the work.
2. Sheathing and bracing shall include all stringers, wales, and cross braces deemed necessary by the Engineer to protect the work.
3. The cost of furnishing and placing shoring and bracing in tunnel construction shall be included in the unit price bid for such work in tunnel.

I. The right of the Engineer to order sheathing and bracing left in place shall not be construed as creating any obligation on his part to issue such orders. His failure to exercise his right to do so shall not relieve the Contractor of any liability for damages to persons or property occurring from or upon the work of constructing the sewer, water main, or appurtenances occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place in the trench sufficient sheathing and bracing to prevent the caving or moving of the ground, or disturbance of the completed work or any of the surface or subsurface structures.

J. Portable Trench Box or Sliding Trench Shield
1. Portable trench boxes or sliding trench shields complying with OSHA regulations may be used. Use of the shield shall not relieve the Contractor of any liability for damages

to persons or property occurring from or upon the work of constructing the sewer, water main, or appurtenances occasioned by negligence or otherwise, growing out of a failure on the part of the Contractor to leave in place in the trench sufficient sheathing and bracing to prevent the caving or moving of the ground, or disturbance of the completed work or any of the surface or subsurface structures.

2. Care shall be taken when a trench box or shield is moved ahead so as not to pull the already jointed pipe apart, leave voids around the pipe wall or change the alignment.
3. Where a concrete cradle or envelope is required, tarpaper or other suitable material shall be used to prevent a bond between the spacer and the concrete, so as to permit moving of the shield without disturbing the pipe, cradle, or envelope. A suitable spacer between the concrete and the shield shall be provided.
4. The width of the trench shield or box shall be such that a minimum six (6) inch horizontal clearance is maintained between the pipe and shield at all times.
5. Any voids between the trench box or shield and the undisturbed trench wall within the pipe zone (bottom of trench to top of cover material) shall be filled with crushed stone chips or backfill gravel, immediately after the box or shield is positioned.

## 3.9 SUPPORT OF UNDERGROUND STRUCTURES

A. Concrete backfill shall be used to support sewers, building sewers, water mains, and other utilities crossing trenches. With prior written approval of the Engineer, the Contractor may substitute reinforced concrete beams.

## 3.10 BACKFILLING

A. NATIVE BACKFILL
   1. Unless otherwise specified, material excavated from an open trench may be used for backfilling if it meets the requirements of Section 31 05 13 and is approved by the Engineer. Where excavated material is used for backfilling and there is a deficiency due to the rejection of a part thereof, the Contractor, upon the written order of the Engineer, shall furnish an additional quantity of select granular backfill.
   2. Vegetable or other organic matter, all types of refuse, large pieces, or fragments of concrete and frozen materials are unsuitable for backfilling.
   3. Native backfill material shall be used in streets only where soil is of proper moisture content so that the required compaction can be achieved. Where compaction requirements cannot be achieved, granular backfill shall be used.

B. SELECT GRANULAR BACKFILL
   1. Trenches shall be filled with select granular backfill where specifically called for on the plans or if directed by the Engineer when native backfill does not conform to Section 31 05 13.

C. All pipe or manholes with a rubber gasket or resilient type joint shall be backfilled within 24 hours after installation. Pipe sewers or manholes with cement mortar joints shall not be backfilled until initial set has occurred.

D. Large stones or hard or frozen lumps of earth will not be allowed in the backfill. Material, which has frozen in the stockpile, shall be replaced with acceptable backfill by the Contractor at his own expense.

E. After the cover material has been placed, the backfill shall be deposited and consolidated in accordance with this Section. The Contractor will be held responsible for any damage to underground structures.

F. Unless otherwise specified, native material excavated from an open trench may be used for backfilling if approved by the Engineer. Where excavated material is used for backfilling and there is a deficiency due to the rejection of a part thereof, the Contractor, upon the written order of the Engineer, shall furnish an additional quantity of granular backfill.

G. In existing pavement and roadways, the trench shall be backfilled to the existing surface, subject to surfacing requirements as indicated on the plans. In streets under construction, in open areas and in easements, the trench shall be backfilled to the existing ground surface or to the proposed or established grade, whichever is lower, unless otherwise specified.

H. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

I. Place and compact backfill material above the pipe in layer no more than 12 inches deep, to the top of the trench. Compact to the same degree as the material next to the trench.

J. Do not walk or work on the completed pipe, except as necessary to tamp or backfill, until backfilling the trench to at least 2 feet above the top of pipe.

K. Employ placement method that does not disturb or damage utilities in trench, and existing facilities to remain. Tamp or ram each layer thoroughly with proper tools that do not injure or disturb the pipe.

L. Maintain optimum moisture content of fill materials to attain required compaction density.

M. Do not leave more than 25 feet of trench open at end of working day.

N. No sewer or water main shall be backfilled in absence of the engineer's construction representative without the opportunity to observe the installation. In case the Contractor fails to observe this requirement, he shall uncover the pipe where requested and backfill the trench at his own expense.

O. Contractor shall provide temporary drainage and efficient management of surface water runoff to reduce the flow of storm water runoff into site excavations and construction areas.

P. Protect open trench to prevent danger to Owner and the public.

3.11 CONSOLIDATION OF BACKFILL

A. All backfill material shall be consolidated. Fill material shall be placed in lifts such that the required density is achieved throughout the entire lift with the equipment used by the

contractor. The contractor shall place smaller lifts if the required compaction cannot be obtained. Fill material beneath paved areas and within five (5) feet of paved areas shall be consolidated as follows; within three (3) feet of the surface 95% of maximum dry density, below three (3) feet from the surface to one (1) foot above the pipe 90% of maximum dry density, backfill material beneath non-paved areas shall be consolidated to a compaction density of a minimum of 90% of maximum dry density, as determined by the Modified Proctor Test (ASTM D1557).

B. Mechanical Compaction of Earth or Gravel. Unless otherwise directed by the Engineer, mechanical compaction of backfill material shall be used to achieve the results required. All initial required compaction testing will be performed by the Engineer at no cost to the Contractor. The cost of required re-tests due to test failures shall be paid by the Contractor. The Contractor shall fully cooperate and provide whatever assistance, time and safe access is necessary for the performance of the tests. The trench shall be kept free of visible water during the backfilling and compaction work. The cover material shall be placed over the pipe and care shall be taken not to exert undue stress on the pipe during the compaction operation. The thickness of compacted lifts shall be such that allows the density throughout the entire thickness of the lift to meet the density requirements, with the compaction equipment used by the Contractor. The Contractor shall use smaller lifts if the required compaction cannot be obtained.

C. Jetting/Flooding of Granular Soils or Gravel. Jetting or flooding of granular soils or gravel for backfill consolidation will only be allowed if approved by the Engineer. Granular soils or gravel backfill shall be settled by jetting or flooding the trench with water after backfill has been placed. Compaction results obtained by jetting or flooding shall conform to this Section. The Contractor shall provide an adequate supply of water.

D. Contractor shall compact under and along the side of the pipe with a jumping jack or plate compactor.

E. Special compaction methods around manholes and other appurtenances shall be used to insure proper compaction.

F. Any backfill found to be deficient in meeting the mechanical compaction specification shall be re-excavated and re-consolidated at the Contractor's expense. The costs of retesting backfill consolidation found to be deficient shall be paid by the Contractor.

3.12 INTERFERENCE OF UNDERGROUND STRUCTURES

A. When an underground structure interferes with the work to such an extent that an alteration of the plan is required, such alteration shall not be made without the prior approval of the ENGINEER. If the alteration results in a change in the cost to the CONTRACTOR, the ENGINEER will issue a change order for such altered work.

B. No pipe, conduit, or other underground structure shall be allowed to remain in, penetrate, reduce the cross-sectional area, or abridge the use of any sewer or appurtenance to be constructed under the contract.

C. Where a previously unknown underground structure is encountered in the trench or tunnel of the proposed sewer, and because of interference, such part of the structure

requires relocation, or chipping away of a part of the structure, the CONTRACTOR shall immediately notify the ENGINEER.

D. Where the line and/or grade of the proposed sewer conflicts with an existing water main, the OWNER will arrange to relocate the water main at no cost to the CONTRACTOR or negotiate with the CONTRACTOR to perform such required relocation as an extra, unless otherwise specified. The CONTRACTOR shall in either case excavate the area around the water main to allow sufficient room to relocate the main.

E. No extra compensation will be paid for unavoidable delays caused by the interference of existing underground structures.

F. In the event that the above-mentioned relocation is to be made for the convenience of the CONTRACTOR, the CONTRACTOR shall first notify the ENGINEER and the structure owner of his desire to relocate such structure or to discontinue the service; and receive from the structure owner permission for relocation or discontinuance of service. Replacement to original position and condition shall be made at no cost to the OWNER.

G. All sewer, building sewers or drains under proposed installation shall, when deemed necessary by the ENGINEER, be enveloped, capped, or bridged with concrete. Such work is considered incidental to the proposed installation.

3.13 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Top Surface of Backfilling Under Paved Areas : Plus or minus 1 inch from required elevations.

C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.14 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform laboratory material tests in accordance with ASTM D1557. ASTM D698. AASHTO T180.

C. Perform in place compaction tests in accordance with the following:
   1. Density Tests: ASTM D1556, ASTM D2167, or ASTM D2922.
   2. Moisture Tests: ASTM D3017.

D. When tests indicate Work does not meet specified requirements, remove Work, replace, compact, and retest.

E. Frequency of Tests: One (1) test per two (2) lift per 200 feet of trench if required by Engineer.

3.15 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished work.

B. Reshape and re-compact fills subjected to vehicular traffic during construction.

END OF SECTION

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SECTION 31 25 13

EROSION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Sediment and Erosion Control
2. Site Stabilization
3. Silt Fence
4. Inlet Protection
5. Tracking Pad
6. Erosion Mat
7. Ditch Check
8. Gabions
9. Sediment Basin
10. Sediment Trap
11. Dust Control
12. Soil Stabilizer
13. Rip Rap

B. Related Sections:
1. Section 31 05 13 - Soils for Earthwork.
2. Section 31 10 00 - Site Clearing.
3. Section 31 23 16 - Earthwork.
4. Section 32 91 19 - Landscape Grading.
5. Section 32 92 19 - Seeding.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Silt Fence:
1. Basis of Measurement: By lineal foot.
2. Basis of Payment: Includes furnishing materials, tools, equipment and incidentals to install, maintain and remove following revegetation as required.

B. Inlet Protection:
1. Basis of Measurement: By each.
2. Basis of Payment: Includes furnishing materials, labor, tools, equipment, maintaining, cleaning and incidentals required to complete the work and removal of protection following revegetation.

C. Tracking Pad:
1. Basis of Measurement: By the ton.
2. Basis of Payment: Includes furnishing materials, labor, tools, equipment and incidentals to complete the work. Load tickets will be collected and used to determine quantity.

D. Erosion Mat:
   1. Basis of Measurement: By square yard.
   2. Basis of Payment: Includes furnishing materials, labor, tools, equipment and incidentals to complete the work. Seeding and fertilization prior to placement of mat shall be paid for under the restoration item.

E. Ditch Check:
   1. Basis of Measurement: By the ton for stone. Load tickets will be collected and used to determine quantity. By each for straw or other engineered material as called out on the plan or bid items.
   2. Basis of Payment: Includes furnishing materials, including stakes; for anchoring the ditch checks; for all excavation, including trenches and sumps; for removal and disposition of the bales and all waste or surplus materials, including eroded materials; for shaping and restoring ditches; and for furnishing all labor, tools, equipment and incidentals necessary to complete the work. Any required topsoiling, fertilizing, or seeding will be measured and paid for under the applicable item.

F. Gabions:
   1. Basis of Measurement: By lineal foot according to the detail included in the plans.
   2. Basis of Payment: Includes furnishing materials and installing the gabion walls, clear stone, fabric and all labor, tools, equipment and incidentals necessary to complete the work. Any required topsoiling, fertilizing, or seeding will be measured and paid for under the applicable item.

G. Sediment Basin:
   1. Basis of Measurement: By lump sum unless otherwise indicated on the bid form.
   2. Basis of Payment: Includes clearing, excavating, constructing embankment and trench and rock basin and all labor, tools, equipment and incidentals necessary to complete the work. Piping and seeding will be measured and paid for under the applicable bid item.

H. Sediment Trap:
   1. Basis of Measurement: By lump sum unless otherwise indicated on the bid form.
   2. Basis of Payment: Includes clearing, excavating, constructing embankment and trench and rock basin and all labor, tools, equipment and incidentals necessary to complete the work. Piping and seeding will be measured and paid for under the applicable bid item.

I. Dust Control:
   1. Basis of Measurement: By lump sum unless otherwise indicated on the bid form. When no quantity is provided, dust control shall be considered incidental to construction.
   2. Basis of Payment: Includes full compensation for controlling dust throughout the course of construction, including furnishing, handling, storing, transporting and applying the material (including water) and completing the work.

J. Soil Stabilizer:
   1. Basis of Measurement: By each unless otherwise indicated on the bid form.
   2. Basis of Payment: Includes furnishing materials, labor, tools, equipment and incidentals to complete the work.

K. Except for items listed in the Bid Form, erosion and sediment control measures will be considered incidental to the construction.

L. Rip Rap:
   1. Basis of Measurement: By the ton.
   2. Basis of Payment: Includes furnishing materials, labor, tools, equipment and incidentals to complete the work. Load tickets will be collected and used to determine quantity.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T88 - Standard Specification for Particle Size Analysis of Soils.
   2. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete.

C. ASTM International:
   1. ASTM C127 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate.
   2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   4. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

D. Precast/Prestressed Concrete Institute:
   1. PCI MNL-116S - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on geotextile.

C. Submit proposed mix design of each class of concrete for review prior to commencement of Work.

D. Test Reports: Indicate certified tests results for precast concrete at manufacturing facility, cast-in-place concrete in field, and granular backfill.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements for all materials.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with State of Wisconsin Department of Natural Resources Best Management Practices.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.8 ENVIRONMENTAL AND EROSION CONTROL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. At a minimum, the following erosion and sediment control measures shall be implemented at all construction sites.
   1. Sediment from overland flow shall be prevented from leaving the work site by installing straw bales or silt fencing, parallel to the contours, downhill from the work area.
   2. During pipeline construction, excavated material shall be placed on the high side of the trench. All trench water shall be discharged into a settling basin or through a filtering device prior to release into a storm sewer or stream. At the end of each day the trench shall be backfilled, compacted, and stabilized.
   3. Storm sewer inlets shall be protected from runoff by encircling with straw bales or silt fencing.
   4. Stone tracking pads shall be installed at all construction site exits to prevent soil tracking. Tracked soil shall be collected from paved roads located near construction sites on a daily basis.
   5. Minimize surface area of bare soil exposed at one time.
   6. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow.
   7. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

PART 2 PRODUCTS

2.1 GEOTEXTILE MATERIALS

A. Furnish materials in accordance with State of Wisconsin Department of Transportation standards.

B. Geotextile Fabric: Furnish in accordance with State of Wisconsin Department of Natural Resources Best Management Practices.

2.2 EROSON MAT

A. Erosion mat shall be listed on the Wisconsin DOT Product Acceptability List (PAL) and be a 100% biodegradable blanket of the class and type indicated on the plans or bid form. Curlex Netfree by American Excelsior or equal.

B. Staples for anchoring the erosion mat in place shall be U-shaped, biodegradable landscape stakes. Staples to be e-staple by American Excelsior or equal.

2.3 SILT FENCE

A. Geotextile Fabric.

1. The Geotextile fabric shall consist of either woven or nonwoven polyester, polypropylene, stabilized nylon, polyethylene, or polyvinylidene chloride. Nonwoven fabric may be needle punched, heat bonded, resin bonded, or combination thereof. Submit a certificate of compliance certifying that geotextile conforms to the following:

| **TEST** | **METHOD** | **VALUE MINIMUM REQUIREMENTS** |
|---|---|---|
| Minimum Grab Tensile Strength (cross machine direction) (lb) | ASTM D-4632 | 100 |
| Minimum Grab Tensile Strength (machine direction) (lb) | ASTM D-4632 | 120 |
| Maximum Apparent Opening Size (equivalent standard sieve) | ASTM D-4751 | No. 30 |
| Minimum Permitivity | ASTM D-4491 | 0.05 $S^{-1}$ |
| Minimum Ultraviolet Stability (strength retained at 500 hours of exposure) | ASTM D-4355 | 70% |

2. The geotextile fabric shall be insect, rodent, mildew and rot resistant.

B. Fence Support System

1. The fence support system shall comply with plan requirements.

2.4 INLET PROTECTION

A. All fabrics used as part of an inlet protection device must be selected from the list of approved fabrics certified for inlet protection, Geotextile Fabric, Type FF in the current addition of the WisDOT Product Acceptability List (PAL).

2.5 TRACKING PADS

A. The aggregate for tracking pads shall be 3 to 6 inch clear or washed stone or as directed by the Engineer. All material to be retained on a 3-inch sieve.

2.6 DITCH CHECK

A. Ditch checks shall be constructed out of the material as called out on the plans or bid items. All ditch checks must be constructed out of stone, straw bales, or other engineered products found on the Wisconsin Department of Transportation Erosion Control Product Acceptability List (PAL).
   1. Stone ditch checks shall be constructed of a well-graded angular stone, a $D_{50}$ of 3 inch or greater, sometimes referred to as breaker run or shot rock.
   2. Straw Bales shall be straw, hay, or other approved material, in good condition, of the size shown on the plans. Stakes shall be wood or metal of the size shown on the plans.
   3. Straw Wattle Ditch Checks shall be AEC Premier Straw Wattles or approved equal. Straw Wattles shall be 12 inches in diameter by 10 feet long.

2.7 GABIONS

A. Gabions shall be constructed and filled with stone as specified on the plan details.

B. Gabion baskets shall consist of PVC coated wire and shall be 3-feet wide by 3-feet tall and to the lengths and heights as shown on the plans or as directed by the Engineer.

C. Fabric placed around the gabion shall be DOT Type DF.

2.8 SEDIMENT BASIN

A. Material shall be as called out on the plan details.

2.9 SEDIMENT TRAP

A. Material shall be as called out on the plan details.

2.10 DUST CONTROL

A. Material shall be as called out on the plan details or bid items.

B. Material applied shall conform to the requirements of Section 623 of the Wisconsin Department of Transportation Standard Specifications and the Wisconsin DNR Conservation Practice Standard 1068.

2.11 SOIL STABILIZER

A. Soil stabilizer shall consist of WisDOT Type B stabilizer from the PAL unless otherwise indicated on the bid form. Soil stabilizer shall conform to the Wisconsin DNR Conservation Practice Standard 1050.

2.12 Rip Rap

A. Furnish materials in accordance with Section 606 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify compacted subgrade is acceptable and ready to support devices and imposed loads.

C. Verify gradients and elevations of base or foundation for other work are correct.

3.2 EROSION CONTROL REQUIREMENTS

A. Erosion control is the responsibility of the Contractor until acceptance of the project.

B. The erosion control measures and structures shown on the plans and described in the specifications shall be considered the minimum erosion control requirements. These measures shall be installed prior to start of construction and must be maintained and adjusted as necessary throughout construction.

C. The Contractor shall be responsible for checking erosion control measures at the end of each week and after a rain event of 0.5" or more throughout the length of construction. Contractor shall complete and maintain a copy of the WDNR erosion control inspection form for each inspection. Contractor shall also provide a copy to Engineer.

D. Contractor is responsible for implementation and maintenance of erosion control measures until the disturbed area is stabilized. All erosion control measures shall be in working condition at the end of each working day. The site will be considered stable when no soil leaves the site as a result of storm events and the areas served have established permanent vegetative cover. Adjustments shall be made to the erosion control measures as required.

E. Maintaining a clean job site including sweeping dust and sediment off from the adjacent streets shall be the responsibility of the contractor and shall be incidental to all other construction.

3.3 SITE STABILIZATION

A. Incorporate erosion control devices indicated on the Drawings into the Project at the earliest practicable time.

B. Construct, stabilize and activate erosion controls before site disturbance within tributary areas of those controls.

C. Clear only those areas designated for the placement of improvements or earthwork before placement of the final cover. Perform stripping of vegetation, grading, excavation, or other land disturbing activities in a logical sequence and manner that will minimize erosion. If possible, schedule construction for times of the year when erosion hazards are minimal.

D. Stockpile and waste pile heights shall not exceed 35 feet. Slope stockpile sides at 2: 1 or flatter.

E. Stabilize any disturbed area of affected erosion control devices on which activity has ceased and which will remain exposed for more than 14 days.
   1. During non-germinating periods, apply mulch at recommended rates.
   2. Stabilize disturbed areas which are not at finished grade and which will be disturbed within one year in accordance with Section 32 92 19 at percent of permanent application rate with no topsoil.
   3. Stabilize disturbed areas which are either at finished grade or will not be disturbed within one year in accordance with Section 32 92 19 permanent seeding specifications.

F. Stabilize diversion channels, sediment traps, and stockpiles immediately.

G. Do not locate any soil or dirt piles which will remain in existence for more than 7 consecutive days, whether to be worked during that period or not, within 25 feet of any roadway, parking lot, paved area, or drainage structure or channel (unless intended to be used as part of the erosion control measures.)

H. Do not discharge water in a manner that will cause erosion or sedimentation of the site or receiving facility.

3.4 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

3.5 EROSION MAT

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1052 for Non-Channel Erosion Mat products and Wisconsin DNR Conservation Practice Standard 1053 for Channel Erosion Mat products.

B. In all cases, lining installation and anchoring must be performed in strict compliance with the manufacturer's recommendations and guidelines.

C. The erosion mat shall be placed on a specified area immediately after the seeding or

sodding operations have been completed. All stones or clods over 1-1/2 inches in diameter and all roots, sticks or other foreign material, which would interfere with the mat bearing completely on the soil or sod, shall be removed prior to placing the mat.

D. Any small stones or clods, which prevent contact of the mats with the soil, shall be pressed in the soil with a small lawn-type roller or by other effective means. The mat shall have its lateral edges so impressed in the soil as to permit runoff water to flow over it.

E. In the event methods and details for placing erosion mat are incorporated in the plans, the work shall conform thereto.

F. Any seeded areas damaged or destroyed during erosion mat placing operations shall be reseeded as specified for the original seeding. All surplus excavation or materials, and all stones, clods or other foreign material removed in the preparation of the seeded soil or sodded surface for placing the mat, shall be disposed of by the contractor.

G. Following the placing of the mat, water shall be uniformly applied to the area sufficiently to moisten the seedbed to a depth of two inches and in a manner to preclude washing or erosion.

H. The contractor shall maintain the erosion mat and make satisfactory repairs of any areas damaged by erosion, traffic, fires, or other causes until acceptance of the work.

I. The matting strips shall be rolled on or laid in the direction of the flow. The mat shall be spread evenly, smoothly, in a natural position without stretching and with all parts bearing on the soil. Wood fiber blanket shall be placed with the netting on top. Adjacent strips shall overlap at least four inches. Strip ends shall overlap at least ten inches. All overlaps shall be made with the upgrade section on top.

J. The upgrade end of each strip shall be buried at least six inches in a vertical slot cut in the soil and the soil pressed firmly against the embedded blanket.

K. The mat shall be anchored in place with vertically driven staples, driven until their tops are flush with the soil. Staples shall be spaced at three-foot centers along mat edges and be alternately spaced at three-foot centers through the center. Staples shall be at ten-inch centers at end or junction slots.

L. Erosion mats shall at a minimum be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

3.6 SILT FENCE

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1056.

B. Installation and Removal

The silt fence shall be erected prior to starting any construction operation, which might cause any sedimentation or siltation at the site of the proposed silt fence.

The silt fence shall, when possible, be constructed in an arc or horseshoe shape with its ends pointing up slope. The silt fence shall be constructed to the dimensions and in accordance with the details shown on the plans. Silt fences shall be removed, as determined by the engineer, after the slopes and ditches have been stabilized and turf developed to the extent that future erosion is unlikely. Materials remaining after removal shall become the property of and shall be disposed of by the contractor.

C. Inspection and Maintenance

The contractor shall inspect all silt fences weekly and immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the contractor. In addition, the contractor shall make a daily review of the location for silt fences and filter barriers in areas where construction activity changes the earth contour and drainage runoff to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or directed by the engineer.

Sediment deposits shall be removed when the deposit reaches approximately one-half of the volume capacity of the silt fence as determined by the engineer and disposed of as directed by the engineer. Any sediment deposits remaining in place after the silt fence is no longer required shall be dressed to conform with the existing grade and the area topsoiled, fertilized, and seeded as required.

3.7 INLET PROTECTION

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1060.

B. Inlet protection shall be Type D (Catch-All) unless otherwise called out on the plans or bid form.

C. Inlet protection shall be provided at all existing inlets prior to construction and proposed inlets following inlet construction. Inlet protection shall be installed in such a manner as to prevent sediment from entering the inlet.

D. Inlet protection shall be inspected by the Contractor following rain events of 0.5" or greater and at least once per week. Deposited sediment shall be removed and properly disposed of.

E. The contributing drainage area to the inlet protection device shall be one acre or less. In instances where a larger contributing drainage area exists, runoff shall be routed through a properly designed sediment trapping or settling device upstream of inlet.

F. Filter Fabric Barrier Criteria (See Detail):
   1. Inlet protection Type A devices shall be utilized around inlets and unpaved areas until permanent stabilization methods have been established. Type A devices shall be utilized on inlets prior to installation of curb and gutter or pavement, and where safety considerations are not compromised on the site.
   2. Inlet protection Type B shall be utilized after the casting and grate are in place.
   3. Inlet protection Type D shall be utilized in areas where other types of inlet protection are identified as incompatible with roadway and traffic conditions, causing possible

safety hazards when ponding occurs at the inlet. Type D shall only be used after casings are in place on top of the inlet boxes.

4. Type D inlet protection shall conform to the details as shown in the plans. There shall be a three-inch space between the bag and the sides of the inlet to prevent the inlet sides from blocking the overflow; and shall only be used in inlets deeper than 30 inches from the top grate to the bottom of the inlet. If such clearance is not available, cinch or tie the sides of the bag (with rope or ties) to provide clearance.

G. Criteria Applicable to the Post-Paving/Curbing Phase of Construction
   1. Inlet protection Types B, C and D are applicable to post paving construction (see detail).
      a. Type B shall be utilized on inlets without curb box.
      b. Type C shall be utilized on street inlets with curb heads. A 1 ½" x 3 ½" minimum, piece of wood shall be wrapped and secured in the fabric and placed in front of the curb head as shown on the plans. The wood shall not block the entire opening of the curb box and be secured to the grate with wire or plastic ties.
      c. Type D.

H. Remove inlet protection devices once contributing drainage area is stabilized with appropriate vegetation or impervious area.

3.8 TRACKING PAD

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1057.

B. Clear stone tracking pads shall be constructed at each construction site entrance prior to any traffic leaving the site.

C. Tracking pads shall be 50"L x 25'Wx1'D, unless otherwise specified.

D. On sites with a high water table, or where saturated conditions are expected during the life of the practice, stone tracking pads shall be underlain with a WisDOT Type R geotextile fabric to prevent migration of underlying soil into the stone.

E. Tracking pads shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

F. The tracking pad performance shall be maintained by scraping or top-dressing with additional aggregate.

G. Tracking pad stone or crushed aggregate base course shall be used to cover utility trenches to prevent erosion on an as needed basis.

3.9 DITCH CHECK

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1062.

B. The ditch checks are to be constructed to the dimensions, material and locations as indicated on the plans.

C. Ditch checks must be installed with the center lower than the sides forming a weir.

D. The contractor shall be responsible for installing the ditch checks and ensuring that the site is not susceptible to erosion at the end of each work day.

E. Ditch checks shall be in place during rough grading and be removed once the site has been stabilized as directed by the Engineer, unless intended to be part of a permanent stormwater management plan.

F. Ditch checks shall be inspected by the Contractor following rain events of 0.5" or greater and at least once per week. Sediment deposits shall be removed when deposits reach 0.5 the height of the barrier. Removal of sediment may require replacement of stone. Maintenance shall be completed as soon as possible with consideration to site conditions.

3.10 GABIONS

A. Gabions shall be installed as shown in the plan details and in accordance with the manufacturer's recommendations.

B. Fabric shall be placed under, around, and between all soil/gabion interfaces.

3.11 SEDIMENT BASIN

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1064.

B. Clear and grub storage area and embankment foundation area site as specified in Section 31 10 00.

C. Do not use coarse aggregate as backfill material around pipe. Backfill pipe with suitable embankment material to prevent dam leakage along pipe.

D. Construct rock basin at outlet end of pipe, as specified in this Section. Place embankment material, as specified in Section 31 23 23. When required, obtain borrow excavation for formation of embankment, as specified in Section 31 23 23.

E. On entire sedimentation basin area, apply soil supplements and sow seed as specified in Section 32 92 19.

F. Mulch seeded areas with hay as specified in Section 32 92 19.

3.12 SEDIMENT TRAP

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1063.

B. Clear site, as specified in Section 31 10 00.

C. Construct trap by excavating and forming embankments as specified in Section 31 23 16 and Section 31 05 13.

D. Place coarse aggregate or rock at outlet as indicated on Drawings.

E. Place geotextile fabric, as specified for rock energy dissipater.

F. When required, obtain borrow excavation for formation of embankment, as specified in Section 31 23 16.

G. On entire sediment trap area, apply soil supplements and sow seed as specified in Section 32 92 19.

H. Mulch seeded areas with hay as specified in Section 32 92 19.

3.13 DUST CONTROL

A. Execute Work by methods to minimize the dispersion of dust during the course of construction by application of water or other methods as approved by the Engineer to all areas within the project creating dust dispersion from the Contractor's operations, and from regular vehicle traffic.

B. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1068.

C. The application rate shall be per the manufacturer's recommendations.

D. Dust control methods shall be applied whenever dust dispersion becomes a nuisance, or as directed by the Engineer.

3.14 SOIL STABILIZER

A. Perform work in accordance with Wisconsin DNR Conservation Practice Standard 1050.

B. The application rate shall be per the manufacturer's recommendations.

C. Apply as directed by the Engineer.

3.15 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

B. When required, broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

C. Collect and remove waste materials, debris, and rubbish from site weekly and dispose off-site.

3.16 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

3.17 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect erosion control devices on a weekly basis and after each runoff event. Make necessary repairs to ensure erosion and sediment controls are in good working order.

C. Field test concrete in accordance with Section 03 30 00.

D. Compaction Testing: As specified in Section 31 23 23.

E. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

F. Frequency of Compaction Testing: One for each lift.

3.18 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. When sediment accumulation in sedimentation structures has reached a point one-third depth of sediment structure or device, remove and dispose of sediment.

C. Do not damage structure or device during cleaning operations.

D. Do not permit sediment to erode into construction or site areas or natural waterways.

E. Clean channels when depth of sediment reaches approximately one half channel depth.

3.19 PROTECTION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Immediately after placement, protect paving from premature drying, excessive hot or cold temperatures, and mechanical injury.

C. Do not permit construction traffic over paving for 7 days minimum after finishing until 75 percent design strength of concrete has been achieved.

D. Protect paving from elements, flowing water, or other disturbance until curing is completed.

3.20 Rip Rap

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Do not place riprap over frozen or spongy subgrade surfaces.

C. Place geotextile fabric over substrate, lap edges and ends.

D. Place riprap at culvert pipe ends and the discharge piping as indicated on Drawings.

E. Installed Thickness: 24-inch average.

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SECTION 32 11 23

AGGREGATE BASE COURSES

GENERAL

1.1 SUMMARY

A. Section Includes:
1. Base Aggregate Dense.
2. Geotextile Fabric – Street Subgrade.

B. Related Sections:
1. Section 31 23 17 – Trenching & Backfilling: Compacted fill under base course.
2. Section 32 12 16 - Asphalt Paving: Binder and finish asphalt courses.
3. Section 32 91 19 - Landscape Grading: Topsoil fill at areas adjacent to aggregate base course.
4. Section 33 05 13 - Manholes and Structures

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Base Aggregate Dense
1. Basis of Measurement: By the ton of the size specified in the bid form to elevations and thicknesses indicated on Drawings. Load Tickets shall be provided to the Engineer by the end of the work day following the date the Base Aggregate was placed.
2. Basis of Payment: Includes supplying fill material, stockpiling, scarifying substrate surface, placing where required, watering, drying, finishing, and compacting, and incidentals necessary to complete the work.

B. Geotextile Fabric – Street Subgrade
1. Basis of Measurement: By the square yard of surface area upon which fabric has been placed as indicated on Drawings or as directed by the Engineer.
2. Basis of Payment: Includes furnishing, transporting, and installing the fabric; and for furnishing all labor, tools, and equipment necessary to complete the work.

C. Shouldering
1. Basis of Measurement: By the lineal foot of material placed to the thickness, slope and width indicated on the Drawings.
2. Basis of Payment: Includes placing where required, watering, drying, finishing, and compacting, and incidentals necessary to complete the work.

D. Gravel Driveway
1. Basis of Measurement: By the ton of the size specified in the bid form to elevations, thicknesses and dimensions indicated on Drawings. Load Tickets shall be provided to the Engineer by the end of the work day following the date the Base Aggregate was placed.

2. Basis of Payment: Includes supplying fill material, stockpiling, scarifying substrate surface, placing where required, watering, drying, finishing, and compacting, and incidentals necessary to complete the work.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
2. Wisconsin Department of Transportation Standard Specifications

1.4 SUBMITTALS

A. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

B. Material sources and gradations shall be submitted to the Engineer for review. A sample of material from each source shall be submitted to the Engineer for testing and approval prior to construction.

1.5 QUALITY ASSURANCE

A. Aggregates furnished for the work shall conform to quality and gradation requirements hereinafter set forth. Furnish each aggregate material from single source throughout the Work.

B. Perform Work in accordance with Sections 301 and 305 of the State of Wisconsin Department of Transportation, Standard Specifications for Highway and Structure Construction, latest edition.

C. The Engineer may prohibit the use of crushed stone from limestone/dolomite deposits that have thinly bedded strata or strata of a shale nature. The Engineer may also prohibit the use of aggregate from deposits or sources known to produce unacceptable material.

PART 2 PRODUCTS

2.1 AGGREGATE MATERIALS

A. The aggregates shall be well graded between the limits specified and conform to the following gradation requirements:

| Percentage by Weight Passing (WDOT 305.2.2.) | | | |
|---|---|---|---|
| Sieve No. | Base Aggregate Dense, 3-inch | Base Aggregate Dense, 1¼-inch | Base Aggregate Dense, ¾-inch |
| 3 inch | 90-100 | --- | --- |
| 1½ inch | 60-85 | --- | --- |
| 1¼ inch | --- | 95-100 | --- |
| 1 inch | --- | --- | 100 |
| ¾ inch | 40-65 | 70-93 | 95-100 |
| ⅜ inch | --- | 42-80 | 50-90 |
| No. 4 | 15-40 | 25-63 | 35-70 |
| No. 10 | 10-30 | 16-48 | 15-55 |
| No. 40 | 5-20 | 8-28 | 10-35 |
| No. 200 | 2.0-12.0 | 2.1-12.0 [1 3]* | 5.0-15.0 [2] |
| [1] Limited to a maximum of eight percent in base course placed between old and new pavement.<br>[2] 8.0-15.0 percent, if base is ≥50 percent crushed gravel.<br>[3] 4.0-10.0 percent, if base is ≥50 percent crushed gravel. | | | |

B. Base Aggregate: 5-inch Select.

| Sieve Size | Percent Passing |
|---|---|
| 5 inch | 90-100 |
| 1-1/2 inch | 20 to50 |
| No. 10 | 0 to 10 |

C. Open Graded Base Course.

| Sieve No. | Open Graded, 3-inch | Open Graded, 1-inch |
|---|---|---|
| 3 inch | 100 | --- |
| 2½ inch | 90-100 | --- |
| 1½ inch | 25-60 | --- |
| 1 inch | --- | 90-100 |
| ¾ inch | 0-20 | --- |

| | | |
|---|---|---|
| ⅜ inch | 0-5 | 45-65 |
| No. 4 | --- | 15-45 |
| No. 10 | --- | 0-20 |
| No. 40 | --- | 0-10 |
| No. 200 | --- | 0-5 |

2.2 ACCESSORIES

A. Geotextile Fabric: Mirafi 600X, or approved equal.

B. Geogrid Reinforcement: Geogrid shall be Tensar Tx140, Syntex SBX 11 (Type 1) or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify compacted substrate is dry and ready to support paving and imposed loads.
   1. Contractor shall notify Engineer 24 hours prior to when the proof roll will take place.
   2. Proof roll substrate with fully loaded tri-axle truck to indentify soft spots.
   3. Remove soft substrate and replace with compacted fill or dense graded base – 3 inch or 5 inch select if approved by Engineer.
   4. Engineer will cross-section EBS to determine volume in place.
   5. Engineer's recommendations shall not relieve Contractor of their warranty obligations.

C. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

A. Prior to placing crushed aggregate base course, the roadway subgrade shall be compacted. The roadway subgrade shall be fine graded to elevations shown on the plan based on the roadway profiles and typical sections.

B. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

C. Do not place fill on soft, muddy, or frozen surfaces.

D. Water and rework or re-compact dry foundations as necessary to ensure proper compaction, or as the engineer directs.

E. Correct all soft or yielding areas, holes, or other defects that occur due to traffic, hauling, poor drainage, unstable materials, or from any other cause before placing the base.

3.3 AGGREGATE PLACEMENT

A. Place aggregate equal thickness layers to total compacted thickness and width indicated on Drawings.

B. Roller compact aggregate to 95 percent maximum density.

C. All equipment used for hauling and spreading crushed aggregate base course shall be the weight, type, capacity, and method of operation such that no damage will result to the existing subgrade or base course in place. Equipment used for spreading shall be designed and operated to spread the material in uniform layers without significant segregation.

D. Equipment used for densification or compaction shall be of the static type, vibratory type, or a combination of both types.

E. If using a pneumatic roller, do not exceed a compacted thickness of 6 inches per layer. For the first layer placed over a loose sandy subgrade,

F. Level and contour surfaces to elevations, profiles, and gradients indicated.

G. Maintain optimum moisture content of fill materials to attain specified compaction density.

H. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

I. When aggregates are measured by the ton, scales or weighing equipment shall be tested by the Engineer or by authorized testing firms or agencies as often as the Engineer deems necessary to insure their accuracy.

J. Prior to acceptance of the Crushed Aggregate Base Course, all areas shall be proof rolled with a loaded tandem-axle truck, to be observed by the Engineer. If this test roll shows any deflection or cracking of the base course, the base course shall be removed in these areas and subgrade excavated as necessary to remove all wet or unsuitable material. These areas shall be backfilled with approved material as directed by the Engineer.

K. The Contractor shall be responsible for and maintain the base course until accepted.

L. The Contractor shall minimize the dispersion of dust from the base course, including shoulders, during construction and maintenance operations, until acceptance of the base course, by the application of water or other approved dust control materials as provided in the contract or required by the Engineer.

M. Install geotextile fabric over subgrade in accordance with manufacturer's instructions when directed by Engineer.
   1. Lap ends and edges minimum 6 inches (150 mm).
   2. Anchor fabric to subgrade when required to prevent displacement until aggregate is installed.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Flat Surface: 1/4 inch measured with 10 foot straight edge.

C. Maximum Variation From Thickness: 1/4 inch.

D. Maximum Variation From Elevation: 1/2 inch.

3.5 FIELD QUALITY CONTROL

A. Compaction testing will be performed in accordance with ASTM D1557 by Owner.

B. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

C. Frequency of Tests: As determined by Owner.

3.6 COMPACTION

A. Compact materials to 98 percent of maximum density as determined from test strip, in accordance with ASTM D2940.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Asphalt materials.
   2. Aggregate materials.
   3. Aggregate subbase.
   4. Asphalt paving upper layer and lower layer.
   5. Tack coat.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. HMA Pavement - Upper Layer:
   1. Basis of Measurement: By ton or square yard to the thickness indicated on the Bid Form. Load tickets shall be provided to the Engineer.
   2. Basis of Payment: Includes full compensation for furnishing, preparing, hauling, mixing, and placing of all materials, compacting the mixture, and for all labor, tools, equipment, and incidentals necessary to complete the work.

B. HMA Pavement - Lower Layer:
   1. Basis of Measurement: By ton or square yard to the thickness indicated on the Bid Form. Load tickets shall be provided to the Engineer.
   2. Basis of Payment: Includes full compensation for furnishing, preparing, hauling, mixing, and placing of all materials, compacting the mixture, and for all labor, tools, equipment, and incidentals necessary to complete the work.

C. HMA Pavement – Driveways:
   1. Basis of Measurement: By ton or square yard to the thickness indicated on the Bid Form. Load tickets shall be provided to the Engineer.
   2. Basis of Payment: Includes full compensation for furnishing, preparing, hauling, mixing, and placing of all materials, compacting the mixture, and for all labor, tools, equipment, and incidentals necessary to complete the work.

D. Tack Coat:
   1. Basis of Measurement: By square yard.
   2. Basis of Payment: Includes full compensation for furnishing tack coat; for preparing the surface; for transporting and heating; for diluting with water; and for maintaining the completed work.

E. The paving contractor shall be responsible for determining to his/her satisfaction that the base course layer is established to the proper elevation prior to paving. Additional payment will not be made for extra depth due to the level of the base course.

1.3 REFERENCES

A. State of Wisconsin Department of Transportation Standard Specifications and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications).

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
   1. Submit product information for asphalt and aggregate materials.
   2. Submit mix design with laboratory test results supporting design.

B. Material Certificates: For each paving material, from manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the Wisconsin Department of Transportation.

B. Perform Work in accordance with Sections 450, 455, 460, and 465 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications).

C. Quality Management Program (QMP) provisions are not required on this project.

1.6 PROJECT CONDITIONS

A. Transporting and Delivering Mixtures
   1. Deliver the mixture to the paver receiving hopper at a temperature between 260-300° F. Asphalt delivered below 260° F may be rejected by Engineer. Cover all loads during inclement weather or when the ambient air temperature falls below 65° F.

B. Environmental Limitations:
   1. Tack Coat: Apply tack coat only when the air temperature is 36° F or more and the surface is dry and reasonably free of loose dirt, dust, or other foreign matter. Do not apply if weather or surface conditions are unfavorable or before impending rains.

   2. Place asphaltic mixture only on a prepared, firm and compacted base, foundation layer, or existing pavement substantially surface-dry and free of loose and foreign material. Do not place over frozen subgrade or base, or when the roadbed underlying the foundation or base is temporarily unstable from the effects of frost heaving. Unless the contract provides otherwise, incorporate loose roadbed aggregate as a part of preparing the foundation, in shoulder construction, or dispose of as the engineer approves.

   3. Do not place asphaltic mixture when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 36 F for upper layers or 32 F for lower layers unless the engineer allows in writing. The contractor should place HMA pavement for projects in the northern asphalt zone between May 1 and October 15 inclusive and for projects in the southern asphalt zone between April 15 and November 1 inclusive. WisDOT CMM 4-53 figure 2 defines asphalt zones. Notify the engineer at least one business day before paving.

4. Submit a written cold weather paving plan to the engineer at the preconstruction meeting. In that plan outline material, operational, and equipment changes for paving when the air temperature approximately 3 feet above grade, in shade, and away from artificial heat sources is less than 40 F. Include the following:
   a. Use a WisDOT-accepted HMA mix design that incorporates a warm mix additive from the department's approved products list. Do not use a foaming process that introduces water into the mix.
   b. Identify the warm mix additive and dosage rate.
   c. Identify modifications to the compaction process and when to use them.
   d. Engineer written acceptance is required for the cold weather paving plan. Engineer acceptance of the plan does not relieve the contractor of responsibility for the quality of HMA pavement placed in cold weather.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.

B. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.

C. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO M 320, Performance Graded Binder as specified:
   1. PG 58-28

B. Tack Coat: ASTM D 977 emulsified asphalt or ASTM D 2397 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

2.3 MIXES

A. Asphalt Paving Mixtures: Design in accordance with HMA Pavement LT 58-28 S of Section 460 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition, and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications), unless otherwise noted.

B. Asphaltic mixture, which, in the judgment of the Engineer, is not sufficiently mixed or is defective in another manner, will be rejected.

C. POROUS PAVEMENT (Alternate)

Mix Properties:
- Aggregates shall be in conformance with WisDOT Specifications for 9.5 mm
- Asphalt binder shall be grade PG 58-28+12GTR modified AC with rubber.
- Asphalt binder content shall be between 5.7% - 6.0%.
- Air Voids shall be 18% - 20% (Va at 50 Gyrations).
- Tensile Strength Ratio (TSR at 5 cycles freeze/thaw) shall be 80% min. per

ASTM D4867.
- Draindown at production temperature shall be 0.3% maximum.
- Granulated rubber at 1% - 3% of 15-minus by weight of mix.
- High temperature fibers (minimum of 450 degree flash point) at 3-5 pounds per ton of mix.
- Recycled Asphalt Product (RAP) at 10% max.

Aggregate Properties
- LA Abrasion loss of 13% max. @ 100 revolutions; 45% max. @ 500 revolutions per AASHTO T 96.
- Soundness at 12% max. loss per AASHTO T 104.
- Freeze-Thaw loss at 18% max. per AASHTO T 103
- Fractured faces: 2 faces – 90% min; 1 face 100% min.
- Thin or elongated: 5% max 5:1 ration per ASTM D4791.

**Mixture Gradation**

| **Sieve** | |
|---|---|
| 3/4" | - |
| 1/2" | 100 |
| 3/8" | 90 -100 |
| #4 | 30 - 40 |
| #8 | 10 -20 |
| #16 | 5 - 15 |
| #30 | 3 -10 |
| #200 | 1 - 4 |
| VMA (%) | 25 min |

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll the sub-base with a loaded tri-axle dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Contractor shall notify Engineer to inform him when proof rolling will take place. Provide a minimum of 24 hours notice. Engineer's recommendations shall not relieve Contractor of their warranty obligations.

B. Proceed with paving only after unsatisfactory conditions have been corrected.

C. Verify gradients and elevations of base are correct.

D. Verify structure grates, frames, lids are installed in correct location and elevation.

3.2 EXISTING WORK

A. Saw cut and notch existing paving as indicted on Drawings. Recompact existing unbound-aggregate base course to form new subgrade.

B. Clean existing paving to remove foreign material, excess joint sealant and crack filler from paving surface.

Repair surface defects in existing paving to provide uniform surface to receive new paving.

3.3 TACK COAT

A. Apply tack coat in accordance with Section 455 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications).

3.4 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

3.5 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. Place asphalt pavement in accordance with Section 460 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications).

B. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.6 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
   3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
   4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

3.7 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

B. Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted in accordance with Section 460 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway*

*and Structure Construction*, latest Edition and Additional Special Provision 6 (ASP 6 – Modifications to the standard specifications).

C. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

D. Compact all layers of HMA mixture to 91.5% of target maximum density. The lower layer may be reduced to 89.5% if constructed directly on crushed aggregate.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Lower Layer: Plus or minus 1/4 inch (6 mm).
   2. Upper Layer: Plus 1/4 inch (6 mm), no minus.

3.9 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Fertilizing.
2. Seeding.
3. Hydroseeding.
4. Mulching.
5. Maintenance.
6. Watering.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Restoration with Seed, Fertilizer and Mulch:
1. Basis of Measurement: By square yard.
2. Basis of Payment: Seed, Fertilizer and Mulch will be measured and paid for at the contract unit price per square yard, which shall be full compensation for seed, fertilizer, and mulch in areas disturbed by the work as determined by the Engineer; for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

B. Watering:
1. Basis of Measurement: Per Each Required.
2. Basis of Payment: Watering shall be measured and paid for at the contract unit price per each which shall include all labor, tools, equipment, and incidentals as necessary to complete the work. Water will be supplied by Owner.

1.3 REFERENCES

A. ASTM International:
1. ASTM C602 - Standard Specification for Agricultural Liming Materials.

1.4 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data for seed mix, fertilizer, mulch, and other accessories.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Include maintenance instructions, cutting method and maximum grass height.

1.7 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.

B. Perform Work in accordance with Section 630 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

C. Conform to the Wisconsin statutes and Wisconsin administrative code chapter ATCP 20 regarding noxious weed seed content and labeling.

D. Use seed within one year of the test date appearing on the label.

E. Purity and Germination: Seed shall be tested when required in accordance with the methods and procedures used for the sampling and analyzing seed for purity and germination and noxious weed seed content as prescribed by the current edition of Rules for Testing Seed, published by the Association of Official Seed Analysis. Purity and germination shall conform to table of seed mixtures outlined in Section 630.2 of the State of Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction*.

1.8 QUALIFICATIONS

A. Seed Supplier: Company specializing in manufacturing Products specified in this section and State-certified seed of grass species.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

C. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

D. Any seed delivered prior to use shall be stored in such a manner that it will be protected from damage by heat, moisture, insects, and rodents. Any previously tested and accepted seed that has become damaged shall be discarded and replaced by the Contractor.

1.10 MAINTENANCE SERVICE

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance service.

B. Maintain seeded areas immediately after placement until grass is well established and exhibits vigorous growing condition.

PART 2 PRODUCTS

2.1 SEED MIXTURE

A. Furnish Seeding Mixture in accordance with Section 630 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition or as approved by the Engineer.
   1. Seed Mixture No. 40 shall be used in urban or other areas where a lawn type turf is preferred.
   2. In non-urban areas where a lawn type turf is not preferred, the appropriate seed mixture as indicated in Section 630 of the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, latest Edition shall be used.

2.2 ACCESSORIES

A. Mulching Material shall be in accordance with Section 627 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition or as approved by the Engineer.
   1. Mulching material shall consist of any straw or hay, or other fibrous material of similar nature, which is free of noxious weed seed and objectionable foreign matter.
   2. Tackifier material shall be an organically-based material compatible for use with the specified seed and/or Hydroseeding. The tackifier shall not inhibit plant growth and shall effectively bind mulch material to the soil until plant material is established. Tactifier shall be selected from the Wisconsin Department of Transportation's erosion control product acceptability list (PAL).

B. Fertilizer shall be in accordance with Section 629 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition or as approved by the Engineer.
   1. Each container of packaged fertilizer shall be plainly marked with the analysis of the contents showing minimum percentages of total nitrogen, available phosphoric acid and soluble potash. When the fertilizer is furnished in bulk, each shipment shall be accompanied by an invoice indicating the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash in the contents.
   2. Fertilizer shall be Type B and shall meet the following minimum requirements: nitrogen 16, phosphoric acid 6, soluble potash 24.

C. Lime shall be in accordance with Section 629 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition or as approved by the Engineer.

D. Water: Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

2.3 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify prepared soil base is ready to receive the Work of this section.

3.2 MULCH

A. Unless otherwise directed, the mulch shall be placed on a given area within two days after the seeding has been completed.

B. Mulching operations shall not be performed during periods of excessively high winds, which preclude the proper placing of the mulch.

C. The placed mulch shall be loose or open enough to allow some sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, conserve soil moisture and prevent or reduce erosion. The Contractor shall maintain the mulched areas and shall repair any areas damaged by wind, erosion, traffic, fire or other causes prior to final or partial acceptance of work under the contract.

D. Placement: The Contractor, unless otherwise specified may place mulch in accordance with either Method A or Method B as described below:
   1. **Method A**. The straw or hay mulch shall be placed by either hand or mechanical means. The mulching material shall be uniformly spread over the designated areas to loose depth of ½ to 1 ½ inches. The mulch material from compacted bales shall be well loosened and made fluffy prior to placement. The target of application will be approximately 100 pounds per 1000 square feet. Straw or hay mulch shall be securely anchored with a disk, clodbuster or other approved equipment. Unless the Engineer directs otherwise, begin mulching at the top of the slopes and proceed downward.
   2. **Method B**. The straw or hay mulch or other fibrous material shall be placed by means of Hydroseeding.

3.3 FERTILIZING

A. Fertilizer and Lime shall be applied in accordance with the requirements of Section 629 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

B. The fertilizer selected for the seeding areas shall be uniformly applied thereon and incorporated in the soil by light discing or harrowing. Granular fertilizer shall be pulverized and free from lumps when applied. When fertilizer is incorporated with topsoiled areas, the fertilizer may be applied just prior to and in conjunction with the final discing or harrowing operations of the topsoil, or in the event the topsoil is manipulated by hand, just prior to the final raking and leveling.

C. In the event fertilizer is to be placed on seeding areas where the seed is to be sown by means of a spray or stream of water under pressure, the required amount of fertilizer may be placed in the tank, mixed together with the water and the seed, and constantly agitated and applied in the seeding operation. Fertilizer applied by this method will not require discing or harrowing after being placed.

D. Rate: Apply Fertilizer at 7 pounds per 1,000 square foot area.

3.4 SEEDING

A. Grading, shouldering, topsoiling and fertilizing items, when part of the work under the contract, shall be completed before permanent seeding, except that when equipment designed for the purpose is used, the fertilizer and seed mixture may be placed in one operation.

B. The area to be seeded shall be worked with discs, harrows, or other appropriate equipment until a reasonably even and loose seedbed is obtained immediately in advance of the seeding.

C. Seeding: Unless otherwise specified, seeds may be sown at the option of the Contractor, by either Method A or Method B described below:

1. **Method A**. The selected seed mixture shall be sown by means of equipment adapted to the purpose, or it may be scattered uniformly over the areas to be seeded, and lightly raked or dragged to cover the seed with approximately one-fourth inch of soil. After seeding, the areas shall be lightly rolled or compacted by means of suitable equipment not exceeding 112 lbs/linear foot, preferably of the cultipacker type when in the judgment of the Engineer the seedbed is either too loose or contains clods, which would reduce the germination of the seed. Slopes steeper than three to one need not be rolled.

   Scattering seed shall be done only with satisfactory hand seeders and only at such times when the air is sufficiently quiet to prevent seeds from blowing away.

2. **Method B.** Upon the prepared seedbed, the seed shall be sown or spread by means of a stream or spray of water under pressure operated from an approved type of machine designed for that purpose. The selected seed mixture and water shall be placed into a tank, provided within the machine, in sufficient quantities that when

the contents of the tank are sprayed on a given area the seed will be uniformly spread at the required rate of application. During the process, the contents of the tank shall be kept stirred or agitated to provide uniform distribution of the seed. The contents of the tank shall be emptied within one hour after the seed is added to the tank. Seed, which is allowed to remain mixed with the water for longer than one hour, shall be rejected. Dragging or rolling will not be required.

D. Seeding Rate: Sow seeds uniformly at a minimum rate of 2 pounds per 1000 square feet of area for Seed Mixture No. 40. For other seed mixtures, seeding rate shall conform to Section 630.3.3.5 of the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

E. Do not seed areas in excess of that which can be mulched on same day.

F. Do not sow immediately following rain, when ground is too dry, or when winds are over 12 mph.

G. Roll seeded area with roller not exceeding 112 lbs/linear foot.

H. Immediately following seeding and compacting, apply mulch to thickness of 1/2 to 1-1/2 inches. Maintain clear of shrubs and trees.

I. Cleanup: All ground area disturbed as a result of the seeding operation shall be renovated to its original condition or to the required new appearance.

J. Acceptability: When germination is complete and plants are visible, the Contractor shall notify the Engineer and request a germination inspection. Germination shall be deemed acceptable when all seed areas have evidence of germination and strong growth as determined by the Engineer, and where scattered bare spots not greater than one square foot do not exceed 10 percent of the area seeded.

K. All washouts shall be regraded and reseeded immediately after the germination inspection. No partial acceptance will be made.

L. All seeded areas that do not have a uniform germination by October 15 will not be accepted by the Engineer until the following spring when the criteria stated above is met.

3.5 HYDROSEEDING

A. Apply fertilizer, mulch and seeded slurry with hydraulic seeder at the required application rate.

B. Hydroseeding shall have continuous agitation action that keeps the seed mixed in the water slurry until pumped from the tank, and the pump pressure shall be such that a continuous nonfluctuating stream is maintained. Flood type nozzles shall be used to the fullest extent possible along with sufficient water volume to obtain total ground coverage.

C. All materials used in Hydroseeding shall meet the requirements specified for the class of material named.

D. Every effort shall be taken to obtain a uniform distribution over the seeded area. If a non-uniform distribution results, such as skipped areas and saw tooth patterns, the affected areas shall be reseeded at the Contractors expense. The seed-fertilization mixture shall be emptied within one hour after the seed is added to the tank. Seed that is allowed to remain mixed with the fertilizer for a period of longer than one hour will not be accepted for use and no compensation will be made for seed so rejected. All ground area disturbed as a result of Hydroseeding operation shall be renovated to its original condition.

E. After application, apply water with fine spray immediately after each area has been hydroseeded.

F. Application Rate: The minimum application rates for hydroseeding shall be 6 pounds of seed per 1000 square feet, 8 pounds of fertilizer per 1000 square feet, and 40 pounds mulch per 1000 square feet. When specified by the contract a tackifier material such as Finn Hydro-stick shall be included in the Hydroseeding Mixture and applied at 60 pounds per acre, or as recommended by the Engineer.

3.6 SEED PROTECTION

A. Cover seeded slopes as indicated on the Drawings with erosion fabric. Roll fabric onto slopes as indicated on the Drawing details without stretching or pulling.

B. Lay fabric smoothly on surface, bury top end of each section in 6 inch deep excavated topsoil trench. Overlap edges and ends of adjacent rolls minimum 12 inches. Backfill trench and rake smooth, level with adjacent soil.

C. Secure outside edges and overlaps at 36 inch intervals with stakes.

D. Lightly dress slopes with topsoil to ensure close contact between fabric and soil.

E. At sides of ditches, lay fabric laps in direction of water flow. Lap ends and edges minimum 6 inches.

3.7 MAINTENANCE

A. Contractor shall be responsible to actively maintain new seeding for the first 30 days. Additional maintenance may be required depending on weather and to ensure that an adequate cover is established throughout the warranty period.

3.8 WATERING

A. Water new seeding as required to ensure establishment of newly seeded areas as directed by Engineer.

END OF SECTION

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SECTION 33 01 32

SEWER AND MANHOLE TESTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Testing Gravity Sewer Piping:
a. Low-pressure Air Test.
b. Infiltration Test.
2. Deflection Testing Plastic Piping.

B. Related Sections:
1. Section 33 01 31 - Manhole Grade Adjustment.
2. Section 33 31 00 - Sanitary Utility Sewerage Piping.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Sewer and Manhole Testing:
1. Basis of Measurement: Sanitary sewer testing shall be incidental to new sanitary sewer main construction unless otherwise indicated on the bid form.

1.3 REFERENCES

A. ASTM International:
1. ASTM C1244 - Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill.
2. ASTM D2122 - Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Test Reports: Indicate results of piping tests.

PART 2 PRODUCTS

2.1 AIR TEST EQUIPMENT

A. Air compressor.

B. Air supply line.

C. Shut-off valves.

D. Pressure regulator.

E. Pressure relief valve.

F. Stop watch.

G. Plugs.

H. Pressure gauge, calibrated to 0.1 psi.

2.2 DEFLECTION TEST EQUIPMENT

A. Go, No-Go mandrels.

B. Pull/retrieval ropes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify manholes and piping are ready for testing.

C. Verify trenches are backfilled.

D. Verify pressure piping concrete reaction support blocking or mechanical restraint system is installed.

3.2 PIPING PREPARATION

A. Lamping:
   1. Lamp gravity piping after flushing and cleaning.
   2. Perform lamping operation by shining light at one end of each pipe section between manholes; observe light at other end; reject pipe not installed with uniform line and grade; remove and reinstall rejected pipe sections; re-clean and lamp until pipe section achieves uniform line and grade.

B. Plug outlets, wye-branches and laterals; brace plugs to resist test pressures.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Testing Gravity Sewer Piping:
   1. Low-pressure Air Test:
      a. No low-pressure air test will be required on new sewer with active sewer laterals installed.
      b. Test each section of gravity sewer piping between manholes. Isolate the section of sewer line to be tested by means of inflatable stoppers or other suitable test

plugs. One of the plugs should have an inlet tap, or other provision for connecting a hose to a portable air control source.

c. Introduce air pressure slowly to approximately 4 psig.
   1) Determine ground water elevation above spring line of pipe for every foot of ground water above spring line of pipe, increase starting air test pressure by 0.43 psig; do not increase pressure above 10 psig.

d. Allow pressure to stabilize for at least five minutes. Adjust pressure to 3.5 psig or increased test pressure as determined above when ground water is present. Start test.

e. Test:
   1) Determine test duration for sewer section with single pipe size from the following table. Do not make allowance for laterals.

| Pipe Diameter, in. | Minimum Time, min:s | Length for Minimum Time, ft | Time for Longer Length, s | Specification Time for Length (L) Shown, min:s | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 100 ft | 150 ft | 200 ft | 250 ft | 300 ft | 350 ft | 400 ft | 450 ft |
| 4 | 3:46 | 597 | 0.380L | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 | 3:46 |
| 6 | 5:40 | 398 | 0.854L | 5:40 | 5:40 | 5:40 | 5:40 | 5:40 | 5:40 | 5:42 | 6:24 |
| 8 | 7:34 | 298 | 1.520L | 7:34 | 7:34 | 7:34 | 7:34 | 7:36 | 8:52 | 10:08 | 11:24 |
| 10 | 9:26 | 239 | 2.374L | 9:26 | 9:26 | 9:26 | 9:53 | 11:52 | 13:51 | 15:49 | 17:48 |
| 12 | 11:20 | 199 | 3.418L | 11:20 | 11:20 | 11:24 | 14:15 | 17:05 | 19:56 | 22:47 | 25:38 |
| 15 | 14:10 | 159 | 5.342L | 14:10 | 14:10 | 17:48 | 22:15 | 26:42 | 31:09 | 35:36 | 40:04 |
| 18 | 17:00 | 133 | 7.694L | 17:00 | 19:13 | 25:38 | 32:03 | 38:27 | 44:52 | 51:16 | 57:41 |
| 21 | 19:50 | 114 | 10.470L | 19:50 | 26:10 | 34:54 | 43:37 | 52:21 | 61:00 | 69:48 | 78:31 |
| 24 | 22:40 | 99 | 13.674L | 22:47 | 34:11 | 45:34 | 56:58 | 68:22 | 79:46 | 91:10 | 102:33 |
| 27 | 25:30 | 88 | 17.306L | 28:51 | 43:16 | 57:41 | 72:07 | 86:32 | 100:57 | 115:22 | 129:48 |
| 30 | 28:20 | 80 | 21.366L | 35:37 | 53:25 | 71:13 | 89:02 | 106:50 | 124:38 | 142:26 | 160:15 |
| 33 | 31:10 | 72 | 25.852L | 43:05 | 64:38 | 86:10 | 107:43 | 129:16 | 150:43 | 172:21 | 193:53 |
| 36 | 34:00 | 66 | 30.768L | 51:17 | 76:55 | 102:34 | 128:12 | 153:50 | 179:29 | 205:07 | 230:46 |

   2) Record drop in pressure during test period; when air pressure has dropped more than 1.0 psig during test period, piping has failed; when 1.0 psig air pressure drop has not occurred during test period, discontinue test and piping is accepted.
   3) When piping fails, determine source of air leakage, make corrections and retest; test section in incremental stages until leaks are isolated; after leaks are repaired, retest entire section between manholes.

2. Test pipe larger than 36 inches diameter with exfiltration test not exceeding 100 gallons for each inch of pipe diameter for each mile per day for each section under test. Perform test with minimum positive head of 2 feet.

3. Infiltration Test:
   a. Use only when gravity piping is submerged in ground water minimum of 4 feet above crown of pipe for entire length being tested.

b. Maximum Allowable Infiltration: 100 gallons per inch of pipe diameter for each mile per day for section under test, include allowances for leakage from manholes. Perform test with minimum positive head of 2 feet.

C. Televising
1. All new sanitary sewer lines not air tested shall be televised with all televising costs being incidental to new main unless otherwise indicated on the bid form.
2. When sewer line flow is greater than televising equipment allows to effectively conduct the inspection, the Contractor shall control the flow at no additional cost to the owner by either plugging or pumping and bypassing. Contractor shall be liable for any damages which may result from sewer flow control.
3. The television camera picture quality shall be to the satisfaction of the Engineer and Owner. When televising is required, sanitary sewer will not be accepted for unsatisfactory televising.
4. Contractor shall provide Owner and Engineer with a hard copy report and video on a DVD or other approved media format. A VHS tape will not be accepted.

D. Pressure test force main in accordance with AWWA C600 and the following:
1. Hydrostatically test each portion of pressure piping, including valved section, at 1.5 times working pressure of piping based on elevation of lowest point in piping corrected to elevation of test gauge.
2. Conduct hydrostatic test for at least two-hour duration.
3. Fill section to be tested with water slowly, expel air from piping at high points. Install corporation cocks at high points. Close air vents and corporation cocks after air is expelled. Raise pressure to specified test pressure.
4. Observe joints, fittings and valves under test. Remove and renew cracked pipe, joints, fittings, and valves showing visible leakage. Retest.
5. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
6. Compute maximum allowable leakage by the following formula:

| |
|---|
| $L = (SD\sqrt{P})/C$ |
| L = testing allowance, in gallons per hour |
| S = length of pipe tested, in feet |
| D = nominal diameter of pipe, in inches |
| P = average test pressure during hydrostatic test, in psig |
| C = 148,000 |
| When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size. |

7. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

E. Deflection Testing of Plastic Sewer Pipe:
   1. Perform vertical ring deflection testing on PVC and ABS sewer piping. If deflection testing takes place within 30 days of placement of the final backfill, deflection may not exceed 5% of the original vertical internal diameter. Maximum deflection may not exceed 7.5% when testing occurs more than 30 days after placement of the final backfill.
   2. Perform deflection testing using properly sized rigid ball or 'Go, No-Go' mandrel.
   3. Furnish rigid ball or mandrel with diameter not less than 95 percent of base or average inside diameter of pipe as determined by ASTM standard to which pipe is manufactured. Measure pipe in compliance with ASTM D2122.
   4. Perform test without mechanical pulling devices.
   5. Locate, excavate, replace and retest pipe exceeding allowable deflection.

END OF SECTION

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SECTION 33 01 33

TV INSPECTION OF SEWER PIPELINES

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
   1. Pipeline flushing and cleaning.
   2. Television (TV) inspection of sewer pipelines.
   3. Audio-video recording of pipeline interior.
   4. Removal of intruding roots.

### 1.2 WORK INCLUDED

A. This work shall include cleaning and television (TV) inspection of sanitary sewer at the locations indicated on the Plans (found in the Appendix of these Specifications) and as required by these Specifications. This work shall include furnishing all tools, equipment, labor, and incidentals necessary to clean and TV inspect sanitary sewer mains.

### 1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. TV Inspection of Sewer Pipelines:
   1. Basis of Measurement: By linear foot.
   2. Basis of Payment: Includes pipeline flushing and cleaning, TV inspection, audio-video recording of pipeline, and providing digital video discs (DVDs) and written inspection logs.

### 1.4 REFERENCES

A. Plans titled "South Shore Sanitary System Map – Devils Lake State Park – 2013 Sanitary Sewer Televising – September, 2013", and "North Shore Sanitary System Map – Devils Lake State Park – 2013 Sanitary Sewer Televising – September, 2013"

B. "Pipe Data Table – South Shore – 2013 Sanitary Sewer Televising – Devils Lake State Park – September, 2013"

C. "Pipe Data Table – North Shore – 2013 Sanitary Sewer Televising – Devils Lake State Park – September, 2013"

D. Electronics Industries Association (EIA).

### 1.5 SUBMITTALS

A. Submit completed digital video discs (DVDs), identified by disc number, project name, pipe numbers, property name, and manhole numbers.

B. Discs become property of Devils Lake State Park.

C. Submit cleaning and television inspection logs for each section of sewer line to be televised and three copies of color DVDs for work performed.

1.6 QUALITY ASSURANCE

A. Use cameras with video output capable of producing minimum of 600 lines of horizontal resolution at center; optimum imagery with minimum illumination; and meet requirements of EIA Standard Video Signal.

1.7 QUALIFICATIONS

A. Company specializing in performing work of this section with minimum five years documented experience.

1.8 SCHEDULE

A. Televising field work shall be performed only on weekdays during periods of minimal use of the shower/toilet buildings to avoid the need for sewer bypassing during peak use periods of shower/toilet buildings.

B. All televising field work shall be completed prior to January 31, 2014.

1.9 COORDINATION

A. Coordinate work schedule with Vierbicher and Park Staff.

B. Contractor shall coordinate work schedule with Park Staff to avoid peak use periods of shower/toilet buildings.

PART 2 PRODUCTS

2.1 INSPECTION REPORTS

A. Video-Audio Recordings

1. DVD format digital video discs.

2. Audio track containing simultaneously recorded narrative commentary and evaluations of electrographer describing in detail condition of pipeline interior.

B. Written Inspection Logs

Include the following as minimum information: starting and ending manhole numbers, pipe number, stationing and location (clock references) of lateral services, wyes or tees, pipe joints, infiltration/inflow defects, cracks, leaks, offset joints, and other information required to assess condition of sewer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify location of sewer pipelines to be inspected with the Plans & Park Staff. PREPARATION

B. Flush and clean pipeline interiors to remove sludge, dirt, sand, stone, grease, and other materials from pipe to ensure clear view of interior conditions. The Contractor will be able to obtain water for cleaning from a hydrant within the Park.

C. Intercept flushed debris at next downstream manhole by use of weir or screening device, remove, and dispose of debris off site.

D. Temporarily plug influent pipes in upstream manhole to prevent flow through pipe to be cleaned and inspected.

3.2 APPLICATION

A. Closed-circuit TV Camera System:

1. Utilize cameras specifically designed and constructed for closed-circuit sewer line inspection. Utilize camera equipment with pan and tilt capability to view each lateral connection at multiple angles.

2. Utilize camera capable of moving both upstream and downstream; minimum 1,000 feet horizontal distance with one setup; direct reading cable position meter.

B. Field Quality Control

1. Pipeline Inspection:

a. Audio-video record sections of sewer pipeline between manholes designated on the attached "North Shore & South Shore Sanitary System Maps (2 sheets)".

b. Identify and record locations of flat grades, dips, deflected joints, open joints, broken pipe, protrusions into pipeline, and points of infiltration.

c. Locate and record service connections.

d. Record locations of pipeline defects and connection horizontal distance, in feet, and direction from manholes.

e. Video with pipe section plugged to ensure 100 percent view of the inside pipe diameter. Use bypass pumping system to eliminate upstream surcharging and/or reduced flow if the park shower/toilet buildings are in use at the time.

3.3 ROOT REMOVAL

A. Roots intruding into the pipe as shown by televising operations shall be completely cut from the pipe joints, removed from the sanitary sewer system, and properly disposed of off-site by the Contractor.

B. Root removal procedures may include the use of mechanical equipment such as rodding machines, bucket machines, winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners. Chemical root treatment may be used at the option of the Contractor.

END OF SECTION

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SECTION 33 05 14

PUBLIC MANHOLES AND STRUCTURES

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
   1. Modular precast concrete manholes and structures with tongue-and-groove joints with masonry transition to cover frame, covers, anchorage, and accessories.
   2. Doghouse manhole connections to existing storm sewer lines.
   3. Bedding and cover materials.

B. Related Sections:
   1. Section 03 10 00 - Concrete Forming and Accessories.
   2. Section 03 20 00 - Concrete Reinforcing.
   3. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
   4. Section 31 23 17 – Trenching and Backfilling
   5. Section 33 01 32 - Sewer and Manhole Testing.
   6. Section 33 31 13 - Public Sanitary Utility Sewerage Piping: Piping connections to manholes.
   7. Section 33 41 13 - Public Storm Utility Drainage Piping: Piping connections to manholes and structures.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Manholes, Inlets and Structures:
   1. Basis of Measurement: By each manhole, inlet or catch basin of the size specified on the bid form.
   2. Basis of Payment: Includes full compensation for excavation, bedding, compaction, backfilling, and furnishing all materials, including frames and lids, tools, equipment, labor and incidentals necessary to complete the work in accordance with the Contract Documents.

      Mac-Wrap and chimney seals, when required, shall be considered incidental to the cost of the manhole.

      Connection to existing sewers or structures shall be considered incidental to the cost of constructing storm and sanitary manholes and mains unless otherwise indicated on the bid form.

B. Adjust Existing Manhole:
   1. Basis of Measurement: By each when indicated on the bid form.
   2. Basis of Payment: Includes full compensation for providing all required materials, exclusive of frames, grates, or lids available and designated for adjusting; and for removing, reinstalling and adjusting the covers. The contractor shall replace covers rendered unusable by the contractor's operations, at no expense to the Owner.

C. Reconstruct Existing Manhole:
   1. Basis of Measurement: By each when indicated on the bid form.
   2. Basis of Payment: Includes full compensation for providing all required materials, including masonry and fittings; for salvaging and reinstalling existing covers, including frames, grates or lids; for all necessary excavation, backfilling, disposing of surplus material, and for cleaning out and restoring the work site.

D. Apron Endwalls:
   1. Basis of Measurement: By each of the size specified on the bid form.
   2. Basis of Payment: Includes full compensation for excavation, bedding, compaction, backfilling, and furnishing all materials, tools, equipment, labor and incidentals necessary to complete the work in accordance with the Contract Documents.

1.3 REFERENCES

A. American Association of State Highway Transportation Officials:
   1. AASHTO M288 - Geotextiles.
   2. AASHTO M306 - Drainage Structure Castings.

B. ASTM International:
   1. ASTM A48/A48M - Standard Specification for Gray Iron Castings.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
   4. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures.
   5. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate structure locations, elevations, piping, conduit, and sizes and elevations of penetrations.

C. Product Data: Submit manhole covers, component construction, features, configuration, dimensions

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction, Sixth Edition.

1.6 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Comply with precast concrete manufacturer's instructions and ASTM C913 for unloading, storing and moving precast manholes and drainage structures.

C. Store precast concrete manholes and drainage structures to prevent damage to Owner's property or other public or private property. Repair property damaged from materials storage.

D. Mark each precast structure by indentation or waterproof paint showing date of manufacture, manufacturer, and identifying symbols and numbers shown on Drawings to indicate its intended use.

PART 2 PRODUCTS

2.1 MANHOLES AND STRUCTURES

A. Furnish materials in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction, Sixth Edition.

B. Manhole and Structure Sections: Reinforced precast concrete in accordance with ASTM C478 with gaskets in accordance with ASTM C923.
   1. Joints for Precast Manholes and Structures: In accordance with ASTM C913; maximum leakage of 0.025 gallons per hour per foot of joint at 3 feet of head.

C. Inlets: Precast curb inlets shall be Type III (2'x3') or concrete manholes as indicated on the plans.

2.2 MANHOLE FRAMES AND COVERS

A. Manufacturers:
   1. Neenah Foundry Co. Model number as indicated on the plans with a Type B non-rocking lid with two (2) concealed pickholes.

2.3 INLET FRAMES AND COVERS

A. Manufacturers:
   1. Neenah Foundry Co.
      a. Frame: R-3067 unless otherwise called out on the plans
      b. Cover: Type R grates shall be installed at low points and Type L grates shall be installed at all other locations.

2.4 COMPONENTS

A. Manhole and Structure Steps: Formed polypropylene rungs.
   1. Steps shall be gray cast iron or fabricated ½ inch diameter grade 60 steel reinforcing rod with molded plastic covering.
   2. Steps shall withstand a horizontal pullout load of 400 pounds with the load applied over a width of 3-1/2" and centered on the rung.
   3. Steps shall conform to ASTM-C478 and shall be Neenah Foundry Co. R-1981-N or approved equal.

4. Steps shall be placed 16-inch on center and have a 5-3/4 inch projection from the wall.

B. Foundation Slab: Cast-in-place Precast concrete of type specified in Section 03 30 00, leveled top surface.

C. When shown on the plans, all sanitary manholes shall be wrapped with Mac-Wrap or approved equal.

D. Chimney seals, when called out on the plans, shall be internal rubber chimney seals, Cretex T1 or approved equal. Manholes with adjustment rings of 0" to 4.5" require double pleated chimney seals. Manholes with adjustment rings of 4.5" to 7.5" require triple pleated chimney seals.

2.5 CONFIGURATION

A. Shaft Construction and Eccentric Cone Top Section: Reinforced precast Concrete pipe sections, lipped male/female dry joints, sleeved to receive pipe.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: As indicated on Drawings.

D. Design Depth: As indicated on Drawings.

E. Clear Cover Opening: 24 inches diameter unless otherwise indicated on the plans.

F. Pipe Entry: Furnish openings as indicated on Drawings required.

G. Manhole Channels: Concrete invert, formed to same width as connecting pipe, with height of the vertical sides to ¾ of the pipe diameter. Form curved channels with smooth, uniform radius and slope.

H. Structure Joint Gaskets: ASTM C361; rubber.

I. Steps: 12 inches wide, 16 inches on center vertically, set rigidly into structure wall.

2.6 BEDDING AND COVER MATERIALS

A. Bedding: As specified in the plans.

B. Cover: As specified in the plans.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify items provided by other sections of Work are properly sized and located.

C. Verify built-in items are in proper location, and ready for roughing into Work.

D. Verify correct size of manhole and structure excavation.

3.2 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

B. Do not install manholes and structures where site conditions induce loads exceeding structural capacity of manholes or structures.

C. Inspect precast concrete manholes and structures immediately prior to placement in excavation to verify manholes and structures are internally clean and free from damage. Remove and replace damaged units.

3.3 INSTALLATION - GENERAL

A. Excavation and Backfill:
   1. Excavate for manholes and structures in accordance with Section 31 23 16 in location and to depth shown. Provide clearance around sidewalls of manhole or structure for construction operations and granular backfill.
   2. When groundwater is encountered, prevent accumulation of water in excavations. Place manholes or structures in dry trench.
   3. Where possibility exists of watertight manhole or structure becoming buoyant in flooded excavation, anchor manhole or structure to avoid flotation.

B. Install manholes and structures supported at proper grade and alignment on crushed stone bedding as shown on Drawings.

C. Backfill excavations for manholes and structures in accordance with Section 31 23 16.

D. Inlets shall be compacted around with a jumping jack or plate compactor.

E. Inlets and manholes shall have flow lines poured with concrete following installation.

F. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.

G. Set cover frames and covers level without tipping, to correct elevations.

H. When shown on the Drawings, chimney seals shall be installed according to manufacturer's recommendations.

3.4 PRECAST CONCRETE MANHOLE AND STRUCTURE INSTALLATION

A. Lift precast manholes and structures at lifting points designated by manufacturer.

B. When lowering manholes and structures into excavations and joining pipe to units, take precautions to ensure interior of pipeline and manhole or structure remains clean.

C. Set precast manholes and structures bearing firmly and fully on crushed stone bedding, compacted in accordance with provisions of Section 31 23 17 or on other support system shown on Drawings.

D. Assemble multi-section manholes and structures by lowering each section into excavation. Install rubber gasket joints between precast sections in accordance with manufacturer's recommendations. Lower, set level, and firmly position base section before placing additional sections.

E. Remove foreign materials from joint surfaces and verify sealing materials are placed properly. Maintain alignment between sections by using guide devices affixed to lower section.

F. Joint sealing materials may be installed on site or at manufacturer's plant.

G. Verify manholes and structures installed satisfy required alignment and grade.

H. Remove knockouts or cut structure to receive piping without creating openings larger than required to receive pipe. Fill annular space with mortar.

I. Cut pipe to finish flush with interior of manhole or structure.

J. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour to form continuous drainage channel as indicated on Drawings.

3.5 SANITARY MANHOLE DROP CONNECTIONS

A. Construct drop connections into sanitary manholes in accordance with Drawings.

B. Concrete encase pipe drop connection to minimum of 2 feet outside of manhole.

C. Form channel from pipe drop to sweep into main channel at maximum angle of 30 degrees.

3.6 CASTINGS INSTALLATION

A. Utility structures shall not be set to final elevations until the curb & gutter and base course have been installed, unless otherwise directed by the Engineer.

B. Set frames using mortar and masonry as indicated on Drawings. Install radially laid concrete brick with 1/4 inch thick vertical joints at inside perimeter. Lay concrete brick in full bed of mortar and completely fill joints. Where more than one course of concrete brick is required, stagger vertical joints.

C. Final rim elevations shall be ¼" to ½" below finish grade within paved areas. Rims that are set in excess of ½" below finished pavement shall be reset. Adjustment rings shall not exceed 7.5".

D. Set frame and cover 2 inches above finished grade for manholes and other structures with covers located within unpaved areas to allow area to be graded away from cover beginning 1 inch below top surface of frame.

3.7 ADJUSTING CATCH BASINS, MANHOLES, AND INLET COVERS

A. Adjust existing covers, including frames and grates or lids, to the required elevation shown on Drawings. Remove the existing fixture, adjust the top of the existing structure, and reinstall the fixture. Support the fixture on a collar of concrete, brick masonry, or concrete brick or block masonry, a precast concrete grade riser ring, or a grade adjustment ring as approved by the Engineer, constructed to hold the covers firmly in place.

B. Instead of adjusting the covers as specified above, the contractor may adjust the lids of covers on resurfacing projects, if the Engineer allows, by using Engineer-approved adjustment castings designed for the purpose.

C. Seal joints between manhole top, adjusting rings, and frame with sealant.

D. A vertical change exceeding one foot in the elevation of a cover, or requiring removal of masonry beyond the shimming or grade adjustment device, is a reconstruction and the contractor must comply with of reconstruction of catch basins, manholes, and inlets, as shown below.

3.8 RECONSTRUCING CATCH BASINS, MANHOLES, AND INLET COVERS

A. If the plan shows and the contract provides, reconstruct existing catch basins, manholes and inlets to the required lines and elevations the plans show, including the salvaging of existing covers, unless the contract provides for new covers or other salvaged covers.

B. Seal joints between manhole top, adjusting rings, and frame with sealant.

C. Use construction methods conforming to the requirements set forth above for the classes of work involved.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Test cast-in-place concrete in accordance with Section 03 30 00.

3.10 SCHEDULES

A. Manholes: Precast concrete sections, galvanized steel steps, not less than 48 inches inside dimension, to depth indicated, with bolted lid.

END OF SECTION

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SECTION 33 11 13

PUBLIC WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipe and fittings for public line including potable water line, and fire water line.
2. Tapping Sleeves and Valves.
3. Valves and Fire Hydrants.
4. Bedding and cover materials.
5. Abandon Existing Watermain.

B. Related Requirements:
1. Section 03 30 00 - Cast-In-Place Concrete: Concrete for thrust restraints.
2. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
3. Section 31 23 16 -Earthwork: Product and execution requirements for excavation and backfill required by this section.
4. Section 31 23 17 – Trenching and Backfilling: Execution requirements for trenching required by this section.
5. Section 33 05 14 - Public Manholes and Structures.
6. Section 33 12 13 - Water Service Connections
7. Section 33 12 16 - Water Utility Distribution Valves.
8. Section 33 12 19 - Water Utility Distribution Fire Hydrants.
9. Section 33 13 00 - Disinfecting of Water Utility Distribution: Disinfection of water piping.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price

B. Pipe and Fittings:
1. Basis of Measurement: By the linear foot for each size of main installed. Basis of Payment: Includes hand trimming excavation piping and fittings, bedding, concrete thrust restraints, connection to public utility water source.
2. Connecting to existing water mains shall be considered incidental to new water main construction.
3. Reducers, caps, tees, bends, and crosses will not be paid for separately, but will be considered incidental to the water main. Tracer wire, when required, will also be considered incidental to the water main.

C. Abandon Existing Water Main:
1. Basis of Measurement: By Lump Sum if indicated on the bid form.
2. Basis of Payment: Abandon existing water mains, fittings, and valves shall be payment in full for all excavation, removal, disposal, and backfill; and for furnishing of all labor, tools, equipment, and incidentals necessary to complete the work.

D. Styrofoam Insulation:
   1. Basis of Measurement: Per Each 4'x8' sheet.
   2. Basis of Payment: Full compensation for furnishing of materials, labor, tools, equipment, and incidentals necessary to complete the work.

## 1.3 REFERENCE STANDARDS

A. American Association of State Highway and Transportation Officials:
   1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. American Society of Mechanical Engineers:
   1. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

C. ASTM International:
   1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
   2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
   4. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   5. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   6. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
   7. ASTM D2241 - Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
   8. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   9. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
   10. ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
   11. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

D. American Water Works Association:
   1. AWWA C104 - ANSI Standard for Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
   2. AWWA C105 - ANSI Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
   3. AWWA C110 - ANSI Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In. (76 mm Through 1,219 mm), for Water.
   4. AWWA C111 - ANSI Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   5. AWWA C115 - ANSI Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.

6. AWWA C151 - ANSI Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
7. AWWA C153 - ANSI Standard for Ductile-Iron Compact Fittings for Water Service.
8. AWWA C200 - Steel Water Pipe 6 In. (150 mm) and Larger.
9. AWWA C203 - Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
10. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. and Larger - Shop Applied.
11. AWWA C206 - Field Welding of Steel Water Pipe.
12. AWWA C207 - Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In. (100 mm Through 3,600 mm).
13. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings.
14. AWWA C213 - Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
15. AWWA C300 - Reinforced Concrete Pressure Pipe, Steel-Cylinder Type.
16. AWWA C301 - Prestressed Concrete Pressure Pipe, Steel-Cylinder Type.
17. AWWA C500 - Gate Valves for Water and Sewage Systems.
18. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
19. AWWA C605 - Water Treatment - Underground Installation of Polyvinyl Chloride PVC Pressure Pipe and Fittings for Water.
20. AWWA C606 - Grooved and Shouldered Joints.
21. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case.
22. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service.
23. AWWA C702 - Cold-Water Meters - Compound Type.
24. AWWA C706 - Direct-Reading, Remote-Registration Systems for Cold-Water Meters.
25. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. through 12 In. (100 mm Through 300 mm), for Water Distribution.
26. AWWA C905 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In. Through 36 In. (350 mm Through 1,200 mm), for Water Transmission and Distribution.
27. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

E. Manufacturer's Standardization Society of the Valve and Fittings Industry:
1. MSS SP-60 - Connecting Flange Joint between Tapping Sleeves and Tapping Valves.

F. National Fire Protection Agency:
1. NFPA 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on pipe materials, pipe fittings, valves and accessories.

C. Shop Drawings: Indicate piping layout, including piping specialties.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

E. Test reports as specified in this section.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Valves: Mark valve body with manufacturer's name and pressure rating.

B. Perform Work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction.

C. Comply with requirements of water utility. Include tapping of water mains and backflow prevention.

D. Comply with standards of authorities having jurisdiction for fire protection systems. Include materials, hose threads, installation, and testing.

E. Fusible polyvinylechloride pipe:
   1. All piping shall be made from PVC compound conforming to cell classification 12454 per ASTM D1784.
   2. Fusion Technician shall be fully qualified by the pipe supplier to install fusible polyvinylchloride pipe of the type(s) and size(s) being used. Qualification shall be current as of the actual date of fusion performance on the project.
   3. Fusible polyvinylchloride pipe shall be used as manufactured under the trade names Fusible C-900®, Fusible C-905®, and FPVC®, for Underground Solutions, Inc., Poway, CA, (858) 679-9551. Fusion process shall be as patented by Underground Solutions, Inc., Poway, CA, Patent No. 6,982,051. Owner and Engineer are aware of no other supplier of fusible polyvinylchloride pipe that is an equal to this specified pipe supplier and products.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Deliver and store valves in shipping containers with labeling in place.

C. Block individual and stockpiled pipe lengths to prevent moving.

D. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

E. Store polyethylene materials out of sunlight.

1.8 EXISTING CONDITIONS

A. Verify field measurements prior to fabrication. Indicate field measurements on shop drawings.

PART 2 PRODUCTS

2.1 WATER PIPING

A. Water main pipe shall conform to Chapter 8.18.0 of the State of Wisconsin Standard Specifications for Sewer and Water Construction, Latest Edition.

B. Ductile Iron Pipe: AWWA C151. Bituminous outside coating: AWWA C151. Pipe Mortar Lining: AWWA C104, double thickness. Polyethylene Encasement: AWWA C105.
   1. Pipe Class: AWWA C151, Class 52 Ductile Iron Pipe
   2. Pipe Marking: Weight, class or nominal thickness, and casting period shall be shown on each pipe. Manufacturer's mark, the year in which the pipe was produced, and the letters "DI" or the word "Ductile" shall be cast or stamped on the pipe.
   3. Fittings: Ductile iron, AWWA C110. Compact fittings AWWA C153.
      a. Coating and Lining:
         1) Bituminous Coating: AWWA C110.
         2) Cement Mortar Lining: AWWA C104, double thickness.
      b. Lugged Retainer Glands: Approved mechanical joint lugged retainer glands (Mega Lug or equal) may be used with ductile iron or polyvinyl chloride pressure pipe.
   4. Joints:
      a. Mechanical and Push-On Joints: AWWA C111.
      b. Restrained Joints: Boltless, push-on type, joint restraint independent of joint seal.

C. Fusible Polyvinylchloride Pipe:

2.2 TAPPING SLEEVES AND VALVES

A. Tapping Sleeves:
   1. Manufacturer and Product List:
      a. Kennedy Valve Co.
      b. Mueller Co.

B. Tapping Valves:
   1. Manufacturer and Product List:
      a. Kennedy Valve Co.
      b. Mueller Co.

2.3 VALVES AND FIRE HYDRANTS

A. Valves: Conform to Section 33 12 16.

B. Fire Hydrants: Conform to Section 33 12 19.

2.4 ANCHORING

A. Metal tie rods and clamps or lugs: Galvanized steel sized in accordance with NFPA 24 thoroughly coated with bituminous paint.

2.5 BEDDING AND COVER MATERIALS

A. Bedding: Type 3 Embedment as specified in Section 31 23 17.

B. Cover: Type 3 Embedment as specified in Section 31 23 17.

C. Soil Backfill from Above Pipe to Finish Grade: Native backfill as specified in Section 31 05 13. Subsoil with no rocks over 6 inches in diameter, frozen earth or foreign matter.

2.6 FINISHES

A. Steel: Galvanizing, ASTM A123/A123M; hot dip galvanize after fabrication.

2.7 ACCESSORIES

A. Concrete for Thrust Restraints: Conform to Section 03 30 00. Wood blocking is not allowed.

B. Manhole and Cover: Conform to Section 33 05 14.

C. Steel rods, bolt, lugs and brackets: ASTM A36/A36M or ASTM A307 Grade A carbon steel.

D. Protective Coating: Bituminous coating.

E. Electrical conductivity across joints and fittings shall be provided according to the manufacturer's recommendations. Conductivity devices may be cable bond type or a copper conductivity strip. Either shall be capable of carrying 500 amperes continuously. Metal wedges are not permitted. Lead-tipped rubber gaskets or lead-caulked joints are not permitted.

F. For fittings and shortened pipe sections where cable bond type or copper conductivity type continuity devices are not provided by the manufacturer the Contractor shall field weld a lug onto the fitting, hydrant, valve or shortened pipe section and shall field install a strip or cable capable of carrying 500 amperes continuously between the sections. Cable bonds or copper conductivity strips can be installed around such fittings, valves or shortened pipe sections; but hydrants shall be equipped with continuity devices.

2.8 TRACER WIRE

A. Tracer Wire shall be ten (10) gauge (AWG) single strand copper wire with 60 mil of black, cross-linked polyethylene (XLPE) insulation specifically manufactured for direct burial applications.

2.9 STYROFOAM INSULATION

A. Provide 4'x8'x2" sheets of polystyrene insulation board that conforms to the requirements for Extruded Insulation Board, AASHTO Designation M230, except remove the flammability requirement.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify existing utility water main size, location, and invert are as indicated on Drawings.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Pre-Construction Site Photos:
   1. Take photographs along centerline of proposed pipe trench; minimum one photograph for each 50 feet of pipe trench.
   2. Show mail boxes, curbing, lawns, driveways, signs, culverts, and other existing site features.
   3. Include project description, date taken and sequential number on back of each photograph.

C. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs. Use only equipment specifically designed for pipe cutting. The use of chisels or hand saws will not be permitted. Grind edges smooth with beveled end for push-on connections.

D. Remove scale and dirt on inside and outside before assembly.

E. Prepare pipe connections to equipment with flanges or unions.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.

B. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.

C. Provide sheeting and shoring in accordance with Section 31 23 17.

D. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.

3.4 INSTALLATION - PIPE

A. Install pipe in accordance with AWWA C600.

B. Handle and assemble pipe in accordance with manufacturer's instructions and as indicated on Drawings.

C. Steel Rods, Bolt, Lugs, and Brackets: Coat buried steel with one coat of coal tar coating before backfilling.

D. Maintain 8 ft horizontal separation of water main from sewer piping and where water mains cross over sewers, maintain 6 inches minimum vertical separation and where water mains cross under sewers, maintain 18 inches minimum vertical separation in accordance with NR 811 code.

E. Cutting of Existing Mains: The Water Utility will operate all distribution system valves. The Contractor shall cut the water main, remove any plugs or caps, and pump the water out of the trench caused by cutting of the main or removal of the plugs or caps. All excavations required shall be made by the Contractor.

F. Install pipe to indicated elevation to within tolerance of 5/8 inches. Piping shall have a minimum cover of 6-1/2 feet below finished grade unless otherwise indicated.

G. Unless otherwise ordered, pipe shall be laid with the bell ends facing the direction of laying. When the grade exceeds 2 feet of rise per one hundred feet of trench, the bells shall face upgrade.

H. Line and Grade for Open-cut Construction: The Engineer will establish the centerline, locate changes in alignment, hydrant locations, and reference elevations at suitable intervals. The Contractor shall, at his own expense, furnish the necessary equipment and technical personnel to transfer the alignments and grades from stakes to the water main location. The Contractor shall check the alignment and grade of the water main at each staked station, or as directed by the Engineer. If it is determined that any or all water main is not installed in conformance with the staked plan or alignments and grades, the Contractor shall make the necessary corrections at his expense.

I. Obstructions in Line or Grade: Whenever it becomes necessary to lay a main over, under, or around a known obstruction and so shown on the plans, the Contractor shall furnish and install the required fittings. The laying of such fittings will considered incidental to the lineal foot of water main, unless accounted for on the bid form. No additional compensation will be paid to the Contractor for any expenses incurred because of such obstruction.

J. After placing a length of pipe in the trench, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. Precautions shall be taken to prevent foreign materials from entering the joint space and the joint recess shall be carefully checked for foreign material before the gasket is installed.

K. The pipe shall be secured in place with bedding material, placed by hand or equally careful means, keeping the bell end open. Pipe and fittings, which do not allow a

sufficient and uniform space for joints, shall be removed and replaced with pipe and fittings of proper dimensions to insure such uniform space.

L. Protection of Open Pipe: At all times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry. No pipe shall be laid in water or when in the opinion of the Engineer, trench conditions are unsuitable.

M. Cleaning of Pipe: The interior and exterior of all pipe shall be clean and free from all foreign material before being installed. The Contractor shall provide the necessary means to wipe, brush, swab or air blast to remove any foreign material from the interior of the pipe as directed by the Engineer.

N. Install ductile iron piping and fittings to AWWA C600.

O. Install Work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction standards.

P. Contractor shall have sufficient supplies on site to plan for varying conditions that will be encountered. Contractor shall coordinate with local businesses and residents to prepare for planned water shut-off's. If necessary for business or health considerations, Contractor shall provide temporary water services.

Q. Contractor shall obtain a safe water sample prior to acceptance of the new main.

3.5 INSTALLATION - VALVES AND HYDRANTS

A. Install valves in accordance with Section 33 12 16.

B. Install hydrants in accordance with Section 33 12 19.

3.6 INSTALLATION - TAPPING SLEEVES AND VALVES

A. Install tapping sleeves and valves in accordance with shop drawings and in accordance with manufacturer's instructions.

3.7 THRUST RESTRAINT

A. All mechanical joint fittings are to be restrained by thrust restraint retainer glands (Mega Lug or approved equal). This includes but is not limited to valves, tees, bends, caps, and plugs. Pour concrete thrust blocks against undisturbed earth. Locate thrust blocks at each elbow or change of pipe direction to resist resultant force and so pipe and fitting joints will be accessible for repair. Provide sq ft thrust restraint bearing on subsoil. Thrust restraint shall be provided for all joints within 30 feet of the above items.

B. Install tie rods, clamps, set screw retainer glands, or restrained joints. Protect metal restrained joint components against corrosion by applying a bituminous coating, or by concrete mortar encasement of metal area. Do not encase pipe and fitting joints to flanges.

C. Install thrust blocks, tie rods, and joint restraint at dead ends of water main.

3.8 SERVICE CONNECTIONS

A. Install service connections in accordance with Section 33 12 13.

3.9 ABANDON EXISTING WATER MAIN

A. Water mains shall be excavated and removed if it conflicts with new underground utilities or at the locations indicated on the plans. These mains shall be disposed of off-site. If not otherwise noted, existing mains may be plugged and abandoned in place.

B. All abandoned water mains shall be capped with a mechanical joint cap connected to the pipe end with a mega-lug or bolted to the flange of existing tees where applicable.

C. Caps shall be adequately blocked with solid concrete blocking or a poured concrete buttress.

D. Existing water valves to be abandoned shall be closed. The top section of the valve box shall be removed, and the remainder of the valve box shall be filled with 3/8" to 1" diameter clear stone.

E. No utilities shall be abandoned until new utilities are fully operational and have passed the testing requirements.

F. Fire hydrants shall be removed and salvaged to the Owner.

3.10 STYROFOAM INSULATION

A. Place 4'x8'x2" sheets of polystyrene insulation board where storm sewer crosses over water mains or laterals as indicated on the plans.

B. Prior to placement of polystyrene boards, bedding material shall be placed to a height of 6-12 inches over the top of the pipe, leveled, and compacted.

C. The insulating boards shall be placed on the cover material with the long side parallel to the centerline of the water main for a minimum width of 48". The boards shall be placed in a staggered arrangement so as to eliminate continuous transverse joints. If two or more layers of insulation board are used, each layer should be placed so as to cover the joints of the layer immediately below.

D. The first lift of backfill material shall consist of 6-inches of bedding material which shall be end or side dumped onto the insulation board and spread in such a manner that construction equipment does not operate directly on the insulation. This layer shall be compacted with equipment that exerts a contact stress of 70 to 80 psi. Once this layer has been compacted to the specified density, the remaining layers of backfill may be constructed utilizing conventional procedures.

3.11 TEMPORARY WATER SERVICE

A. Provide and pay for suitable quality water main and services as needed to maintain specified conditions for construction operations. Notify with Owner and affected property owners a minimum of 48 hours in advance of any water service shut off. Provide temporary ramping at driveways, intersections and sidewalks as necessary to protect temporary water main and service from vehicular and pedestrian traffic. Maintain temporary ramping until the new water main and services are installed and operational and the temporary water items have been removed. Connect to existing water source. Coordinate with Owner for metering water usage.

3.12 BACKFILLING

A. Backfill pipe in accordance with Section 31 23 17.

3.13 DISINFECTION OF POTABLE WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.14 FIELD QUALITY CONTROL

A. Tests Required: The Contractor shall conduct hydrostatic pressure and leakage tests under the supervision of the Owner or Engineer. Slip joint ductile iron water main shall be tested for electrical conductivity in a manner approved by the Engineer. The Contractor shall furnish all equipment and labor for the tests.

B. Pressure test system in accordance with AWWA C600 and the following:
1. Test Pressure: Not less than 150 psi or 50 psi in excess of maximum static pressure, whichever is greater.
2. Test pressure shall not exceed pipe or thrust-restraint design pressures.
3. Conduct hydrostatic test for at least two-hour duration.
4. Each valved section of pipe shall be slowly filled with water, and the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) shall be applied by means of a pump connected to the pipe. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
5. Air Removal: Before applying the specified test pressure, air shall be expelled completely from the section of piping under test.
6. Examination: All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until satisfactory results are obtained.
7. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
8. Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the

air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.

9. Compute maximum allowable leakage by the following formula:

| |
|---|
| $L = (SD\sqrt{P})/C$ |
| L = testing allowance, in gallons per hour |
| S = length of pipe tested, in feet |
| D = nominal diameter of pipe, in inches |
| P = average test pressure during hydrostatic test, in psig |
| C = 148,000 |
| When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size. |

10. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.
11. Acceptance of Installation. Acceptance shall be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified by the above formula, repairs or replacements shall be accomplished in accordance with the specifications.

C. Compaction Testing for Bedding: In accordance with ASTM D1557 if required by Engineer.

D. When tests indicate Work does not meet specified requirements, remove Work, replace and retest.

E. Frequency of Compaction Tests: one test per 500 feet of trench for each 2 foot lift if required by the Engineer.

END OF SECTION

SECTION 33 12 13

WATER SERVICE CONNECTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Pipe and fittings for domestic water service connections to buildings.
2. Corporations stop assembly.
3. Curb stop assembly.
4. Underground pipe markers.
5. Bedding and cover materials.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 31 05 13 - Soils for Earthwork.
3. Section 31 23 16 - Earthwork.
4. Section 31 23 17 – Trenching and Backfilling.
5. Section 33 13 00 - Disinfecting of Water Utility Distribution

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pipe and Fittings:
1. Basis of Measurement: By linear lineal foot. Basis of Payment: Includes full compensation for excavation, bedding, backfill, compaction, testing, and furnishing all materials, fittings, tools, equipment, labor and incidentals necessary to complete the work in accordance with the Contract Documents. New corporation stops, curb boxes, and reconnecting to existing laterals are incidental to water service construction unless accounted for as a bid item on the Bid Form.

B. Corporation Stop Assembly:
1. Basis of Measurement: By the unit. When no quantity is provided, it is incidental to the cost of water service construction.
2. Basis of Payment: Includes corporation stop, fittings and accessories.

C. Curb Stop Assembly:
1. Basis of Measurement: By the unit. When no quantity is provided, it is incidental to the cost of water service construction.
2. Basis of Payment: Includes curb stop, curb box and cover, fittings, and accessories.

1.3 REFERENCES

A. Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

B. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

C. American Society of Mechanical Engineers:
   1. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
   2. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

D. American Water Works Association:
   1. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
   2. AWWA C700 - Cold-Water Meters - Displacement Type, Bronze Main Case.
   3. AWWA C701 - Cold-Water Meters - Turbine Type, for Customer Service.
   4. AWWA C702 - Cold-Water Meters - Compound Type.
   5. AWWA C706 - Direct-Reading, Remote-Registration Systems for Cold-Water Meters.
   6. AWWA C800 - Underground Service Line Valves and Fittings.
   7. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, 1/2 in. through 3 in., for Water Service.
   8. AWWA M6 - Water Meters - Selection, Installation, Testing, and Maintenance.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on pipe materials, pipe fittings, corporation stop assemblies, curb stop assemblies, service saddles, and accessories.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of piping mains, curb stops, connections, thrust restraints, and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, except as modified in this section.

B. Wisconsin Administrative Plumbing Code, as administered by the Department of Commerce, shall govern the installation of water services, except as modified in this section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. During loading, transporting, and unloading of materials and products, exercise care to prevent any damage.

C. Store products and materials off ground and under protective coverings and custody, away from walls and in manner to keep these clean and in good condition until used.

D. Exercise care in handling precast concrete products to avoid chipping, cracking, and breakage.

PART 2 PRODUCTS

2.1 WATER PIPING AND FITTINGS

A. Water service lines shall be 1 inch, type K copper tubing unless otherwise shown on the plans.

B. Water service material shall be as indicated on the engineering drawings or bid form.

C. All water service fittings shall meet the requirements of NSF/ANSI 61 and NSF/ANSI 372 for lead free fittings.

D. Water services shall comply with Chapter 8.24.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, with tracer wire installed along PE service laterals as specified in Chapter 2.11.0.

E. Copper Tubing: ASTM B88, Type K, seamless copper tubing, annealed:
   1. Fittings: ASME B16.18, cast copper, or ASME B16.22, wrought copper. All water service fittings shall be compression type fittings. Flared fittings shall not be allowed.
   2. Joints: Compression connection.

F. High Density Polyethylene (HDPE): SDR 9 copper tube size, 200 psi
   1. Fittings: copper compression fitting stiffeners.

2.2 CORPORATION STOP ASSEMBLY

A. Corporation stops shall comply with Chapter 8.30.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

B. Manufacturers:
   1. Mueller Company: Model H-15008.

C. Corporation Stops:
   1. Brass or red brass alloy body conforming to ASTM B62.
   2. Inlet end threaded for tapping according to AWWA C800.
   3. Outlet end suitable for service pipe specified.

D. Service Saddles:
   1. Double strap type, designed to hold pressures in excess pipe working pressure.

2.3 CURB STOP ASSEMBLY

A. Curb Valves shall comply with Chapter 8.31.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

B. Service boxes shall comply with Chapter 8.25.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

C. Manufacturers: Shall match municipal standard.
   1. Brigham and Taylor 4901-R with stationary rod, ring and pin, size 94-F with service box extension as needed. Lid shall be marked "Water".

D. Curb Stops:
   1. Brass or red brass alloy body conforming to ASTM B62.
   2. Plug type valve.
   3. Positive pressure sealing.

E. Curb Boxes and Covers:
   1. Bingham & Taylor Buffalo 4901-R with stationary rod, ring and pin, size 94-F with service extension box as needed.
   2. Lid with inscription WATER, with Pentagon Plug.

2.4 UNDERGROUND PIPE MARKERS

A. Trace Wire: Tracer wire shall be ten (10) gauge (AWG) single strand copper wire with 60 mil of black, cross-linked polyethylene (XLPE) insulation specifically manufactured for direct burial applications. Tracer wire shall be blue for water services.

2.5 BEDDING AND COVER MATERIALS

A. Bedding: Type 3 Embedment as specified in Section 31 23 17.

B. Cover: Type 3 Embedment as specified in Section 31 23 17.

C. Soil Backfill from Above Pipe to Finish Grade: Native backfill as specified in Section 31 05 13. Subsoil with no rocks over 6 inches in diameter, frozen earth or foreign matter.

2.6 ACCESSORIES

A. Concrete for Thrust Restraints: high early strength concrete or solid concrete blocks. Wood blocking is not allowed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify building service connection and municipal utility water main size, location, and invert are as indicated on Drawings.

C. Contractor shall be responsible for identifying and reconnecting all existing water laterals to the new water main. Laterals are to be replaced from the new main to just beyond the existing curb stop or as directed by the Engineer.

3.2 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends to full pipe diameter, remove burrs.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.3 INSTALLATION - CORPORATION STOP ASSEMBLY

A. Make connection for each different kind of water main using suitable materials, equipment and methods approved by the Engineer.

B. Provide service clamps for mains other than of cast iron or ductile iron mains.

C. Screw corporation stops directly into tapped and threaded iron main at 10 and 2 o'clock position on main's circumference; locate corporation stops at least 12 inches apart longitudinally and staggered.

D. For plastic pipe water mains, provide full support for service clamp for full circumference of pipe, with minimum 2 inches width of bearing area; exercise care against crushing or causing other damage to water mains at time of tapping or installing service clamp or corporation stop.

E. Use proper seals or other devices so no leaks are left in water mains at points of tapping; do not backfill and cover service connection until approved by the Engineer.

3.4 BEDDING

A. Excavate pipe trench in accordance with Section 31 23 17 for Work of this Section.

B. Place bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.

C. Backfill around sides and to top of pipe in accordance with Section 31 23 17.

D. Maintain optimum moisture content of fill material to attain required compaction density.

3.5 INSTALLATION - PIPE AND FITTINGS

A. Maintain separation of water main from sewer piping in accordance with NR811 code.

B. Group piping with other site piping work whenever practical.

C. Install piping with minimum cover of 6-1/2 feet below finished grade unless otherwise indicated.

D. Contractor shall be equipped with varying types and sizes of fittings to accommodate the types of connections that may be required due to varying existing conditions.

E. Contractor shall coordinate with City Water Department for operation of existing valves and hydrants.

3.6 INSTALLATION - CURB STOP ASSEMBLY

A. Place curb stop and box on a concrete brick or block. Wrap bottom of curb box with polyethylene wrap. Center and plumb curb box over curb stops. Set box cover flush with finished grade.

B. Curb boxes shall have a minimum length of 7 feet when extended without the use of extension section.

3.7 INSTALLATION – PIPE MARKERS

A. When not connecting to an existing lateral, lateral ends shall be marked with a 6-foot steel fence post with 1-foot of the post below the end of the service. A 6-foot tall 4x4 treated wood post shall also be installed at the end of the service with 3-feet of the post being buried below grade. The exposed portion of the post shall be painted blue.

B. Tracer Wire
   1. Install tracer wire on all HDPE services.
   2. Tracer wire shall be laid flat and shall be securely fastened to the pipe at ten-foot intervals. The wire shall be protected from damage during installation and backfilling. The tracer wire shall be extended out the length of the service line and brought up in the curb box.

3.8 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.9 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Tests Required: The Contractor shall conduct hydrostatic pressure and leakage tests under the supervision of the Owner or Engineer. Slip joint ductile iron water main shall be tested for electrical conductivity in a manner approved by the Engineer. The Contractor shall furnish all equipment and labor for the tests.

C. Pressure test system in accordance with AWWA C600 and the following:
   1. Test Pressure: Not less than 150 psi or 50 psi in excess of maximum static pressure, whichever is greater.
   2. Test pressure shall not exceed pipe or thrust-restraint design pressures.

3. Conduct hydrostatic test for at least two-hour duration.
4. Each valved section of pipe shall be slowly filled with water, and the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) shall be applied by means of a pump connected to the pipe. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
5. Air Removal: Before applying the specified test pressure, air shall be expelled completely from the section of piping under test.
   Examination: : All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until satisfactory results are obtained.
6. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
7. Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
8. Compute maximum allowable leakage by the following formula:

| |
|---|
| $L = (SD\sqrt{P})/C$ |
| L = testing allowance, in gallons per hour |
| S = length of pipe tested, in feet |
| D = nominal diameter of pipe, in inches |
| P = average test pressure during hydrostatic test, in psig |
| C = 148,000 |
| When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size. |

9. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

END OF SECTION

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SECTION 33 12 16

WATER UTILITY DISTRIBUTION VALVES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Cut-In Valves.
2. Valve boxes.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 33 11 16 - Site Water Utility Distribution Piping.
3. Section 33 12 13 - Water Service Connections.
4. Section 33 12 19 - Water Utility Distribution Fire Hydrants.
5. Section 33 13 00 - Disinfecting of Water Utility Distribution.

C. Valves:
1. Basis of Measurement: Each.
2. Basis of Payment: Includes excavation, valve, valve box, pipe, fittings, accessories, tests, backfill and any other necessary items to complete the work. Adjustment of water valve boxes to finish grade shall be incidental to valve installation.

1.2 REFERENCES

A. American Water Works Association:
1. AWWA C500 - Metal-Seated Gate Valves for Water Supply Service.
2. AWWA C509 - Resilient-Seated Gate Valves for Water-Supply Service.
3. AWWA C550 - Protecting Epoxy Interior Coating for Valves and Hydrants.
4. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

B. National Sanitation Foundation:
1. NSF 61 - Drinking Water System Components - Health Effects

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawing:
1. Installation Plan: Submit description of proposed installation.

C. Design Data: Submit manufacturer's latest published literature include illustrations, installation instructions, maintenance instructions and parts lists.

D. Manufacturer's Certificates: Submit Statement of Compliance, supporting data, from material suppliers attesting that valves and accessories provided meet or exceed AWWA Standards and specification requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of valves.

C. Provide Operation and Maintenance Data for valves.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction standard.

B. Comply with requirements of local water utility.

1.6 QUALIFICATIONS

A. Manufacturer: company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years experience.

1.7 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing and protecting products.

B. Prepare valves and accessories for shipment according to AWWA Standards and seal valve and ends to prevent entry of foreign matter into product body.

C. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.9 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate work with State of Wisconsin standards and utilities within construction area.

PART 2 PRODUCTS

2.1 RESILIENT WEDGE GATE VALVES

A. Gate valves shall conform to Chapter 8.27.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

B. All fittings shall be compression type.

C. Valves shall be resilient wedge, Mueller A 2360 20 R.S or American Flow Control Series 2500 R.S.

D. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements Not Permitted.

2.2 VALVE BOXES

A. Valve boxes shall be three piece cast iron, screw type, 5 ¼ inch shaft with non-tip cover marked "WATER", Tyler 6860, or equal.

B. Valve boxes shall conform to Chapter 8.29.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition, specified for 7.5-foot bury (or as required for varying depths), and include valve box adaptor, Adaptor, Inc. or equal.

C. Castings shall be thoroughly coated with a 1 mil minimum thickness bituminous coating.

D. Cast iron lid, marked "Water".

2.3 ACCESSORIES

A. Concrete for Thrust Restraints: Concrete type specified in Section 03 30 00. Valves shall be placed on a solid concrete block (8"x8"x16").

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Determine exact location and size of valves from Drawings; obtain clarification and directions from Engineer prior to execution of work.

C. Verify invert elevations of existing work prior to excavation and installation of valves.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum locations.

B. Locate, identify, and protect utilities to remain from damage.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.
   1. Notify Engineer and Owner not less than 2 days in advance of proposed utility interruption.
   2. Do not proceed without written permission from the Engineer.

D. Perform trench excavation, backfilling and compaction in accordance with Section 31 23 17.

3.3 INSTALLATION

A. Install valves in conjunction with pipe laying; set valves plumb.

B. Provide buried valves with valve boxes installed at ¼" to ½" below finished pavement elevations.

C. Curb stops shall be located approximately mid-way between the curb and gutter unless otherwise requested by ENGINEEER in the field. Avoid installing curb stops/curb box near gas mains.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements : Field inspecting, testing, adjusting, and balancing.

B. Pressure test system in accordance with AWWA C600 and the following:
   1. Test Pressure: Not less than 150 psi or 50 psi in excess of maximum static pressure, whichever is greater.
   2. Test pressure shall not exceed pipe or thrust-restraint design pressures.
   3. Conduct hydrostatic test for at least two-hour duration.
   4. Each valved section of pipe shall be slowly filled with water, and the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) shall be applied by means of a pump connected to the pipe. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
   5. Air Removal: Before applying the specified test pressure, air shall be expelled completely from the section of piping under test.
      Examination: All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until satisfactory results are obtained.

6. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
7. Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
8. Compute maximum allowable leakage by the following formula:

| |
|---|
| $L = (SD\sqrt{P})/C$ |
| L = testing allowance, in gallons per hour |
| S = length of pipe tested, in feet |
| D = nominal diameter of pipe, in inches |
| P = average test pressure during hydrostatic test, in psig |
| C = 148,000 |
| When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size. |

9. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

END OF SECTION

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SECTION 33 12 19

WATER UTILITY DISTRIBUTION FIRE HYDRANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Fire hydrants.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 33 12 13 - Water Service Connections.
3. Section 33 12 16 - Water Utility Distribution Valves.
4. Section 33 13 00 - Disinfecting of Water Utility Distribution.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Fire Hydrants:
1. Basis of Measurement: Each.
2. Basis of Payment: Includes excavation, fire hydrant, accessories, test and backfill.

1.3 REFERENCES

A. American Water Works Association:
1. AWWA C502 - Dry-Barrel Fire Hydrants.
2. AWWA C550 - Protecting Epoxy Interior Coating for Valves and Hydrants.
3. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.

B. National Sanitation Foundation:
1. NSF 61 - Drinking Water System Components - Health Effects.

C. National Fire Protection Association:
1. NFPA 281 - Recommended Practice for Fire Flow Testing and Marking of Hydrants.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawing:
1. Installation Plan: Submit description of proposed installation.

C. Design Data: Submit manufacturer's latest published literature. Include illustrations, installation instructions, maintenance instructions and parts lists.

D. Manufacturer's Certificates: Submit Statement of Compliance, supporting data, from material suppliers attesting that hydrants and accessories provided meet or exceed AWWA Standards and specification requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of fire hydrants.

C. Provide Operation and Maintenance Data for fire hydrants.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction.

B. Perform work in accordance with AWWA C502.

C. Comply with requirements of local water utility.

D. Maintain one copy copies of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience approved by manufacturer.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation Meeting.

1.9 DELIVERY, STORAGE AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing and protecting products.

B. Prepare hydrants and accessories for shipment according to AWWA Standards and seal hydrant and ends to prevent entry of foreign matter into product body.

C. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

1.11 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate work with local municipality's standards and utilities within construction area.

PART 2 PRODUCTS

2.1 FIRE HYDRANTS

A. Fire Hydrants shall conform to Chapter 8.26.0 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Sixth Edition.

B. Hydrants shall have a 5 ¼" valve opening with two 2 ½" nozzle openings and one 4 ½" pumper nozzle with caps and chains. Hydrants shall be for 7.5' bury, and have a ground line breakable flange. New hydrants shall be equipped with a flex-stake (4" orange) hydrant marker.

C. Fire hydrants shall be furnished with FlexStake 800 Series Marker flags. Marker shall be red in color and 48-inches in length.

D. Manufacturers:
   1. Waterous Pacer WB 67.
   2. Substitutions: Section 01 60 00 - Product Requirements Not Permitted.

2.2 ACCESSORIES

A. Fire hydrants shall be furnished with FlexStake 800 Series Marker flags. Marker shall be red in color and 48-inches in length.

B. Concrete for Thrust Restraints: Concrete type specified in Section 03 30 00.

C. Aggregate: Aggregate for hydrant drainage specified in Section 31 05 16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Determine exact location and size of hydrants from Drawings; obtain clarification and directions from Architect/Engineer prior to execution of work.

C. Verify invert elevations of existing work prior to excavation and installation of fire hydrants.

3.2 PREPARATION

A. Identify required lines, levels, contours and datum locations.

B. Locate, identify, and protect utilities to remain from damage.

C. Do not interrupt existing utilities without permission and without making arrangements to provide temporary utility services.
   1. Notify Engineer not less than two days in advance of proposed utility interruption.
   2. Do not proceed without written permission from the Engineer.

D. Perform trench excavation, backfilling and compaction in accordance with Section 31 23 17.

3.3 INSTALLATION

A. Install fire hydrants; provide support blocking and drainage gravel; do not block drain hole.

B. Hydrants shall be restrained to tee with concrete buttresses and lugged retainer glands.

C. Set hydrants plumb with pumper nozzle facing roadway; set hydrants with centerline of pumper nozzle 18 inches above finished grade and safety flange not more than 6 inches nor less than 2 inches above grade.

D. For fittings, hydrants, valves and shortened pipe sections where cable bond type or copper conductivity type continuity devices are not provided by the manufacturer the Contractor shall field weld a lug onto the fitting, hydrant, valve or shortened pipe section and shall field install a strip or cable capable of carrying 500 amperes continuously between the sections. Cable bonds or copper conductivity strips may be installed around such fittings, valves or shortened pipe sections; but hydrants shall be equipped with continuity devices.

E. Hydrant color shall be Red, original manufacturer enamel coating.

F. Hydrant shall be set on a 12"x16"x8" solid concrete block. One-half (1/2) cubic yard of crushed stone shall be placed around the hydrant and a 6-mil poly shall be placed over the crushed stone as shown on the details. Hydrants shall be solidly buttressed against the trench wall.

G. After hydrostatic testing, flush hydrants and check for proper drainage.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush and disinfect system in accordance with Section 33 13 00.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Pressure test system in accordance with AWWA C600 and the following:
   1. Test Pressure: Not less than 150 psi or 50 psi in excess of maximum static pressure, whichever is greater.
   2. Test pressure shall not exceed pipe or thrust-restraint design pressures.
   3. Conduct hydrostatic test for at least two-hour duration.
   4. Each valved section of pipe shall be slowly filled with water, and the specified test pressure (based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge) shall be applied by means of a pump connected to the pipe. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. It is good practice to allow the system to stabilize at the test pressure before conducting the leakage test.
   5. Air Removal: Before applying the specified test pressure, air shall be expelled completely from the section of piping under test.
      Examination: : All exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the test. Any damage or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure test shall be repaired or replaced with sound material, and the test shall be repeated until satisfactory results are obtained.
   6. Correct visible deficiencies and continue testing at same test pressure for additional 2 hours to determine leakage rate. Maintain pressure within plus or minus 5.0 psig of test pressure. Leakage is defined as quantity of water supplied to piping necessary to maintain test pressure during period of test.
   7. Leakage Defined: Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe or any valved section thereof to maintain pressure within 5 psi of the specified test pressure after the pipe has been filled with water and the air has been expelled. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
   8. Compute maximum allowable leakage by the following formula:

| |
|---|
| L = (SD\/¯P)/C |
| L = testing allowance, in gallons per hour |
| S = length of pipe tested, in feet |
| D = nominal diameter of pipe, in inches |
| P = average test pressure during hydrostatic test, in psig |
| C = 148,000 |
| When pipe under test contains sections of various diameters, calculate allowable leakage from sum of computed leakage for each size. |

   9. When test of pipe indicates leakage greater than allowed, locate source of leakage, make corrections and retest until leakage is within allowable limits. Correct visible leaks regardless of quantity of leakage.

END OF SECTION

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SECTION 33 31 13

PUBLIC SANITARY UTILITY SEWERAGE PIPING

PART 2 GENERAL

2.1 SUMMARY

B. Section Includes:
1. Sanitary sewer pipe and fittings.
2. Underground pipe markers.
3. Connection to existing manholes.
4. Manholes.
5. Wye branches and tees.
6. Sanitary Laterals.
7. Bedding and cover materials.
8. Abandon Existing Sanitary Sewer

C. Related Sections:
1. Section 03 20 00 - Concrete Reinforcing.
2. Section 03 30 00 - Cast-In-Place Concrete: Concrete type for manhole base pad construction.
3. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
4. Section 31 23 16 -Earthwork: Product and execution requirements for excavation and backfill required by this section.
5. Section 31 23 17 – Trenching and Backfilling: Execution requirements for trenching required by this section.
6. Section 33 01 32 - Sewer and Manhole Testing.: Pressure, infiltration, and deflection tests.
7. Section 33 05 14 - Public Manholes and Structures: Concrete manholes, frames and grates for sanitary sewer.

2.2 UNIT PRICE - MEASUREMENT AND PAYMENT

B. Pipe and Fittings:
1. Basis of Measurement: By the linear foot for each size of pipe.
2. Basis of Payment: Includes hand trimming excavation, bedding, pipe and fittings, to indicated depth feet and connection to existing sewer.

Sanitary wyes, fittings, tracer wire, tracer wire access boxes and 4"x4" wood posts should be considered incidental to the construction of PVC lateral pipe of the size specified.

Connection to the existing sewers and manholes shall be incidental to sanitary sewer construction.

C. Manholes:
1. Basis of Measurement: By the each.

2. Basis of Payment: Includes hand trimming excavating, foundation pad, unit installation with accessories, connection to sewer piping.

D. Abandon Existing Sanitary Mains & Manholes:
1. Basis of Measurement: By Lump Sum if indicated on the bid form.
2. Basis of Payment: Shall be full compensation for furnishing all materials, for excavation and backfilling when necessary, for removal and off-site disposal, and for all labor, tools, equipment and incidentals necessary to complete the work.

If no price is stated in the Bid Form, abandoning existing mains & manholes shall be considered incidental to new main and manhole construction

2.3 REFERENCES

B. American Association of State Highway and Transportation Officials:
1. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

C. ASTM International:
1. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
4. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
5. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
6. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
7. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
8. ASTM C923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals.
9. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
10. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
11. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
12. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
13. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
14. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
15. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

16. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
17. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
18. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
19. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
20. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
21. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

D. American Water Works Association:
1. AWWA C104 - American National Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. through 48 in. (75 mm through 1200 mm), for Water and Other Liquids.
4. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C150 - ANSI Standard for the Thickness Design of Ductile Iron Pipe.
6. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
7. AWWA C153 - American National Standard for Ductile-Iron Compact Fittings for Water Service.

E. National Fire Protection Association:
1. NFPA 24 - Installation of Private Fire Service Mains and Their Appurtenances.

2.4 SUBMITTALS

B. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

C. Product data and shop drawings: Submit catalog cuts and other pertinent data indicating proposed materials, accessories, details, and construction information.

D. Submit reports indicating field tests made and results obtained.

E. Manufacturer's Installation Instructions:
1. Indicate special procedures required to install Products specified.
2. Submit detailed description of procedures for connecting new sewer to existing sewer line and directional drilling pipe jacking installation.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

2.5 CLOSEOUT SUBMITTALS

B. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

C. Project Record Documents: Record location of pipe runs, connections, manholes, cleanouts, and invert elevations.

D. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

2.6 QUALITY ASSURANCE

B. Perform Work in accordance with State of Wisconsin Standard Specifications for Sewer and Water Construction standard.

C. Sanitary laterals shall be installed in conformance with the Department of Commerce Plumbing Code and any local plumbing codes and regulations.

2.7 QUALIFICATIONS

B. Manufacturer: Company specializing in manufacturing Products specified in this section.

C. Installer: Company specializing in performing work of this section.

2.8 PRE-INSTALLATION MEETINGS

B. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

2.9 DELIVERY, STORAGE, AND HANDLING

B. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

C. Deliver and store valves in shipping containers with labeling in place.

D. Block individual and stockpiled pipe lengths to prevent moving.

2.10 FIELD MEASUREMENTS

B. Verify field measurements and elevations are as indicated.

2.11 COORDINATION

B. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

C. Coordinate the Work with Municipality of authority having jurisdiction.

D. Notify affected utility companies minimum of 72 hours prior to construction.

PART 3 PRODUCTS

3.1 SANITARY SEWER PIPE AND FITTINGS

B. Plastic Pipe: ASTM D3034, SDR 35, Poly (Vinyl Chloride) (PVC) material; inside nominal diameter of inches, bell and spigot style rubber ring sealed gasket joint.
   1. Fittings: PVC.
   2. Joints: ASTM F477, elastomeric gaskets.

3.2 FLEXIBLE COUPLINGS

B. Manufacturers:
   1. Fernco.
   2. Substitutions: Section 01 60 00 - Product Requirements.

C. Flexible Coupling: Resilient chemical-resistant elastomeric polyvinyl chloride (PVC) coupling, two Series 300 stainless steel clamps and stainless steel screws and housings.

3.3 FLEXIBLE PIPE BOOT FOR MANHOLE PIPE ENTRANCES

B. Manufacturers:
   1. Lock Joint Flexible Manhole Sleeve, Inc. Model.
   2. Substitutions: Section 01 60 00 - Product Requirements.

C. Flexible Pipe Boot: ASTM C923, ethylene propylene rubber (EPDM), Series 300 stainless steel clamp and stainless steel hardware.

3.4 MANHOLES

B. Manholes: As specified in Section 33 05 14; precast concrete, 48 inch diameter, eccentric conical top, water tight cast iron frames and covers.

3.5 BEDDING AND COVER MATERIALS

A. Bedding and Cover: Class C bedding as specified in Section 31 23 17 and as shown in the detail.

B. Soil Backfill from Above Pipe to Finish Grade: Native backfill or select granular backfill as specified in Section 31 23 17. Subsoil with no rocks over 6 inches in diameter, frozen earth or foreign matter.

3.6 ACCESSORIES

B. Grout: Specified in Section 03 60 00. 04 05 03.

C. Cellular concrete shall meet the following specifications: 1 part cement, 1 part fly ash, and 8 parts sand or an approved equal and water. Cement shall meet the requirements of Subsection 501.3.2 of the Standard Specifications for Type 1 Portland Cement. Sand

shall meet the requirements of Subsection 501.3.6.3 of the Standard Specifications. Water shall meet the requirements of Subsection of 501.3.5 of the Standard Specifications.

PART 4 EXECUTION

4.1 EXAMINATION

B. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

C. Verify trench cut excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

4.2 PREPARATION

B. Correct over excavation with coarse aggregate.

C. Remove large stones or other hard matter capable of damaging pipe or impeding consistent backfilling or compaction.

D. Protect and support existing sewer lines, utilities and appurtenances.

E. Maintain profiles of utilities. Coordinate with other utilities to eliminate interference. Notify Engineer where crossing conflicts occur.

4.3 BEDDING

B. Excavate pipe trench in accordance with Section 31 23 17.

C. Excavate to lines and grades shown on Drawings or required to accommodate installation of encasement.

D. Dewater excavations to maintain dry conditions and preserve final grades at bottom of excavation.

E. Provide sheeting and shoring in accordance with Section 31 23 17.

F. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.

4.4 INSTALLATION - PIPE

B. Install pipe, fittings, and accessories in accordance with ASTM D2321. Seal joints watertight.

C. Lay pipe to slope gradients noted on layout drawings. Begin at downstream end and progress upstream.

D. Assemble and handle pipe in accordance with manufacturer's instructions except as modified on the Drawings or by Architect/Engineer.

E. Keep pipe and fittings clean until work is completed and accepted by Architect/Engineer. Cap open ends during periods of work stoppage.

F. Lay bell and spigot pipe with bells upstream.

G. Connect pipe to existing sewer system as noted. Connecting to existing sewer shall be incidental to new main unless otherwise indicated on the bid form.

H. When replacing existing sewer, the existing sanitary sewer shall be excavated and removed as construction occurs. The new sewer shall be connected to the existing sewer at the end of each workday. Raw sewage shall not be allowed to run into the trench. Pumping sewage between manholes will be required.

I. Install trace wire continuous over top of pipe when shown on the plans or bid form.

4.5 INSTALLATION - CONNECTION TO EXISTING MANHOLE

B. Core drill existing manhole to clean opening. Using pneumatic hammers, chipping guns, sledge hammers, is not permitted.

C. Connection to existing manholes shall be made with a watertight KOR-N-SEAL boot.

D. Prevent construction debris from entering existing sewer line when making connection.

4.6 INSTALLATION - MANHOLES

B. Install manholes in accordance with Section 33 05 14.

4.7 INSTALLATION - WYE BRANCHES AND TEES

B. Install wye branches or pipe tees at locations indicated on Drawings concurrent with pipe laying operations. Use standard fittings of same material and joint type as sewer main.

C. Maintain minimum 5 feet separation distance between wye connection and manhole.

D. Use saddle wye or tee with stainless steel clamps for taps into existing piping. Mount saddles with solvent cement or gasket and secure with metal bands. Layout holes with template and cut holes with mechanical cutter. Clamp on wye branches shall not be permitted.

4.8 INSTALLATION - SANITARY LATERALS

B. Construct laterals from wye branch to terminal point at right-of-way or as shown on the plans or as directed by the Engineer.

C. Where depth of main pipeline warrants, construct riser type laterals from wye branch.

D. Maintain 8 feet minimum depth of cover over pipe unless connecting to existing laterals with less cover.

E. Maintain minimum 5 feet separation distance between laterals.

F. Lateral cards provided by Engineer must be completed by Contractor for each lateral.

G. It is the responsibility of the Contractor to identify and reconnect all existing live laterals.

H. Sewer and water services may be placed in a common trench if installed concurrently. If not installed concurrently, a minimum 10-foot horizontal separation must be maintained between the sewer and water services.

I. The minimum size sewer service shall be 4-inches in diameter. Sewer service size and class shall be as specified in the Contract Documents.

J. The alignment of a sewer service shall be straight extending from the spur or socket of the main sewer in a direction at right angles to the main sewer to the lot line or as specified on the plans. When the sewer service cannot be constructed as noted above, the Contractor shall install a marker at the end of the sewer service and shall notify the Owner of this condition.

K. Sanitary sewer services shall have a slope of one-fourth inch per foot where possible. In no case shall the slope be less than one-eighth inch per foot. Between the lot line and the sewer main, or riser pipe, the sewer shall be laid at uniform slope not exceeding one-half inch per foot. Between the lot line and the building, the slope shall not exceed one-half inch per foot, except for a change in elevation, which shall be made by use of 45-degree fittings.

L. When not connecting to existing lateral, install watertight plug, braced to withstand pipeline test pressure thrust, at termination of lateral.

M. All existing sewer services shall be reconnected with PVC SDR 35 pipe and a suitable Fernco coupling unless otherwise specified or directed by the Engineer.

N. Install tracer wire continuous over top of pipe when shown on the plans or bid form.

O. Contractor shall note the condition of the existing lateral beyond the reconnection point and notify the Engineer of the condition.

4.9 LOCATION OF EXISTING SEWER SERVICES

B. The Contractor will be furnished available recorded measurements for the location of existing sewer services. Evidence of existing trenches and any other pertinent evidence also shall be used in their location.

C. The Contractor is responsible for locating live laterals.

4.10 ABANDON EXISTING SANITARY MAINS & MANHOLES

B. All existing sewer mains shall be properly abandoned at all locations where the new sewer replaces the existing. The abandoned sewer pipe shall be plugged with cellular concrete in accordance with the pertinent requirements of Section 204 of the Wisconsin Department of Transportation Standard Specifications and as directed by the Engineer. The abandoned manholes shall have the walls removed at least 2 feet below subgrade within the roadbed and at least 2 feet below grade outside the roadbed. Fill remaining sections of manholes with acceptable fill material.

4.11 BACKFILLING

B. Backfill around sides and to top of pipe with cover fill in minimum lifts of 6 inches, tamp in place and compact to 95 percent. Place and compact material immediately adjacent to pipes to avoid damage to pipe and prevent pipe misalignment.

4.12 FIELD QUALITY CONTROL

B. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

C. Pressure Test: Test in accordance with Section 33 01 32.

D. Infiltration Test: Test in accordance with Section 33 01 32.

E. Deflection Test: Test in accordance with Section 33 01 32.

F. Compaction Testing: In accordance with ASTM D1557 AASHTO T180 ASTM D2922 ASTM D3017.

G. When tests indicate Work does not meet specified requirements, remove work, replace and retest.

H. Frequency of Compaction Tests: one test per 400 feet of trench per 2 foot lift.

4.13 PROTECTION OF FINISHED WORK

B. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

C. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

4.14 SCHEDULE

END OF SECTION

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SECTION 33 41 13

PUBLIC STORM UTILITY DRAINAGE PIPING

## PART 1 GENERAL

### 1.1 SUMMARY

A. Section Includes:
1. Storm drainage piping.
2. Accessories.
3. Drainage structures.
4. Bedding and cover materials.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Concrete type for catch basin manhole foundation slab construction.
2. Section 31 05 13 - Soils for Earthwork: Soils for backfill in trenches.
3. Section 31 23 16 - Excavation: Product and execution requirements for excavation and backfill required by this section.
4. Section 31 23 17 – Trenching and Backfilling: Execution requirements for trenching required by this section.
5. Section 31 23 19 - Dewatering
6. Section 33 05 14 - Public Manholes and Structures: Concrete manholes, frames and grates for storm drainage.

### 1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

A. Pipe and Fittings:
1. Basis of Measurement: By the linear foot for each pipe diameter and material including tapered ends edge of structure to edge of structure or end of pipe where applicable.
2. Basis of Payment: Includes excavating, bedding, pipe and accessories assembled, repair of damage, backfill and compacting the trenches, connecting to public storm sewer pipe, curb inlets or manholes and furnishing all materials including tools, equipment, labor, and incidentals necessary to complete the work in accordance with the Contract Documents.

   Connecting to the existing curb inlets or manholes shall be incidental to storm sewer construction.

B. Abandon Existing Storm Sewer:
1. Basis of Measurement: By Lump Sum when indicated on the bid form.
2. Basis of Payment: Abandon Existing Storm Sewer shall be payment in full for all excavation, removal, disposal, and backfill; and for furnishing of all labor, tools, equipment, and incidentals necessary to complete the work.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO M36/M36M - Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains.
   2. AASHTO M86 - Concrete, Sewer, Storm Drain, and Culvert Pipe.
   3. AASHTO M170 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
   4. AASHTO M196/M196M - Corrugated Aluminum Pipe for Sewers and Drains.
   5. AASHTO M198 - Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets.
   6. AASHTO M206 - Reinforced Concrete Arch Culvert Storm Drain, and Sewer Pipe.
   7. AASHTO M207 - Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe.
   8. AASHTO M252 - Corrugated Polyethylene Drainage Tubing.
   9. AASHTO M264 - Acrylonitrile-Butadiene-Styrene (ABS) and Poly Vinyl Chloride (PVC) Composite Sewer Piping.
   10. AASHTO M278 - Class PS 50 Polyvinyl Chloride (PVC) Pipe.
   11. AASHTO M288 - Geotextiles.
   12. AASHTO M294 - Corrugated Polyethylene Pipe, 12- to 36-in Diameter.

B. ASTM International:
   1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   2. ASTM A746 - Standard Specification for Ductile Iron Gravity Sewer Pipe.
   3. ASTM C14 - Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
   4. ASTM C76 - Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
   5. ASTM C443 - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
   6. ASTM C969 - Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.
   7. ASTM C924 - Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method.
   8. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)).
   9. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
   10. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
   11. ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
   12. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
   13. ASTM D2729 - Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
   14. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
   15. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
   16. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

17. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
18. ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
19. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
20. ASTM F405 - Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
21. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
22. ASTM F667 - Standard Specification for Large Diameter Corrugated Polyethylene Pipe and Fittings.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data indicating pipe and pipe accessories.

C. Manufacturer's Installation Instructions: Submit special procedures required to install Products specified.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents:
1. Accurately record actual locations of pipe runs, connections, manholes, inlets, catch basins, and invert elevations.
2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the State of Wisconsin, Department of Transportation, *Standard Specifications for Highway and Structure Construction*, latest Edition.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section.

B. Installer: Company specializing in performing work of this section.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Block individual and stockpiled pipe lengths to prevent moving.

C. Do not place pipe or pipe materials on private property or in areas obstructing pedestrian or vehicle traffic.

D. Do not place pipe flat on ground. Cradle to prevent point stress.

E. Store UV sensitive materials out of direct sunlight.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate the Work with termination of storm sewer, trenching, connection to public storm sewer and installation of storm sewer with others working in the area.

C. Coordinate unrecorded or variations in site conditions, and corresponding adjustments to construction requirements.

PART 2 PRODUCTS

2.1 STORM DRAINAGE PIPING

A. Storm piping material shall be as indicated on the engineering drawings or bid form.

B. Reinforced Concrete Pipe (RCP): ASTM C76, inside nominal diameter as shown on the plans, bell and spigot ends.
   1. Reinforced concrete pipe shall conform to Sections 608 and 610 of the Wisconsin Department of Transportation Standard Specifications.
   2. Class
      a. All 12" reinforced concrete pipe (RCP) shall be Class IV
      b. All 15" RCP shall be Class IV
      c. All 18" RCP or larger shall be Class III
   3. Fittings: Reinforced concrete.
   4. Joints: ASTM C443 rubber compression gasket.

2.2 DRAINAGE STRUCTURES

C. Drainage Structures: Precast concrete, as specified in Section 33 05 14.
   1. Manholes: Diameter as shown on the plans, water tight, cast iron covers.
   2. Inlets: Shall be Type 3 (2'x3') or concrete manholes as indicated on the plans, cast iron bicycle safe grate.

2.3 BEDDING AND COVER MATERIALS

A. Bedding: Class B as specified in Section 31 23 17 and as shown in the detail.

B. Cover: Class B as specified in Section 31 23 17 and as shown in the detail.

C. Soil Backfill from Above Pipe to Finish Grade: Native backfill or select granular backfill as specified in Section 31 23 17. Subsoil with no rocks over 6 inches in diameter, frozen earth or foreign matter.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings. Notify Engineer of discrepancies.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with coarse aggregate.

B. Remove large stones and other hard or organic matter capable of damaging piping or impeding consistent backfilling or compacting.

C. Protect and support existing sewer lines, utilities and appurtenances.

D. Maintain profiles of utilities. Coordinate with other utilities to eliminate interference. Notify Engineer where crossing conflicts occur.

3.3 EXCAVATION, BEDDING & BACKFILL

A. Excavate pipe trench in accordance with Section 31 23 17. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Backfill pipe trench in accordance with Section 31 23 17.

C. Dewater excavations to maintain dry conditions to preserve final grades at bottom of excavation.

D. Provide sheeting and shoring in accordance with Section 31 23 17.

E. Place bedding material at trench bottom, level materials in continuous layer not exceeding 6 inches compacted depth; compact to 95 percent.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with the following:

B. ASTM D2321 for HDPE and PVC pipe and the ACPA Concrete Pipe Handbook for Concrete pipe. Seal joints watertight.

C. Place pipe on minimum 6 inch deep bed of Class B bedding as specified in Section 31 23 17.

D. Install piping beginning at low point of systems, true to grades and alignment indicated on the drawings with unbroken continuity of invert. Connect pipe to drainage structures. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

E. Line and Grade: The Engineer will establish the centerline, manholes, inlets, and reference elevations at suitable intervals. The Contractor shall, at his own expense, furnish the necessary equipment and technical personnel to transfer the alignments and grades from stakes to the sewer location. The Contractor shall check the alignment and grade of the sewer at each staked station, or as directed by the Engineer. If it is determined that any or all sewer is not installed in conformance with the staked or plan alignments and grades, the Contractor shall make the necessary corrections at his expense. When a new sewer is to be connected to an existing sewer not terminating in a manhole, the Contractor shall uncover the end of the existing sewer to allow any adjustments in line and grade to be made before any pipe is laid. Install top cover to minimum compacted thickness of 12 inches. Compact to 95 percent dry density by weight.

F. Alignment: All pipe shall be laid uniformly to line and grade so that the finished sewer will present a uniform bore. Noticeable variations from true alignment and grade will be considered sufficient cause for rejection of the work. All pipe to be laid in open-cut trench shall have 7-inch minimum clearance between the outside face of the pipe barrel and the face of the trench wall or sheathing.

G. Protection of Open Pipe: During all intermissions in construction of the sewer, the open face of the last pipe laid shall be covered or bulkheaded so as to prevent sand, water, earth, or other materials from entering the pipe. Fences shall be provided around all opening trenches whenever required for protection from the public.

H. Provide joint ties on storm sewer system infall and outfall pipes. Tie the last 3 sections or, if using apron endwalls, the endwall and the last 2 sections. Ties are not required on installations with masonry endwalls unless the plans show otherwise.

I. Refer to Section 31 23 17 for backfilling and compacting requirements. Do not displace or damage pipe when compacting.

3.5 INSTALLATION - DRAINAGE STRUCTURES

A. Install catch basins, inlets, apron end walls, and manholes in accordance with Section 33 05 14.

3.6 CLOSING ABANDONED DRAINAGE SYSTEMS

A. Abandoned Piping: All existing sewer mains shall be properly abandoned at all locations where the new sewer replaces the existing. The abandoned sewer pipe shall be plugged with cellular concrete in accordance with the pertinent requirements of Section 204 of the Wisconsin Department of Transportation Standard Specifications and as directed by the engineer. The abandoned manholes shall have the walls removed at least 2 feet below subgrade within the roadbed and at least 2 feet below grade outside the roadbed. Fill remaining sections of manholes with acceptable fill material. Removed storm sewer shall be disposed of off site.

3.7 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Clear interior of piping of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
   1. In large, accessible piping, brushes and brooms may be used for cleaning.
   2. Place plug in end of incomplete piping at end of day and whenever work stops.
   3. Flush piping between manholes and other structures, if required.

C. Compaction Testing: In accordance with ASTM D1557 AASHTO T180 ASTM D2922 ASTM D3017.

D. When tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Compaction Tests: one test per 400 feet of trench per 2 foot lift.

3.8 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is complete.
   1. Take care not to damage or displace installed pipe and joints during construction of pipe supports, backfilling, testing, and other operations.
   2. Repair or replace pipe that is damaged or displaced from construction operations.

END OF SECTION

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