



Village of Buffalo Grove

VILLAGE OF BUFFALO GROVE
CHATHAM LIFT STATION RECONSTRUCTION

VoBG-2020-03

February 2020

BIDDING AND CONTRACT DOCUMENTS

Village of Buffalo Grove
Public Works Department



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**ADVERTISEMENT FOR BIDS
SECTION 00 11 13**

The Village of Buffalo Grove, Cook County, Illinois will receive sealed bids at Village Hall located at 50 Raupp Boulevard, Buffalo Grove, Illinois 60089, until **Eleven O'clock (11:00) A.M. local time on the 27th day of February 2020**, for **CHATHAM LIFT STATION RECONSTRUCTION**. Said bids will be publicly opened and read aloud at that time.

The work includes the following items and work activities: Selective demolition of existing can-type pump station; Construction of new wet well with duplex submersible pump operation including new wet well top with access hatch; Dewatering; Installation of new submersible solids handling pumps with constant speed drives and controls; Associated electrical and instrumentation work; New valve / meter / bypass vault; New electrical service; New traffic box control panel; New diesel engine generator; Contractor bypass pumping as needed; Concrete generator and control panel pads; New asphalt driveway; Concrete restoration; Site grading and landscape restoration.

Contractor shall comply with the requirements of the Illinois Prevailing Wage Act (820 ILCS 130/0.01 et seq.).

The Contract Documents for the proposed improvements are on file with the Village of Buffalo Grove and are available on the Village's website.

The Village of Buffalo Grove reserves the right in receiving these bids to waive technicalities and reject any and all bids.

A mandatory pre-bid meeting will be held at the Public Works office (51 Raupp Boulevard, Buffalo Grove, IL 60089) at 10:00 a.m., February 19th, 2020.

Published by the order of the Village of Buffalo Grove, Illinois

**INSTRUCTIONS TO BIDDERS
SECTION 00 21 13**

1) OWNER AND ENGINEER

The Owner shall be the Village of Buffalo Grove

The Engineer shall be Ciorba Group.

2) GENERAL

To demonstrate qualification for performing the Work of this Contract, Bidders may be requested to submit written evidence of financial position, previous experience, and/or current commitments.

Bids will be based on a single lump-sum contract price. Escalation of Contract price will not be allowed. All prices quoted must represent the entire cost in accordance with the Contract Document and no subsequent claim will be recognized for any increase in wage scales, material prices, cost indexes, or other rates affecting the construction industry or this project. Project documents may be examined at the Owner's Office during normal office hours.

Do not separate this Document. Bid Proposals must be submitted in the form of the completely bound Contract Documents.

3) BID DUE DATE, TIME AND PLACE

Signed bids, under seal, executed and dated for furnishing all services, labor, equipment, materials, and performing all Work necessary for **Chatham Lift Station Reconstruction**, all in accordance with the Contract Documents, will be received from **Contractors** by the Owner located at **50 Raupp Boulevard, Buffalo Grove, Illinois 60089** on or before **11:00 a.m.** local time on the **27th day of February, 2020**.

Bids will be opened publicly and read aloud at the above address at 11:00 a.m. local time. No immediate decision will be rendered concerning the proposals submitted.

Bid offers submitted after the above bid opening due time will be returned to the Bidder unopened.

4) SUBMISSION OF BID

Bidders shall submit **one (1) original** and **one (1) copy** of their proposal, together with Bid Security, affidavit of non-collusion and all other documents bound herewith, including all Addenda issued, in sealed envelope addressed as follows:

**Village of Buffalo Grove
50 Raupp Boulevard
Buffalo Grove, IL 60089**

Subject: **Proposal for Chatham Lift Station Reconstruction – VoBG-2020-03**

In addition, the sealed envelope submitted by the Bidder shall include the following information on the envelope face: Bidders name and address, and the date and hour of bid opening as designated herein.

Where proposals are sent by mail, special messenger, courier service, etc. the Bidder shall be responsible for the delivery of the Bid as designated herein prior to the designated date and hour for the opening of the Bids. If delivery is delayed beyond the date and hour set for the bid opening, proposals thus delayed will not be considered and will be returned unopened to respective bidders.

5) PROJECT DESCRIPTION & SCHEDULE

The project generally consists of selective demolition of existing can-type pump station; Construction of new wet well with duplex submersible pump operation including new wet well top with access hatch; Dewatering; Installation of new submersible solids handling pumps with constant speed drives and controls; Associated electrical and instrumentation work; New valve / meter / bypass vault; New electrical service; New traffic box control panel; New diesel engine generator; Contractor bypass pumping as needed; Concrete generator and control panel pads; New asphalt driveway; Concrete restoration; Site grading and landscape restoration.

The location of the project is located on the north side of Weidner Road, east of Stradford Circle and north of Dundee Parkway in Buffalo Grove, IL 60089. The existing lift station is located on Village property adjacent to the public right of way, in front of Lions Park.

Access to the project site during construction activities will be from Weidner Road via controlled construction access into contractor provided security fence enclosure.

Security Precautions. Contractor shall be responsible for any and all security precautions which may be required during the course of the Work.

Working Hours. The **Owner** will admit Contractors to the job site during working hours from 7:00 AM to 7:00 PM weekdays. No work will be allowed on Saturdays unless prior approval is granted in writing by the **Owner**. If work is allowed, it shall be confined to the period beginning at 8:00 AM to 7:00 PM. Any work outside the allowed time periods specified including but not limited to material deliveries, mobilization of equipment, warming up machinery, general deliveries and mobilization of equipment, may incur a penalty of \$1,000 for each occurrence.

Project Schedule. The Work of these Contract Documents is required to be totally completed within **two hundred thirty five (235) consecutive calendar days** after the **Notice to Proceed** is issued. The successful Bidder shall submit in writing, a construction schedule showing sequence of operations for review by the **Owner** prior to commencement of Work. **A preliminary schedule shall be submitted with the bid.**

6) LICENSE OR ROYALTY FEES.

If the Project is designed to require or permit use of processes, articles, apparatus or equipment for which licenses, or royalty fees will be charged, fees shall be paid directly by Contractor to patentee, licensee or owner of such processes, and fees shall be included in bid.

7) EXAMINATION BY BIDDER

The Bidder shall, before submitting his/her proposal, carefully examine the Contract Documents, proposal, and bond and insurance requirements. The Bidder shall inspect in detail the site of the proposed Work and familiarize themselves with the detailed requirements of all Work, and with all the local conditions affecting the Contract under which he/she will be obligated to operate in performing the Work. **It is a mandatory requirement that the Bidder visit and inspect the site of the proposed Work.** By submission of a bid it is understood that the Bidder has satisfied this mandatory requirement. If his/her Bid is acceptable, the Bidder shall be responsible for, and the **Owner** will make no allowance for, any errors in his/her proposal resulting from his/her failure or neglect to comply with these instructions.

8) SUBSURFACE EXPLORATION

Notwithstanding anything in any Contract Document to the contrary, including the Standard General Conditions of Construction Document, as amended by Owner, the Contractor shall assume full responsibility for meeting and overcoming all soil conditions, including rock, isolated boulders, saturated soil, running sand or any other material he/she may encounter at his/her own expense.

9) INTERPRETATION OF CONTRACT DOCUMENTS

Questions regarding documents, discrepancies, omissions, or intent of the Specifications or Drawings shall be submitted in writing to **Ciorba Group** at least **seven calendar days** prior to opening of Bids to provide time for issuing and forwarding an Addendum. Any interpretation of the Contract Documents will be made only by Addendum duly issued or delivered by **Ciorba Group** to each person receiving a set of Contract Documents. **Ciorba Group** will not be responsible for any other explanations or interpretations of the Contract Documents. Failure on the part of the prospective Bidder to receive a written interpretation prior to the time of bid opening will not be grounds for withdrawal of his/her proposal. The Bidder shall acknowledge receipt of

each Addendum issued in the space so provided in the Bid Form. Oral explanations will not be binding.

Direct questions to Ciorba Group; Mr. Luke Mattson: 773-355-2947
lmattson@ciorba.com

All Bidders are prohibited from making any contact with the Village President, Trustees, or any other official or employee of the Village (collectively, "Municipal Personnel") with regard to the work, other than in the manner and to the person(s) designated herein. The Village Manager of Buffalo Grove reserves the right to disqualify any Bidder that is found to have contacted Municipal Personnel in any manner with regard to the work. Additionally, if the Buffalo Grove Village Manager determines that the contact with Municipal Personnel was in violation of any provision of 720 ILCS 5/33E, the matter will be turned over to the Cook County State's Attorney for review and prosecution.

10) APPROXIMATE QUANTITIES

On all items on which bids are to be received on a unit price basis the quantities stated in the Bid will not be used in establishing final payment due Contractor. The quantities stated, on which unit prices are invited, are approximate only. Bids will be compared on the basis of number of units stated in the Bidding Schedule. Payment on the Contract on unit price items will be based on the actual number of units installed (or otherwise performed) in the completed Work.

11) PREPARATION OF PROPOSAL

The Bidder shall prepare his/her proposal on the attached Bid Form. Unless otherwise stated, all blank spaces of the Bid Form must be correctly filled in. Entries must be stated for each and every item, either typed in or written in ink. Only Bids which are made out on the Bid Form included in this Document will be considered. Amounts are to be shown in both words and figures. In case of discrepancy between words and figures the words shall prevail, unless it clearly appears in **Owner's** opinion that the words rather than the figures are in error. If any portion of the Bid is required to be given in unit prices and totals, and a discrepancy exists between the unit prices and totals, the unit prices shall prevail, unless it clearly appears in **Owner's** opinion that the unit prices rather than the totals are in error. If a discrepancy exists between the total base bid and the true sum of the individual bid items, the true sum shall prevail. A bid will be rejected if it does not contain a price for each and every item named in the Bidding Schedule. Bidders are warned against making any erasures or alterations of any kind, and bids which contain omissions, erasures, conditions, alterations, or additions not called for may be rejected.

12) SIGNING OF BID

If the Bidder is a corporation, the legal name of the corporation shall be set forth together with the signature of the officer or officers authorized to sign contracts on

behalf of the corporation. If the Bidder is a co-partnership, the true name of the firm shall be set forth together with the signatures of all the partners. If the Bidder is an individual, his/her signature shall be inscribed. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a power of attorney must be on file with the Owner prior to bid opening or submitting bids; otherwise the Bid may be regarded as irregular and may be rejected.

13) BID SECURITY

Each Bid shall be accompanied by a bid bond, cashier's check or certified check drawn on a solvent bank in the **State of Illinois** payable without condition to the **Owner** in an amount not less than **five percent (5%)** of the Bidder's highest aggregate bid amount whether it be for the Base Bid or the Alternative Bid(s) (when Alternatives are requested), as a guarantee that the Bidder will within **fifteen (15) calendar days** after the date of the award of a contract execute an agreement and file bonds and insurance as required by the Contract Documents if his/her Bid is accepted. **Bids not accompanied by a bid security will not be considered.**

If an intended awardee fails to execute and file an agreement, bonds and insurance as required by the Contract Documents, the amount of the security submitted with his/her Bid shall be forfeited, not as a penalty, but as liquidated damages. No Bid will be considered unless accompanied by a Bid Security as a guarantee that if the Bid is accepted the Bidder will execute the Agreement and file bonds and insurance as required by the Contract Documents within **15 calendar days** from the date of the award of the Contract.

14) RETURN OF BID SECURITIES

The bid security of the three (3) lowest bidders will be retained until a contract has been entered into and executed with the successful bidder and the performance and labor and material payment bonds, each in the full amount of the Contract, have been posted with the **Owner** and Certificates of Insurance indemnifying and adding as Additional Insureds, the **Owner** and **Ciorba Group.**, and their officers, employees and agents, have been delivered to and reviewed by the Engineer. The cashier's checks or bank certified checks used as bid security of the other Bidders will be returned within **15 calendar days** after the opening of the Bids.

15) CONSIDERATION OF PROPOSALS

No proposal will be accepted from or Contract awarded to any person, firm or corporation that is in arrears or is in default to the **Owner** upon any debt or contract, or that is a defaulter, as surety or otherwise, upon any obligation to the **Owner**, or had failed to perform faithfully any previous contract with the **Owner**.

The **Owner** reserves the right to accept or reject any and all bids or any part thereof, to waive any informality or minor defects or irregularities in bidding, or accept the bid that, in its opinion, will serve its best interests or to decide not to award any contracts.

16) BID SUBMITTAL

Any bid may be withdrawn at any time prior to the hour herein stated for the bid opening, provided that a request in writing, executed by the Bidder, or his/her duly authorized representative, for the withdrawal of such Bid is filed with **Owner** prior to the time specified for opening of Bids. The withdrawal of a Bid will not prejudice the right of a Bidder to file a new Bid.

No Bidder shall withdraw, cancel or modify his/her proposal for a period of **ninety (90) consecutive calendar days** after the specified closing time for the receipt of proposals, nor shall the successful Bidder withdraw, cancel or modify his/her proposal after having been notified that said proposal has been accepted by the **Owner**.

Bidders shall guarantee their bids for a period of **ninety (90) consecutive calendar days** from the date of receipt of bids.

17) PENALTY FOR COLLUSION

If at any time it shall be found that the person, firm or corporation to whom the Contract has been awarded has, in presenting any Bid or Bids, colluded with any other party or parties, then the Contract so awarded shall be null and void, and Contractor and his/her sureties shall be liable to **Owner** for all loss or damage which **Owner** may suffer thereby, and **Owner** may advertise for new bids for said Work.

18) LICENSE AND EXPERIENCE

Each Bidder shall possess state and local licenses as are required by law, and shall furnish satisfactory proof to **Owner** upon request that the licenses are in effect during the entire period of the Contract.

To be considered as eligible to submit a proposal, a Bidder shall have complied with all legal requirements to permit him/her to operate under applicable laws of the **State of Illinois**.

The Contractor bidding the project shall be actively engaged in Work of the nature of the project described and have adequate specialized workers and machines to do the Work.

19) ACCEPTANCE/REJECTION OF BIDS

The **Owner** reserves the right to accept or reject any and all bids or any part thereof, to waive any informality or minor defects or irregularities in bidding, or accept the bid that, in its opinion, will serve its best interests or to decide not to award any contracts.

20) EFFECTIVE DATE OF AWARD

If a Contract is awarded by **Owner**, such award shall be effective when formal notice of such award, signed by the authorized representative of **Owner**, has been delivered to the Intended awardee, or mailed to him/her at the main business address shown on his/her Bid by an officer or agent of **Owner** duly authorized to give such notice.

21) EXECUTION OF AGREEMENT

Copies of the Agreement in the number stated in the Contract Agreement will be supplied by the **Owner** and shall be executed by the successful Bidder, and returned, together with the required bonds and insurance, within **fifteen (15) calendar days** from and after the date of the award of the Contract. Effective date of bonds shall be the same as the date of the Agreement.

22) FAILURE TO EXECUTE AGREEMENT AND FILE BOND & INSURANCE

Failure of a successful Bidder to execute the Agreement and file required bonds and insurance within the required time shall be just cause for the annulment of the award. On failure of a successful Bidder to execute the Agreement and file the required bonds and insurance within the required time, he/she shall forfeit his/her Bid Security as agreed hereinbefore. Upon annulment of an award as aforesaid, **Owner** may then re-award the Contract.

23) EXCEPTIONS

Any Bidder's exceptions to these terms or conditions or deviations from the written Specifications shall be shown in writing and attached to the Bid Form. However, such exceptions may be cause for rejection of the Bid.

24) SUBSTITUTE MATERIAL

Where in the Technical Specifications one or more certain equipment/materials, trade names or articles of certain manufacture are mentioned, it is done for the express purpose of establishing a basis of durability and efficiency and not for the purpose of limiting competition. Other names of equipment/material can be used if, in the opinion of the Engineer and the Owner, they are equal in durability and efficiency to those mentioned and of a design in harmony with the Work as outlined; and the Engineer and Owner give a written approval of a substitution. Adequacy of the proposed substituted equipment and/or materials shall be determined during the shop drawing review process. Any substituted materials and/or equipment ordered by the Contractor prior to the shop drawing review process shall be at the Contractor's own risk. Should a

substitution of equipment and/or materials be desired, the Contractor shall be required to request the change in writing within **ten (10) calendar days** from the award of the Contract.

25) GUARANTEE

The Contractor shall furnish satisfactory performance and maintenance bonds in the sum of the full amount of the Contract in dollars guaranteeing the proper completion of the Work and the maintenance of the Work during the period of one (1) year from and after the date of the completion and acceptance of the same. The maintenance, however, shall not include any damage to the Work or to any of the other obligations embraced by the Contractor which may be incurred by action beyond the control of the Contractor.

26) PERFORMANCE AND PAYMENT BONDS

The Contractor shall furnish Performance and Payment bonds in an amount at least equal to 100 percent of the aggregate amount of the Contract as security for the faithful performance of the Contract and for the payment of all persons performing labor and furnishing materials in connection with this Contract. The Performance and Payment Bonds must contain a provision that will guarantee payment in accordance with the Prevailing Wage Act.

27) (NOT USED)

28) PREVAILING WAGE RATES

Not less than a prevailing wage rate shall be paid for labor on the Work to be performed under this Contract, as required by law. The rates for various phases of Work contemplated shall be in accordance with the prevailing wage scale. The Contractor shall be required to comply with all applicable federal, state and local laws pertaining to employment. Illinois workers shall be employed to perform Work in accordance with the provisions of ILCS, Chapter 48, Section 2201 et seq. (1985). The Owner may at any time inquire of the Contractor as to the rates of wages being paid employees of the Contractor, any subcontractor or material men, where upon such information shall be promptly provided to the Owner. A certified payroll shall be submitted with each pay out request.

If at the time the Contract is executed, or if during the term of the Contract, there is excessive unemployment in Illinois as defined in the Employment of Illinois Workers on Public Works Act, 30 ILCS 570-0.01 et seq., as two consecutive months of unemployment exceeding 5%, the Contractor agrees to employ Illinois laborers as stipulated by the Act. An "Illinois laborer" is defined as any person who has resided in Illinois for at least thirty (30) calendar days and intends to become or remain an Illinois resident.

29) EQUAL EMPLOYMENT OPPORTUNITY CLAUSE

Each Bidder agrees as evidenced by his/her submission of a bid to comply with all terms of the Equal Employment Opportunity Clause of the Illinois Fair Employment Practices Commission: and to comply with all Illinois labor laws, particularly with regard to:

A. "Preference to Citizens Illinois on Public Works Projects Acts" (Illinois Compiled Statutes, Chapter 48, Section 289 - 275).

B. "Wages of Employees on Public Works" (Prevailing Wage Act) (Illinois Compiled Statutes, Chapter 48, Section 395-1-12).

The Contractor, in performing under the Contract, shall not discriminate against any worker, employee or applicant, or any member of the public because of race, creed, color, age, sex, sexual orientation or national origin, nor otherwise commit an unfair employment practice as defined in local, State, or Federal anti-discrimination and employment laws. The Contractor further agrees that this article will be incorporated by the Contractor in all contracts entered into with suppliers of materials or services, contractors and subcontractors and all labor organizations, furnishing skilled, unskilled and craft union skilled labor, or who may perform such labor or services in connection with this Contract.

30) TAXES

Federal Excise Tax does not apply to materials purchased by the **Owner** by virtue of its municipality status. The **Owner** is a not-for-profit agency which has a sales tax exemption status. Owner's Tax Exemption Number will be provided (if requested) to the successful Bidder upon execution of the Agreement. All savings resulting from the **Owner's** tax exempt status shall accrue to the **Owner**.

31) LIQUIDATED DAMAGES

Time is of the essence in completion of the Work. The **Owner** may collect liquidated damages in the daily amount of \$500 per calendar day should the Contractor fail to complete the authorized work within the time allowed for the Project Schedule. Contractor acknowledges that any delay in completion of the Work will adversely affect traffic, business, and other activities within the Village. Contractor and Owner agree that to avoid the time and expense required to litigate or otherwise dispute the fair value of the damages caused by delay in completing the Work, Owner will be entitled to liquidated damages set in this paragraph.

32) DEFINED TERMS

The terms "**Village**" or "**Village of Buffalo Grove**", "Proposal" and "Plans" mean the same as "OWNER", "BID", and "DRAWINGS" respectively. In these Contract

Documents, the Village of Buffalo Grove as Owner will execute the Contract Agreement and oversee the work to be performed as part of the Contract Agreement. However, the term "Owner" shall not mean to imply the ownership of all existing and proposed facilities identified in the scope of work for this Project.

Where **Owner's Representative** is referenced, such reference shall be understood to mean the Engineer (when appointed by the Owner), and/or any other individual(s) duly authorized by the **Owner** to act as the representative of the **Owner**.

Terms used in these Instructions to Bidders are defined in the Standard General Condition of the Construction Contract as prepared by Engineers Joint Contract Documents Committee and amended by **Owner**. Unless otherwise stated, these Standard General Conditions of the Construction Contract as amended, shall apply to the Work of this Contract; and shall be incorporated into this Contract as the General Conditions of the Contract all of which are as fully a part of this Contract as if herein set out verbatim, or if not attached, as if hereto attached.

--END OF SECTION--

**BID FORM
SECTION 00 41 43**

**TO: VILLAGE OF BUFFALO GROVE
50 RAUPP BOULEVARD
BUFFALO GROVE, IL 60089**

PROJECT: CHATHAM LIFT STATION RECONSTRUCTION

ACKNOWLEDGMENTS: The undersigned has received the Contract Documents entitled:

"Chatham Lift Station Reconstruction" and the following addenda to these documents:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

All provisions of the Contract Documents and the addenda have been included in the Proposal submitted by the undersigned. The undersigned has carefully examined all of the Contract Documents and the sites and submits the following Proposal:

AGREEMENT: In submitting this Proposal, the undersigned agrees and/or understands:

1. Bids are to be held for **a period up to 90 calendar days** after the bid opening, with a "Notice of Award" expected to be issued to the apparent successful bidder within that period.
2. The prices in this bid have been arrived at independently, without consultation, communication or agreement, as to any matter relating to such prices with any other bidder or with any competitor and this Bid is in all respects fair and without collusion or fraud. Unless otherwise required by law, the prices which have been quoted in this Bid have not been knowingly disclosed and will not knowingly be disclosed prior to opening directly or indirectly to any other bidder or to any competitor. No attempt has been made nor will be made by the undersigned to induce any other person or firm to submit or not to submit a Bid for the purpose of restricting competition.
3. To enter into and execute the Contract and furnish the properly executed bonds and insurance certificates within the time and with the forms and in the amounts required by the Contract Documents if the award is made to the undersigned.

4. To accomplish the Work strictly in accordance with the Contract Documents.
5. To complete all Work within **the time period as specified and** after Notice To Proceed is received. The Bidder, in submitting a bid offer, accepts the specified Contract Time for performing the Work. Completion of Work shall be in accordance with the time period as specified. Contractor shall submit with the Bid a copy of the proposed construction schedule. Contractor shall comply with the applicable requirements of Section 01 32 16 regarding the construction schedule.
6. The undersigned warrants that he/she has carefully examined the sites of the Work and all Contract Documents, that he/she is fully aware and knows of the character of the material, that he/she is fully satisfied as to the conditions to be encountered overhead, on the surface and in the spaces, and of the character, quality and quantities of Work to be performed and materials to be furnished, and the requirements of the Contract Documents. Furthermore, the undersigned has based the within Contract prices on his/her own independent examination in performing the Work and has not relied upon any information furnished to him/her by the **Owner**, any agent, servant or employee of the **Owner**. The undersigned agrees to assume all risks arising from any deficiencies in the Drawings, Specifications, or other Contract Documents and will make no claim against the **Owner** because of any such alleged deficiency or alleged breach of warranty by the **Owner**. The undersigned further assumes all risks of any unforeseen conditions to be incurred in performing the Work, either overhead, on the surface, or in spaces, and has taken these risks into consideration in preparing his/her Bid. The undersigned further warrants that he/she will perform such additional and/or corrective Work as may be required in order to insure that the Work performs its intended function satisfactorily, for the prices set forth in his/her proposal and at no additional cost to the **Owner**.
7. Before submitting this Proposal, the undersigned confirms that he/she has available the equipment, forces and materials necessary to perform the Work and made all necessary arrangements to insure that such equipment and materials be delivered to the site at such time as will enable him/her to perform all obligations of the Contract within the Construction Time herein stated. Furthermore, the undersigned also confirms that he/she has contacted the manufacturers and/or suppliers of the equipment and materials necessary to perform the Work and made all necessary arrangements to insure that such equipment and materials be delivered to the site at such time as will enable him/her to perform all obligations of the Contract within the Construction Time herein stated.
8. Accompanying this proposal is a Bid Security complying with the provisions herein stated.

9. If this proposal is accepted and the undersigned fails to execute a contract and provide the bonds and certificate of insurance, as required, it is hereby agreed that the Bid Security shall be forfeited to the **Owner**, not as a penalty, but as liquidated damages.
10. Each pay item listed in the Bidding Schedule and in the Schedule of Prices (Section 00 42 43) shall have a unit price or lump sum price and a total price.
11. The unit price shall govern if no total price is shown or if there is a discrepancy between the product of the unit price multiplied by the quantity.
12. If a unit price is omitted, the total price will be divided by the quantity in order to establish a unit price.
13. A bid may be declared unacceptable if neither a unit price nor a total price is shown.
14. The undersigned firm certifies that it has not been convicted of bribery or attempting to bribe an officer or employee of the **State of Illinois**, nor has the firm made an omission of guilt of such conduct which is a matter of record, nor has an official, agent, or employee of the firm committed bribery or attempted bribery on behalf of the firm and pursuant to the direction or authorization of a responsible official of the firm. The undersigned firm further certifies that it is not barred from contracting with any unit of State or local government as a result of a violation of the State laws prohibiting bid-rigging or bid-rotating.

NOTE: BIDDERS SHALL SUBMIT A PRICE FOR EACH ITEM IN THE BIDDING SCHEDULE AND IN THE SCHEDULE OF PRICES (SECTION 00 42 43). FAILURE TO DO SO MAY RESULT IN REJECTION OF THE PROPOSAL. THE COMPLETED SCHEDULE OF PRICES (SECTION 00 42 43) SHALL ACCOMPANY THE BID PROPOSAL.

BIDDING SCHEDULE:

A. TOTAL BID PRICE

FOR THE LUMP SUM/UNIT PRICE ITEMS (TOTAL PER SECTION 00 42 43) (A completed Section 00 42 43 must accompany the Bid)

For the furnishing of all labor, materials and equipment for **Chatham Lift Station Reconstruction**, the lump sum of

_____ Dollars & _____ Cents
(in writing) (in writing)

\$ _____
Total (in figures)

EXCEPTIONS AND DEVIATIONS

The Bidder shall list herein all exceptions and deviations taken to the Contract Documents by Section and page number. (Use additional sheets if required and state number of sheets).

Exceptions and deviations taken to the Contract Documents are (check one): None
(___); As Stated Below (___)/Sheet ___ of ___.

<u>Section/Pg. No.</u>	<u>Description of Exception/Deviation</u>
------------------------	---

SUBCONTRACTOR LISTING

The following list of subcontractors and equipment suppliers and class of work performed by each is submitted. Subcontractors are defined as persons, firms or corporations who supply labor and/or materials for work under this Contract.

Subcontractor/Supplier

Class of Work

Control System

BIDDER'S EXPERIENCE/QUALIFICATIONS

To demonstrate the Bidder's experience/qualifications the Bidder shall list herein at least five (5) similar projects equal or greater in capacity which the Bidder has successfully completed within the past five (5) years.

<u>Owner</u> <u>Or</u> <u>Municipality</u>	<u>General</u> <u>Project</u> <u>Description</u>	<u>Reference</u> <u>Name and</u> <u>Phone No.</u>	<u>Year</u> <u>Completed</u>
--	--	---	---------------------------------

Note: Bid will be considered "Non-Responsive" if the above experience listing, qualifications and requirements are not fulfilled.

BID CONDITIONS

It is expressly understood and agreed that quantities in the Bidding Schedule for Unit Price Work Items are approximate only, and that payment on the Contract will be made only on the actual quantities of Work complete in place, measured on the basis defined in the Contract Conditions and the Contract Specifications.

The undersigned has carefully checked the above Bidding Schedule against the Contract Drawings and Specifications before preparing this proposal and accepts the items listed in this Bid as substantially correct, both as to classification and amount, and as correctly listing the complete Work to be done in accordance with the Contract Drawings and Specifications.

If this Bid is accepted and the undersigned shall fail to contract as aforesaid and to give the Performance Bond and Payment Bond and to provide all insurance as required by the Contract Documents within **fifteen (15) calendar days** after the date of the award of the Contract, the Owner may, at his/her option, determine that the Bidder has abandoned his/her Contract, and thereupon this Bid and the acceptance thereof shall be null and void, and the forfeiture of such security accompanying this Bid shall operate and the same shall be the property of the Owner as liquidated damages.

BID SECURITY

Accompanying this Bid is a _____ in the amount of _____ Dollars (\$_____).

Note: Refer to Section 00 2113 for Bid Security requirements.

Attach Bid Security(s) Here

PROPOSAL SIGNATURE:

State of _____)
County of _____) ss

_____, being first duly sworn on oath deposes and says that the Bidder on the above Bid is organized as indicated below and that all statements herein made are made on behalf of such Bidder and that his/her deponent is authorized to make them.

_____, also deposes and says that he examined and carefully prepared his/her Bid from the Contract Drawings and Specifications and has checked the same in detail before submitting this Bid, that the statements contained herein are true and correct.

(Fill Out Applicable Paragraph Below)

If Bidder is:

An Individual

By _____ (SEAL)
(Signature PLUS Typed or Printed Individual's Name)

doing business as _____

Business address: _____

Phone Number: _____

A Partnership

By _____ (SEAL)
(Firm Name)

(Signature PLUS Typed or Printed Name of General Partner)

Business address: _____

Phone Number: _____

A Corporation

By _____
(Corporation Name)

(State of Incorporation)

By _____
(Signature PLUS Typed or Printed Name of Person Authorized to Sign)

(Title)

(Corporate Seal)

Attest _____ (SEAL)
(Secretary)

Business address: _____

Phone Number: _____

--END OF SECTION--

SCHEDULE OF PRICES
SECTION 00 42 43

The undersigned, having carefully examined all of the Contract Documents for **Chatham Lift Station Reconstruction** as well as the site of the Work and all conditions affecting the Work, including adjacent surroundings, shall furnish all services, labor, equipment and materials necessary to complete the Work for prices set forth in the following Schedule of Prices:

ITEM	PAY ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	ITEM COST
01 33 00	VIDEO DOCUMENTATION OF EXISTING CONDITIONS	L SUM	1		
01 50 00	TEMPORARY FACILITIES AND CONTROLS	L SUM	1		
01 51 00	TEMPORARY BYPASS PUMPING	L SUM	1		
01 57 13	EROSION AND SEDIMENT CONTROL	L SUM	1		
01 71 13	MOBILIZATION AND DEMOBILIZATION	L SUM	1		
02 41 00	DEMOLITION	L SUM	1		
03 00 00-1	WET WELL TOP SLAB	L SUM	1		
03 00 00-2	WET WELL	L SUM	1		
03 00 00-3	METER / VALVE / BYPASS VAULT	L SUM	1		
03 00 00-4	CONCRETE GENERATOR PAD	L SUM	1		
03 00 00-5	CONCRETE TRAFFIC BOX ENCLOSURE PAD	L SUM	1		
08 10 10	GOLFVIEW LIFT STATION SAFETY GRATE RETROFIT	L SUM	1		
22 13 13	PROCESS PIPING AND APPURTENANCES	L SUM	1		
22 13 19	PROCESS VALVES AND APPURTENANCES	L SUM	1		
22 13 29	SUBMERSIBLE SOLIDS HANDLING PUMPS AND APPURTENANCES	L SUM	1		
22 14 29	SUMP PUMP SYSTEM	L SUM	1		

ITEM	PAY ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	ITEM COST
26 05 16	ELECTRICAL WIRES AND CABLES	L SUM	1		
26 05 26	GROUNDING	L SUM	1		
26 05 33	ELECTRICAL CONDUIT	L SUM	1		
26 20 00-1	ELECTRIC SERVICE AND DISTRIBUTION	L SUM	1		
26 20 00-2	ELECTRIC SERVICE UTILITY FEE	ALLOWANCE	1	\$30,000.00	\$30,000.00
26 36 20	DIESEL ENGINE GENERATOR	L SUM	1		
31 23 16-1	EARTHWORK	L SUM	1		
31 23 16-2	COMPACTED CA-6 SUBGRADE	L SUM	1		
31 23 16-3	COMPACTED CA-1 SUBGRADE	L SUM	1		
31 41 00	TEMPORARY SOIL RETENTION SYSTEMS	L SUM	1		
32 12 16	HMA DRIVEWAY	SQ YD	55		
32 13 13-1	CONCRETE APRON, 6"	SQ YD	27		
32 13 13-2	CONCRETE SIDEWALK, 5"	SQ FT	825		
32 13 13-3	M3.12 CURB AND GUTTER	FOOT	25		
32 92 00	TOPSOIL, SEEDING, AND MULCH	L SUM	1		
33 05 19	DUCTILE IRON FORCE MAIN, 14-INCH	FOOT	10		
33 09 30	WASTEWATER PUMPING CONTROL SYSTEM COMPLETE	L SUM	1		
33 31 11	SANITARY SEWER, DUCTILE IRON, 18"	FOOT	23		
33 42 11-1	STORM SEWER, PVC SDR 26, 8"	FOOT	49		
33 42 11-2	INLET, TYPE A	EACH	1		
Bid Total =					

Notes:

1. The **Bid Total** shall include all required bonds and insurance.
2. The **Bid Total** shall be entered into Item A of the Bidding Schedule found on page 00 41 43-4 in Section 00 41 43 – Bid Form.

Respectfully Submitted:

Signature

Company

Title

Address

License Number (if applicable)

Date

(SEAL – if BID is by a corporation)

Attest

VILLAGE OF BUFFALO GROVE CONTRACT STATEMENTS

SECTION 00 45 13

I _____, do hereby certify that:

1. I am _____ of the _____.
Position Firm

and have authority to execute this certification on behalf of this firm.

2. CERTIFICATION OF CONTRACTOR / CONSULTANT

In order to comply with 720 Illinois Compiled Statutes 5/33 E-1 et seq., the Village of Buffalo Grove requires the following certification to be acknowledged:

The below-signed Contractor / Consultant hereby certifies that it is not barred from Bidding or supplying any goods, services or construction let by the Village of Buffalo Grove with or without Bid, due to any violation of either Section 5/33 E-3 or 5/33 E-4 of Article 33E, Public Contracts, of the Chapter 720 of the Illinois Compiled Statutes, as amended. This act relates to interference with public contracting, Bid rigging and rotating, kickbacks, and Biding.

3. CERTIFICATION RELATIVE TO 65 ILCS 5/11-42.1.1

In order to comply with 65 Illinois Compiled Statutes 5/11-42.1.1, the Village of Buffalo Grove requires the following certification:

The undersigned does hereby swear and affirm that it is not delinquent in the payment of any tax administered by the Illinois Department of Revenue unless it is contesting, in accordance with the procedures established by the appropriate revenue Act, its liability for the tax or the amount of the tax. The undersigned further understands that making a false statement herein: (1) is a Class A Misdemeanor, and (2) voids the contract and allows the Village to recover all amounts paid to it under the contract.

4. CONFLICT OF INTEREST

The Village of Buffalo Grove Municipal Code requires the following verification relative to conflict of interest and compliance with general ethics requirements of the Village:

The undersigned supplier hereby represents and warrants to the Village of Buffalo Grove as a term and condition of acceptance of this (bid or purchase order) that none of the following Village Officials is either an officer or director of supplier or owns five percent (5%) or more of the Supplier: the Village President, the members of the Village Board of Trustees, the Village Clerk, the Village

Treasurer, the members of the Zoning Board of Appeals and the Plan Commission, the Village Manager and his Assistant or Assistants, or the heads of the various departments within the Village.

If the foregoing representation and warranty is inaccurate, state the name of the Village official who either is an officer or director of your business entity or owns five percent (5%) or more thereof:

Name of Firm _____

Signature _____

Title _____

Date _____

Corporate Seal (where appropriate)

On this _____ day of _____, 20_____, before me appeared

(Name) _____ to me personally known, who, being duly

sworn, did execute the foregoing affidavit, and did state that he or she was properly authorized by

(Name of Firm) _____ to execute the

affidavit and did so as his or her free act and deed.

Notary Public _____ Commission Expires _____

Notary Seal

--END OF SECTION--

AFFIDAVIT OF NON-COLLUSION

SECTION 00 45 19

STATE OF ILLINOIS)
)SS
)

_____ being first duly sworn on oath deposes and states:

- a. That in connection with this procurement,
 - 1. the prices in this Bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
 - 2. the prices which have been quoted in this Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening directly or indirectly to any other bidder or to any competitor; and
 - 3. no attempt has been made or will be made by the Bidder to induce any other person or firm to submit or not to submit a Bid for the purpose of restricting competition.

- b. The undersigned further states
 - 1. He/She is the person in the Bidder's organization responsible within that organization for the decision as to the prices being bid herein and that he/she has not participated, and will not participate, in any action contrary to (a.1) through (a.3) above; or
 - 2. He/She is not the person in the Bidder's organization responsible within that organization for the decision as to the prices being bid herein but that he/she has been authorized in writing to act as agent for the persons responsible for such decision in certifying that such persons have not participated, and will not participate, in any action contrary to (a.1) through (a.3) above, and as their agent does hereby so certify; and (b) he/she has not participated, and will not participate, in any action contrary to (a.2) through (a.3) above.

- c. It is expressly understood that the foregoing statements, representations, and promises are made as a condition to the right of the Bidder to receive payment under any award made hereunder.

For Corporation: _____
(Corporate Seal) (Name) Signature - Indicate if corporation, partnership or sole proprietor

ATTEST:

(Office held in Bidder Organization)

SUBSCRIBED AND SWORN TO before me

this _____ day of _____, 20__

Notary Public

--END OF SECTION--

**NOTICE OF AWARD
SECTION 00 51 00**

TO: _____

PROJECT Description: _____

The OWNER has considered the BIDS received on _____, 20____, for the above described WORK in response to its Advertisement for Bids dated _____, 20__ and Instructions to Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____.

You are required by the INSTRUCTIONS TO BIDDERS to execute the AGREEMENT and furnish the required CONTRACTOR'S PERFORMANCE BOND, PAYMENT BOND and CERTIFICATE OF INSURANCE within fifteen (15) calendar days from the date of this Notice to you.

If you fail to execute said AGREEMENT and to furnish said BONDS within fifteen (15) calendar days from the date of this NOTICE, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID SECURITY. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledge copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 20_____.

(Owner)

BY: _____

TITLE: _____

ACCEPTANCE OF NOTICE

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

this the _____ day of _____, 20_____.

BY: _____

TITLE: _____

--END OF SECTION--

CONTRACT AGREEMENT

SECTION 00 52 13

THIS AGREEMENT, made this _____ day of _____, 20____ by and between the **Village of Buffalo Grove** hereinafter called "Owner", and _____, hereinafter called "Contractor".

WITNESSETH:

WHEREAS, Owner has heretofore, solicited Bids for all the Work and improvements and for the doing of all things included within the hereinafter specified and related to **Chatham Lift Station Reconstruction**.

WHEREAS, Owner did on the _____ day of _____, 20____, find that Contractor was the lowest responsible bidder for hereinafter specified Work and did award Contractor a contract for said Work.

NOW, THEREFORE, for and in consideration of their mutual promises, covenants, undertaking and agreements, the parties hereto do hereby agree as follows:

ARTICLE I - WORK TO BE DONE BY CONTRACTOR

Contractor agrees, at his/her own cost and expense, to do all the Work and to furnish all the labor, materials, equipment and other property necessary to perform and complete all the Work and improvements required for and related to the **Chatham Lift Station Reconstruction** all in full accordance with and in compliance with and as required by the hereinafter specified Contract Documents, including any and all Addenda for said Work, and to do, at his/her own cost and expense, all other things required of the Contractor by said Contract Documents for said Work.

All Work shall be performed in accordance with applicable laws and government agency regulations and rules; Authorities having jurisdiction; OSHA regulations and rules; and any applicable rules and regulations of the **State of Illinois** or **Cook County** agencies. Furthermore, and as related to the Work, the Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of all public authorities bearing on the safety of persons or property or their protection from damage, injury or loss.

ARTICLE II - CONTRACT DOCUMENTS

The term Contract Documents shall have the meaning prescribed in the Owner's Standard General Conditions of the Contract and in the Standard General Conditions of the Construction Contract, as amended by Owner. Nothing herein is intended to or shall limit said definition. The Contract Documents herein named also include all of the

following component parts, all of which are as fully a part of this Contract as if herein set out verbatim, or if not attached, as if hereto attached:

1. Instructions for Submitting Bids
2. Bid Form
3. This Contract Agreement
4. Owner's Standard General Conditions of the Contract
5. Standard General Conditions of the Construction Contract
6. Supplementary Conditions (if any)
7. Contract Specifications
8. Contract Drawings
9. All Bonds, Insurance Certificates and Insurance Policies mentioned or referred to in the foregoing Documents.
10. Any and all other Documents or Papers included or referred to in the foregoing Documents.
11. Any and all Addenda to the foregoing.
12. Affidavit of Non-Collusion
13. Bidder Certification in Compliance with Article 33E to the Criminal Code of 1961

If the Owner determines a conflict exists between the Owner's Standard General Conditions of the Contract and the Standard General Conditions of the Construction Contract, the Owner's Standard General Conditions of the Contract shall take precedence.

ARTICLE III - CONTRACT PRICE

The Contractor agrees to receive and accept the following total lump sum bid price (and as may be adjusted for unit price work actually performed) as full compensation for furnishing all materials and equipment and for doing all the Work contemplated and embraced in this Agreement; also for all loss or damage arising out of the nature of the Work aforesaid, or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the Work until its acceptance by the Owner, and for all risks of every description connected with the Work; also for well and faithfully completing the Work, and the whole thereof, in the manner and according to and in compliance with the Contract Documents and the requirements of the Engineer under them; also for any and all other things required by the Contract Documents, to wit:

Owner agrees to pay Contractor for performance of Work in accordance with the Contract Documents in current funds as follows:

Total Contract Price of _____ Dollars (\$ _____).
(in writing) (in figures)

This Total Contract Price includes all Bonds, materials, labor, equipment, permits, applicable fees, approvals, licenses and insurance (as required under the Contract Documents).

Plus the following (List in detail additional work, if any, and corresponding amounts):

ARTICLE IV - CONTRACT TIME

The Work of this Contract shall include all Work in accordance with the Contract Documents prescribed and specified and as related to the **Chatham Lift Station Reconstruction**. The Work of this Contract shall be totally completed **within 235 consecutive calendar days** from the date which the Notice to Proceed is issued. The Contractor agrees to commence Work (**weather permitting**) under this Contract within **thirty calendar days** after the receipt from the Owner of a fully executed Agreement and Notice to Proceed and to fully complete all Work included in this Contract to the point of final acceptance by the Owner within the previously specified time period.

ARTICLE V - LIQUIDATED DAMAGES

OWNER and CONTRACTOR recognize that time is of the essence in this Agreement and that OWNER will suffer financial loss if the Work is not completed within the time specified above, plus any extensions thereof allowed by the Owner in writing. They 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 \$500 for each calendar day that expires after the specified completion time until the Work is completed and Final Acceptance is made by the Owner. In addition, the Contractor agrees that additional liquidated damages shall be paid to the Owner as applicable and in accordance with Section 01 32 16 of the Specifications and/or other provisions of the Contract Documents.

In addition to liquidated damages described herein, the Contractor shall be fully responsible and liable for all additional costs for Engineer's or Owner's Representative's services incurred by Owner beyond scheduled contract completion time. Owner is entitled and will deduct these costs from any monies due or that may become due the Contractor, and pay Engineer or Owner's Representative for said services.

To the fullest extent permitted under law, the liquidated damages provided hereunder are in addition to any and all other legal or equitable remedies available to Owner as a result of Contractor's failure to perform under the Contract Documents or its negligence.

In addition, Contractor shall be required to reimburse the Owner for any fees and costs expended to obtain liquidated damages.

ARTICLE VI - PAYMENTS TO CONTRACTOR

General: Owner agrees with said Contractor to employ and does hereby employ, the said Contractor to provide the materials and do all the Work and do all other things hereinabove mentioned according to the terms and conditions hereinabove contained or

referred to for the Total Contract Price aforesaid and hereby contracts to pay the same at the time, in the manner and upon the condition set forth or referred to hereinafter; and the said parties for themselves, their heirs, executors, administrators, successors and assigns do hereby agree to the full performance of the covenants herein contained.

Waiver of Lien. The Contractor shall submit Partial Waivers of Lien acceptable to the **Owner** prior to receiving his/her monthly payment and a Final Waiver of Lien before receiving his/her final payment. Three (3) originally signed copies of each of these Waivers shall be delivered to the Engineer together with the Contractors application for payment. A Partial and Final Waiver of Lien shall also be required from each subcontractor and material supplier before a partial or final payment is made.

Certified Payroll. The Contractor, and all Subcontractors participating on the Project, shall make and keep those records required under Section 5 of the Prevailing Wage Act in paper or electronic format. In conformance with the Act, each contractor and subcontractor, or other entity performing work on the project, shall maintain records of all laborers, mechanics and other workers employed by them on the project, including the following information on each worker: (1) name; (2) address; (3) telephone number when available; (4) social security number; (5) classification or classifications; (6) gross and net wages paid in each pay period; (7) number of hours worked each day; (8) starting and ending times of each day; (9) hourly wage rate; (10) hourly overtime wage rate; (11) hourly fringe benefit rates; (12) the name and address of each fringe benefit fund; (13) the plan sponsor of each fringe benefit, if applicable; and (14) the plan administrator of each fringe benefit, if applicable. No later than the 15th day of each calendar month, each participating contractor and subcontractor shall submit a monthly certified payroll to the Village consisting of the above-referenced information as well as a statement signed by the participating contractor or subcontractor that certifies: (a) the records are true and accurate; (b) the hourly rates paid to each worker is not less than the general prevailing rate of hourly wages required under the Prevailing Wage Act; and (c) the contractor or subcontractor is aware that filing a certified payroll that he or she knows to be false is a Class A misdemeanor.

Application for Payment: CONTRACTOR shall submit Applications for Payment on a monthly basis and in accordance with the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

Progress Payments: OWNER shall make monthly progress payments on account of the Contract Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER, on or about the fifteenth day of each month during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the schedule of values for materials received and work performed.

Retention of Payment: Retention for payment shall be as follows: For the first 50 percent of completed Work, there shall be deducted 10 percent to be retained until after the completion of the entire Work to the satisfaction of the Owner. After 50 percent or

more of the Work is completed, the Owner may, at his/her sole discretion apply a reduction of the withholding to five percent (5%) of the dollar value of all Work satisfactorily completed to date (provided the Contractor is making satisfactory progress and there is no specific cause for greater withholding) and provided that the amount retained is not less than 5 percent of the total adjusted Contract Price.

The Owner may reinstate up to ten percent (10%) withholding (after the first 50% of the Work is completed) if in the opinion of the Owner, and at the Owner's sole discretion, that the Contractor is not making satisfactory progress or there is other specific cause for such withholding.

Final Payment: Upon final completion and acceptance of the Work in accordance with the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by the ENGINEER as provided in said General Conditions.

IN WITNESS WHEREOF, the parties hereto have caused this Instrument to be executed the day and year first above written.

Contractor

By _____

Title _____

(SEAL)

ATTEST:

TITLE: _____

VILLAGE OF BUFFALO GROVE
Owner

By _____

Title _____

(SEAL)

ATTEST:

TITLE: _____

IMPORTANT

NOTE: If the Contractor is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation; if Contractor is a co-partnership, the true name of the firm shall be set forth above, together with the signatures of all partners; and if the contractor is an individual, his/her signature shall be placed above. If signature is by an agent other than an officer of a corporation or a member of a partnership, a power-of-attorney must be attached hereto. Signature of Contractor shall also be acknowledged before a Notary Public or other person authorized by law to execute such acknowledgment.

--END OF SECTION--

**NOTICE TO PROCEED
SECTION 00 55 00**

TO: _____ DATE: _____

_____ PROJECT: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 20____, on or before _____, 20____, and you are to bring to substantial completion the installation and place into operation the equipment and improvements, and to fully complete the Work within **235** consecutive calendar days from the foregoing specified commencement date. The completion date of all WORK is therefore _____, 20____.

(Owner)

BY: _____
TITLE: _____

ACCEPTANCE OF NOTICE

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

this the _____ day of _____, 20____.

BY: _____

TITLE: _____

--END OF SECTION--

PERFORMANCE BOND

SECTION 00 61 13

KNOW ALL MEN BY THESE PRESENTS THAT _____

(insert the name and address or legal title of the Contractor)

as Principle, hereinafter called Contractor, and

(insert the legal title of Surety)

as Surety, hereinafter called Surety, are held firmly bound unto the **(OWNER)** _____

_____ as obligee, hereinafter called the
Owner in the full and just sum of

_____ DOLLARS (\$ _____)

lawful money of the UNITED STATES OF AMERICA for the payment of which sum of money well and truly to be made, we bind ourselves, heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered in to a certain written contract, dated the ___ day of _____, A.D. 20____, with the _____ for _____

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the said Principal shall in all respects well and truly keep and perform the said Contract, and shall pay all sums of money due or to become due, for any labor, materials, apparatus, fixtures or equipment furnished for the purpose of constructing the Work provided in said Contract, and shall remove and replace any defects in workmanship or materials which may be apparent or may develop within a period of one (1) year from the Date of Final Acceptance, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20____.

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

Principal

Witness:

(If Individual or Firm)

Attest:

(If Corporation)

_____ (SEAL)

_____ (SEAL)

Attest:

(Surety)

--END OF SECTION--

PAYMENT BOND

SECTION 00 61 14

KNOW ALL MEN BY THESE PRESENTS THAT _____

(insert the name and address or legal title of the Contractor)

as Principle, hereinafter called Contractor, and

(insert the legal title of Surety)

as Surety, hereinafter called Surety, are held firmly bound unto the **(OWNER)** _____

as obligee, hereinafter called the
Owner in the full and just sum of

_____ DOLLARS (\$ _____)

lawful money of the UNITED STATES OF AMERICA for the payment of which sum of money well and truly to be made, we bind ourselves, heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

WHEREAS, the Principal has entered in to a certain written contract, dated the ____ day of _____, A.D. 20____, with the _____

for _____

NOW THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the said Principal shall in all respects well and truly keep and perform the said Contract, and shall pay all sums of money due or to become due, for any and all persons, firms, subcontractors and corporations furnishing materials for or performing labor in the prosecution of the Work provided for in the Contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, and other fuels, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work, and all insurance premiums on said Work, and for all labor, performed in such Work whether by subcontractor or otherwise, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications. All payments made hereunder by the Surety shall be made in accordance with the Illinois Prevailing Wage Act.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20____.

Principal

Witness:

(If Individual or Firm)

Attest:

(If Corporation)

(SEAL)
(SEAL)

Attest:

(Surety)

IMPORTANT: Surety companies executing BONDS must be authorized to transact business in the state where the Project is located.

--END OF SECTION--

CERTIFICATE OF INSURANCE

SECTION 00 62 16

INSURANCE REQUIREMENTS

Before commencing Work, the Contractor shall obtain at his/her own expense, and agree to keep in effect during the life of this Contract, as a minimum requirement, the following insurance in a company or companies acceptable to the Owner; (and authorized to transact business under the laws of the **State of Illinois**):

1. The Contractor shall purchase and maintain liability insurance as required until all Work required under the Contract has been completed and accepted by the Owner, except as otherwise provided. The insurance required shall be written for not less than those stipulated under the Owner's Standard General Conditions of the Contract (Section 00 70 00, Part 2.02).
2. Contractor shall renew any policy which expires during the performance of the Contract and shall notify Owner by appropriate Certificate of Insurance, with all required policy endorsements, of such renewal prior to the expiration date.
3. The **Village of Buffalo Grove** (Owner) and **Ciorba Group** (Engineer) shall be added as an additional insured to the Contractor's general liability/property damage policy, automobile liability and property damage policy and employer's liability coverage. Owner/Engineer shall be named as an alternate employer on Contractor's Worker's Compensation coverage. Contractor hereby waives the right of subrogation against Owner as to any claims under worker's compensation and employer's liability policies.
4. Certificates of Insurance naming Owner and Engineer as additional insured, with insurance companies which are acceptable to the Owner, shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least sixty (60) calendar days prior written notice has been given to Owner.
5. All coverages shall be provided upon an occurrence basis, unless claims-made coverages are expressly approved, in writing, by Owner's designated Director of Risk Management and Insurance. Contractor shall renew any policy which expires during the performance of the contract and shall notify Owner by appropriate Certificate of Insurance of such renewal prior to the expiration date.
6. The Contractor agrees to indemnify and save harmless the Owner, Ciorba Group, and all of their officers, partners, agents and employees from and against all loss or expense (including court costs and attorney's fees) by reason of liability imposed by law upon Owner and Ciorba Group, for damages because of bodily injury, including death at any time, resulting therefrom sustained by any

person or persons or on account of damage to or destruction of property, real or personal, including loss of use thereof, arising out of or in consequence of performance of this Work, whether such injuries to or death of persons or damage to property is due or claimed to be due to the negligence of the Contractor, his/her Subcontractors, the Owner, Ciorba Group, their officers, partners, agents, and employees except only such injury, death or damage as shall have been occasioned by the sole negligence of the Owner or Ciorba Group.

--END OF SECTION--

OWNER'S STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

SECTION 00 70 00

PART 1 – GENERAL

1.01 The Owner's General Conditions of the Contract (pages 00 70 00-1-7) and the Engineers Joint Contract Documents Committee (2013 Edition) Standard General Conditions of the Construction Contract as amended by any Supplemental Specifications, shall apply to the Work in this Contract. Should the Owner's General Conditions of the Contract be in conflict with the Standard General Conditions of the Construction Contract as amended, the Owner's General Conditions of the Contract shall prevail.

PART 2 – GENERAL CONDITIONS OF THE CONTRACT

2.01 CONTRACT SECURITY

The Contractor shall furnish a surety bond in an amount at least equal to 100 percent of the aggregate amount of the Contract as security for the faithful performance of the Contract and for the payment of all persons performing labor and furnishing materials in connection with this Contract.

2.02 CONTRACTOR'S INSURANCE

Contractor shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. ISO Additional Insured Endorsement CG 20 10 or CG 20 26 and CG 20 01 04 13. CG 20 37 - Completed Operations.

A. Minimum Scope of Insurance: Coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability occurrence form CG 0001 (Ed. 11/85) with the Village and Ciorba Group, 8725 W. Higgins Road, Suite 600, Chicago, IL 60631 (hereinafter, Engineer) named as additional insured; and
2. Insurance Service Office Business Auto Liability coverage form number CA 0001 (Ed. 10/90 or newer), Symbol 01 "Any Auto."
3. Workers' Compensation as required by the Labor Code of the State of Illinois and Employers' Liability insurance.
4. Owners and Contractors Protective Liability (OCP) policy with the Village of Buffalo Grove as insured.
5. Builder Risk Property Coverage with Village as loss payee

B. Minimum Limits of Insurance: Contractor shall maintain limits no less than:

1. Commercial General Liability: \$3,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage. The general aggregate shall be twice the required occurrence limit. Minimum General Aggregate shall be no less than \$6,000,000 or a project/contract specific aggregate of \$3,000,000.
2. Business Automobile Liability: \$3,000,000 combined single limit per accident for bodily injury and property damage.
3. Workers' Compensation and Employers' Liability: Workers' Compensation coverage with statutory limits and Employers' Liability limits of \$1,000,000 per accident.
4. Owners and Contractors Protective Liability (OCP): \$1,000,000 combined single limit per occurrence for bodily injury and property damage.
5. Builder's Risk: Shall insure against "All Risk" of physical damage, including water damage (flood and hydrostatic pressure not excluded), on a completed replacement cost basis.

C. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the Village. At the option of the Village, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Village, its officials, agents, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigation, claim administration and defense expenses.

D. Other Insurance Provisions

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability and Automobile Liability Coverages:

The Village, its officials, agents, employees and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Village, its officials, agents, employees and volunteers.

2. The Contractor's insurance coverage shall be primary as respects the Village, its officials, agents, employees and volunteers and Engineer. Any insurance or self-insurance maintained by the Village, its officials, agents, employees and volunteers or Engineer shall be excess of Contractor's insurance and shall not contribute with it.

3. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to the Village, its officials, agents, employees and volunteers and Engineer.
4. The contractor's insurance shall contain a Severability of Interests/Cross Liability clause or language stating that Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

E. All Coverages:

Each insurance policy required by this paragraph shall be endorsed to state that coverage shall not be suspended, voided, cancelled, reduced in coverage or in limits except after sixty (60) days prior written notice by certified mail, return receipt requested, has been given to the Village.

F. Acceptability of Insurers

Insurance is to be placed with insurers with a Best's rating of no less than A-, VII and licensed to do business in the State of Illinois.

G. Verification of Coverage

Contractor shall furnish the Village with certificates of insurance naming the Village, its officials, agents, employees, and volunteers as additional insured's and with original endorsements, affecting coverage required herein. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates and endorsements are to be received and approved by the Village before any work commences. The Village reserves the right to request full certified copies of the insurance policies and endorsements.

H. Subcontractors

Contractor shall include all subcontractors as insured's under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage's for subcontractors shall be subject to all of the requirements stated herein.

I. Assumption of Liability

The contractor assumes liability for all injury to or death of any person or persons including employees of the contractor, any subcontractor, any supplier or any other person and assumes liability for all damage to property sustained by any person or persons occasioned by or in any way arising out of any work performed pursuant to this agreement.

J. Indemnity/Hold Harmless Provision

To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold harmless Owner and Engineer, and their officers, directors, members, partners,

employees, agents, consultants, and subcontractors from and against all claims, suits, costs, losses, fees, expenses, liabilities, and damages arising out of, in whole or in part, or relating to the performance of the Work described in these Contract Documents caused by any act or omission of Contractor, or any subcontractor, employee, or agent directly or indirectly employed by Contractor. Contractor expressly acknowledges and agrees that any performance bond or insurance policies required by this Contract, or otherwise provided by Contractor, shall in no way limit the responsibility to indemnify, keep and save harmless, and defend the Owner and Engineer, and their officials, agents, employees, as herein provided.

K. Retention of Payments:

The Contractor further agrees that to the extent that money is due the Contractor by virtue of this contract as shall be considered necessary in the judgment of the Village, may be retained by the Village to protect itself against said loss until such claims, suits, or judgments shall have been settled or discharged and/or evidence to that effect shall have been furnished to the satisfaction of the Village.

L. Patent Fees and Royalties:

Contractor shall indemnify and hold harmless the Village and anyone directly or indirectly employed by either of them from and against all claims, damages, losses, and expenses (including attorneys' fees and court and arbitration costs) arising out of 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, and shall defend all such claims in connection with any alleged infringement of such rights.

M. Request for Payment

Contractor shall submit a sworn Contractor's affidavit along with completed and executed lien waivers with each request for payment signed by each subcontractor and fully releasing Owner's liability for work completed up to the date of the submitted request.

2.03 CERTIFICATE OF AUTHORITY AND SURETY CERTIFICATE

The Contractor shall furnish the Owner with a current Certificate of Authority or Surety Certificate issued by the Illinois Department of Insurance (IDOI) for the bonding company that they are using.

The Contractor shall also furnish the Owner with a current Certificate of Authority issued by the Illinois Department of Insurance (IDOI) for the insurance company that they are using.

2.04 PLANS AND SPECIFICATIONS

The Plans and Specifications and any work shown thereon shall be executed the same as if specifically mentioned herein and should any discrepancy between plans and

specifications appear, the ruling of the Public Works Director on the interpretation thereof shall be final and binding.

It is the intention of these Plans and Specifications to provide for this improvement in a complete, thorough and workman-like manner. The Contractor to whom the work is awarded shall furnish all materials, labor, tools, appliances, appurtenances, and all things necessary to complete the work in accordance with these Plans and Specifications, and anything omitted that may be interpreted as reasonably necessary to such completion is to be merged in the prices bid for the improvement.

2.05 CHANGES

If the Public Works Director deems it proper or necessary in the execution of the work to make any alteration which will increase or diminish the quantity of labor or material or the expense of the work, even to the elimination of one or more items, such alteration shall not annul or vitiate the Contract hereby entered into. The elimination of any part of the work shall not increase the unit price for any of the remaining work bid on. The value of the work so added shall be based on the rates and prices named in the Contract, and bid, when such rates and prices cover the class of work added, otherwise the value shall be determined by mutual agreement between the Owner and Contractor, before such work shall be commenced.

Changes in Contract scope, price, or time shall conform to Article 11 of the Standard General Conditions of the Construction Contract by means of a change order.

2.06 EXTRA WORK

No claim whatsoever will be allowed the Contractor for changes, extra work or material not completed or necessary for the completion of the work described, or for a greater amount of money than is hereby stipulated to be paid, unless the change in or addition to the work requiring additional outlay by the Contractor is first ordered in writing by the Public Works Director, and the price therefore agreed to in writing.

Minor changes or small modifications in the specifications which may be made to suit some special condition or situation shall not be construed as a precedent for like changes at other times, nor shall such modifications be construed by the Contractor as removing the work from the classification given in the proposal, and placing it under the category of "Extra Work".

2.07 NOTICE OF STARTING WORK

The Contractor shall notify the Public Works Director forty-eight (48) hours before beginning any work on this Contract, or of its intention so to do; in case of a temporary suspension of the work he shall give a similar notice before resuming same.

2.08 SEQUENCE

The Public Works Director shall have the power to direct the order and sequence of the work. On any major portion of the work, all accessories shall be set coincident with the main construction. Payment for major portion of the work may be withheld until proper completion of accessories.

2.09 SUPERVISION

The Public Works Director shall have override power to superintend and direct the work, and the Contractor shall perform all of the work herein specified, to his entire satisfaction, approval and acceptance.

2.10 SUBCONTRACTORS

The apparent low Bidder shall submit to the office of the Engineer within ten (10) calendar days after the receipt of bids, a list of the names of Bidder's proposed subcontractors along with a description of the work to be performed by each. The Village will then review and reserves the right to reject the use of any subcontractor on the project due to past performance or the apparent inability to properly perform the item of work.

2.11 CONTRACTOR'S REPRESENTATIVE

The Contractor shall have at all times a competent foreman or superintendent at the work site, who shall have full authority to act for the Contractor and to receive and execute orders from the Public Works Director, and any instructions given to such superintendent or person, executing work for the Contractor, shall be binding on the Contractor as though it was personally given to the Contractor.

2.12 WORKERS

The Contractor shall employ competent foremen and laborers and shall reassign, at the request of the Public Works Director, any incompetent, unfaithful, abusive or disorderly workers in its employ. None but workers expert in their respective branches of work shall be employed where special skill is required.

The Contractor shall provide and maintain such sanitary accommodations for the use of its employees as may be necessary to comply with the State and local Board of Health requirements. Public nuisances will not be permitted.

2.13 USE OF FIRE HYDRANTS

The use of fire hydrants will not be permitted. The Contractor can obtain non-potable water in bulk at no charge at the Buffalo Grove Public Works Department, 51 Raupp Blvd. The indiscriminate use of fire hydrants is strictly prohibited. The Contractor shall provide the water truck and driver to obtain and transport the water. The Village reserves the right to restrict or refuse the use of Village water, if deemed necessary. The Contractor will be

responsible for executing the required paperwork and follow all requirements of the Village. The Village reserves the right to impose a fine of \$1,000 per occurrence for operating a Village fire hydrant.

2.14 CLEAN CONSTRUCTION DEMOLITION DEBRIS

Work under this item shall be performed in compliance with the Illinois Environmental Protection Agency (IEPA) guidelines in effect at the time of construction

The Contractor will be required to make all arrangements for coordination and submission of the necessary documents with their chosen CCDD or other suitable disposal facility. Written confirmation of preliminary approval must be provided from the disposal facility and confirmed by the Village as acceptable.

All surplus, clean material generated from the Contractor's activities must be disposed of at an IEPA permitted CCDD or otherwise acceptable facility. The Contractor is responsible for providing documentation to the Village for each load hauled off-site showing the quantity of material and the location the material was disposed of.

Disposal of clean material not in compliance with these requirements will constitute a breach of contract. If the Contractor fails to provide adequate documentation supporting the legal disposal of clean material according to this special provision, the Contractor shall be fined \$1,000 per load of material and will assume all liability associated with material disposed if not in compliance with this special provision.

No extra compensation will be allowed to the Contractor for any expenses incurred complying with these requirements including but not limited to: delays, inconvenience, or interruptions in the work resulting from compliance with these requirements. All costs associated with material testing and disposal shall be included into the appropriate unit bid prices for the work. f

2.15 CERTIFIED PAYROLL

The Village of Buffalo Grove requests the prime Contractor send all certified payroll, including sub consultants and EEO reporting, electronically in separate files for each representative Contractor / subcontractor with the week's ending date in the file name to the project representative identified during the preconstruction meeting (i.e. Contractor Name_Week Ending.pdf). A sample letter will be provided at the preconstruction meeting. The Contractor is responsible for providing all records to Village per IDOL's requirements pertaining to the Prevailing Wage Act on the standard IDOL form. Only the last four (4) digits of the employee's social security number will be required; the remaining digits shall be "X" or redacted. To complete the certified payroll request for release of payment the Contractor must supply a signed and notarized written statement that all necessary

documentation has been turned over for the pay period pertaining to that payment requested.

Under P.A. 98-0328, the public body must retain copies of the certified payroll for 5 years rather than 3 years as was the case previously. The Illinois Department of Labor (IDOL) has created model certified payroll forms which can be found at the IDOL website www.illinois.gov/idol. The new form consists of three pages identified as the “certified transcript of payroll affidavit” and under P.A. 98-0482, contractors and subcontractors will have to provide additional information with respect to working hours, wage rates, overtime rates and fringe benefits. The IDOL’s model certified payroll forms are the most current forms for compliance with P.A. 98-0482 and should be used in public works contracts.

2.16 MONETARY PENALTIES

All work shall be completed by the Contractor in accordance with the Contract in a reasonable and timely manner. For each occurrence that work is not completed in a reasonable and timely manner a monetary penalty will be deducted from the final pay application. The Contractor shall make themselves aware of the following penalties:

Description	Penalty	Per Occurrence
Failure to sweep roadway	\$250	Calendar Day
Failure to maintain trench	\$250	Calendar Day
Use of fire hydrant and/or valve	\$1,000	Each
Failure to provide Maintenance of Roadway in a timely manner as determined by the Engineer	\$1,000	Calendar Day
Entering private property	\$500	Per Occurrence
Failure to provide portable facilities	\$100	Calendar Day
Illicit discharge of silt or construction debris	\$1,000	Per Occurrence
Failure to submit shop drawings on time	\$500	Per Occurrence
Failure to maintain erosion and/or sediment control devices	\$1,000	Per Occurrence
Working outside allowable time period	\$1,000	Per Occurrence

2.17 SAW CUTTING

The Contractor shall be required to saw cut all items prior to their removal to prevent damage to existing hardscape to remain. All saw cuts shall be full depth of the pavement depth; simple scoring will not be allowed. Saw cut locations may or may not be shown on the plans/specifications but shall still be required in the field.

Any damage caused to existing hardscape improvements due to not performing full depth saw cuts shall be removed and replaced to the satisfaction of the Engineer at no additional cost to the Village.

2.18 WATER AND SEWER SERVICES

The Village of Buffalo Grove will not locate private water and sewer service lines as part of JULIE. The property owner is the owner of these services from the building to the main and are exempt from the JULIE system.

The Contractor is fully responsible for protecting all utilities near or in their excavation area and shall make themselves fully aware of the exact location of each utility; marked or not marked. At their own expense, the Contractor may elect to locate any and all utilities marked to verify their location. Repeated damage to service lines will need to be repaired from the main to the right-of-way as directed by the Engineer. The Contractor will be responsible for repairs to all damaged utilities incurred as determined by the Village and/or Engineer.

All repairs to damaged water and sewer service lines shall be done with material equal to or matching the existing service size. Connections of dissimilar materials shall be made with stainless steel non-shear mission couplings or appropriate flare couplings for water services.

This work will not be paid for separately.

2.19 RETAINAGE AND WAIVERS

The Village of Buffalo Grove has the option to retain from the amount due to the contractor a maximum of 10% from each pay request. The Contractor may request the retainage be reduced and provide reasoning for such reduction in writing to the Village. The Village has the option to accept or deny the request, such decision by the Village shall be final. The retainage may be held until the Village determines the project to be final and accepted, at which time any warranty or maintenance period will begin

Along with each pay request the Contractor shall submit waivers from all subcontractors and material suppliers for the work payment is requested from the Village. Trailing waivers will not be permitted. The Village will not remit payment to the Contractor until all waivers for the work the Contractor is requesting payment for are received and reviewed. To help expedite the process the Village is willing to review draft waivers after the invoice has been submitted for the pay request. Once the draft waivers are reviewed and found acceptable, and the check is cut according to the Village's Warrant schedule, then the check and final waivers can be exchanged.

2.20 TERMINATION OF CONTRACT

The Contract may be terminated, in whole or in part, by either party if the other party substantially fails to fulfill its obligations under the Contract through no fault of the terminating party; or the Village may terminate the Contract, in whole or in part, for its convenience. However, no such termination may be effected unless the terminating party gives the other party: (1) not less than ten (10) calendar days written notice by certified mail of intent to terminate, and (2) an opportunity for a meeting with the terminating party before termination.

2.21 COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable laws, regulations and rules promulgated by any federal, state, local, or other governmental authority or regulatory body pertaining to all aspects of the Work, now in effect, or which may become in effect during the performance of the Work. The scope of the laws, regulations, and rules referred to in this paragraph includes, but is in no way limited to, the Illinois Human Rights Act, Illinois Equal Pay Act of 2003, Occupational Safety & Health Act along with the standards and regulations promulgated pursuant thereto (including but not limited to those safety requirements involving work on elevated platforms), all forms of traffic regulations, public utility, Interstate and Intrastate Commerce Commission regulations, Workers' Compensation Laws, Public Construction Bond Act, Public Works Preference Act, Employment of Illinois Workers on Public Works Act, USA Security Act, federal Social Security Act (and any of its titles), and any other law, rule or regulation of the Illinois Department of Labor, Department of Transportation, Illinois Environmental Protection Act, Illinois Department of Natural Resources, Illinois Department of Human Rights, Human Rights Commission, EEOC, and the Village of Buffalo Grove. Notwithstanding the following, the Contractor shall particularly note that:

- A. **NO DISCRIMINATION** – The Contractor shall comply with the provisions of the Illinois Public Works Employment Discrimination Act and the Illinois Human Rights Act/Equal Opportunity Clause which, pursuant to Illinois law, are deemed to be part of this Contract.
- B. **FREEDOM OF INFORMATION** - The Contractor agrees to furnish all documentation related to the Contract, the Work and any documentation related to the Village required under an Illinois Freedom of Information Act (ILCS 140/1 et. seq.) ("FOIA") request within five (5) calendar days after the Village issues Notice of such request to the Contractor. The Contractor agrees to defend, indemnify and hold harmless the Village, and agrees to pay all reasonable costs connected therewith (including, but not limited to attorney's and witness fees, filing fees and any other expenses) for the Village to defend any and all causes, actions, causes of action, disputes, prosecutions, or conflicts arising from Contractor's actual or alleged violation of FOIA or the Contractor's failure to furnish all documentation related to a FOIA request within five (5) calendar days after Notice from the Village for the same. Furthermore, should the Contractor request that the Village utilize a lawful exemption under FOIA in

relation to any FOIA request thereby denying that request, Contractor agrees to pay all costs connected therewith (such as attorneys' and witness fees, filing fees and any other expenses) to defend the denial of the request. This defense shall include, but not be limited to, any challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction.

- C. ILLINOIS WORKERS ON PUBLIC WORKS ACT - To the extent applicable, the Contractor shall comply with the Illinois Workers on Public Works Act, 30 ILCS 570/1 et seq., and shall provide to the Village any supporting documentation necessary to show such compliance.
- D. NOT A BLOCKED PERSON - The Contractor affirms and covenants that neither the Contractor nor any individual employed by the Contractor for this Work or under this Contract is a person forbidden from doing business with a unit of local government under Executive Order No. 13224 (Sept 23, 2001), 66 Fed.Reg. 49,079 (Sept 23, 2001) or is a person registered on the Specially Designated Nationals and Blocked Persons List. The Contractor shall indemnify the Village from all costs associated with failure to comply with this paragraph.
- E. SUBSTANCE ABUSE PREVENTION ON PUBLIC WORKS ACT - The Contractor knows, understands and acknowledges its obligations under the Substance Abuse Prevention on Public Works Act (820 ILCS 265/1 et seq.), and shall comply and require all subcontractors and lower tiered contractors to comply with the requirements and provisions thereof.
- F. PREVAILING WAGE ACT - The Village is an Illinois unit of local government and the Work hereunder is subject to the Illinois Prevailing Wage Act, 820 ILCS 130/0.01, et seq. Consequently, the Contract and each subcontractor shall submit monthly with their application for payment a certified payroll along with a signed statement attesting that: (i) such payroll is true and accurate; (ii) the hourly rate paid to each worker is at least equal to the prevailing wage for such work; and (iii) the Contractor or subcontractor is aware that filing a falsely certified payroll is a Class B Misdemeanor. Any delay in processing the payments due to a lack of certified payroll shall not be an event of default by the Village and shall not excuse any delay by the Contractor who shall proceed with the Work as if no delay in payment has occurred. The Contractor and Village shall agree to take any further steps not outlined above to ensure compliance with the Prevailing Wage Act. Upon two business day's Notice, the Contractor and each subcontractor shall make available to the Village their records to confirm compliance with the Prevailing Wage Act. Finally, to ensure compliance with Prevailing Wage Act, the Contractor and each subcontractor shall keep for a period of not less than 5 years after the Work has been completed records of all laborers, mechanics, and other workers employed by them for the Work; the records shall include each worker's name, address, telephone number, classification or classifications, the hourly wages paid in each period, the number of hours worked each day, the starting and ending times of work each day and, when available, last four digits of the social security number. The Contractor shall provide a list of every name, address, phone number and email of every sub-contractor for the Work.

Current rates can be located on the Illinois Department of Labor website.
<https://www2.illinois.gov/idol/Laws-Rules/CONMED/Documents/2019%20Rates/November%201/Cook.pdf>

2.22 NO WAIVER OF RIGHTS

A waiver by the Village of any Event of Default or any term or provision of this Contract shall not be a waiver of the same Event of Default, another Event of Default or any other term or provision of this Contract.

2.23 CONTROLLING LAW AND VENUE

This Contract is entered into in the State of Illinois, for work to be performed in the State of Illinois and shall be governed by and construed in accordance with the laws of the State of Illinois. Any legal matters or dispute shall be resolved in the Circuit Court of Cook County and the Parties hereby submit to the jurisdiction of such Circuit Court. This Contract shall be construed without regard to any presumption or other rule requiring construction against the Party causing the Contract to be drafted.

2.24 MISCELLANEOUS

- A. AMENDMENT – This Contract may be amended only in writing executed by both Parties.
- B. NO RECORDING – This Contract, or a memorandum thereof, may not be recorded in any form by either Party. If either Party records this Contract, or a memorandum thereof, they shall immediately file a release of the same.
- C. SECTION HEADINGS – The headings in the Contract are intended for convenience only and shall not be taken into consideration in any construction or interpretation of the Contract.
- D. NO THIRD PARTY BENEFICIARIES – This Contract does not confer any rights or benefits on any third party.
- E. BINDING EFFECT – This Contract shall be binding and inure to the benefit of the Parties hereto, their respective legal representatives, heirs and successors-in-interest.
- F. ENTIRE AGREEMENT – This Contract supersedes all prior agreements and understandings and constitutes the entire understanding between the Parties relating to the subject matter hereof.
- G. SEVERABILITY - If any term, condition or provision of the Contract is adjudicated invalid or unenforceable, the remainder of the Contract shall not be affected and shall remain in full force and effect, to the fullest extent permitted by law.

- H. TORT IMMUNITY DEFENSES - Nothing contained in this Contract is intended to constitute nor shall constitute a waiver of the rights, defenses, and immunities provided or available to the Village under the Local Governmental and Governmental Employees Tort Immunity Act, 745 ILCS 10 et seq.
- I. CALENDAR DAYS AND TIME. Unless otherwise provided in this Contract, any reference in this Contract to “day” or “days” shall mean calendar days and not business days. If the date for giving of any notice required to be given, or the performance of any obligation, under this Contract falls on a Saturday, Sunday or federal holiday, then the notice or obligation may be given or performed on the next business day after that Saturday, Sunday or federal holiday.

--END OF SECTION--

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



Issued and Published Jointly by



Endorsed by



These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC's Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. 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, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 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. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document 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, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer

has declined to address. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5101 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Engineer*—The individual or entity named as such in the Agreement.
21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.
26. *Notice of Award*—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.
27. *Notice to Proceed*—A written notice 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.
28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
29. *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.
30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.
33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. *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.
36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. *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, and such other lands furnished by Owner which are designated for the use of Contractor.
38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
39. *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.
40. *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.
41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
43. *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 a Subcontractor.
44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. *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 but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
46. *Unit Price Work*—Work to be paid for on the basis of unit prices.
47. *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; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs 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 Article 10 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 15.03 or 15.04).
- E. *Furnish, Install, Perform, Provide:*
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. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- 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. *Bonds*: 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 Contractor’s Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner’s Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), 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;
 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.

2.04 *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 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, 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 and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *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 2.03.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 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 the component parts of the Work.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or

computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, 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.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 *Reference Standards*

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, 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, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract 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, reference standard, 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 part of the Contract Documents prepared by or for Engineer. 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 part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

- A. *Reporting Discrepancies:*
 - 1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict,

error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents:* If, before or 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) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) 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 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
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 part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); 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 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers 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 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; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- 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.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *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 Contract 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 Contract. 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 Contract, whichever date is earlier.

4.02 *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 such date.

4.03 *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.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 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 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
- B. 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, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, 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 Times and Contract Price. 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.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. 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. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 2. abnormal weather conditions;
 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *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.
- 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 permanent improvements are to be made 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.

5.02 *Use of Site and Other Areas*

- A. *Limitation on Use of Site and Other Areas:*
 - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 - 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, 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 any such claim, and against all 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 directly or indirectly, in whole or in part

by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent 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 and adjacent areas 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 of 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 structures or land to stresses or pressures that will endanger them.

5.03 *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 adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site 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 5.03 is materially inaccurate; or
 2. is of such a nature as to require a change in the Drawings or Specifications; or
 3. differs materially from that shown or indicated in the Contract Documents; or
 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 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Possible Price and Times Adjustments:*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, 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 fall within any one or more of the categories described in Paragraph 5.04.A;
 - 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 Paragraph 13.03; and,

- c. 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.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a 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 otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent 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 do not warrant or guarantee 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 information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then 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 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Possible Price and Times Adjustments:*
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - 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 Paragraph 13.03;
 - c. 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; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 *Hazardous Environmental Conditions at Site*

- A. *Reports and Drawings*: The Supplementary Conditions identify:
1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on 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 removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) 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 permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. 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, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. 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, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. 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 (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. 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 failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, 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. 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 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.
- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond 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 the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then 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 bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is

maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, 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.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 *Contractor's Insurance*

- A. *Workers' Compensation:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).

4. Foreign voluntary worker compensation (if applicable).
- B. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 2. claims for damages insured by reasonably available personal injury liability coverage.
 3. 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.
- C. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Broad form property damage coverage.
 4. Severability of interest.
 5. Underground, explosion, and collapse coverage.
 6. Personal injury coverage.
 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability:* Contractor shall purchase and maintain automobile liability insurance against 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. The automobile liability policy shall be written on an occurrence basis.
- E. *Umbrella or excess liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result

of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

- G. *Additional insureds*: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, 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 (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.
- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
1. include at least the specific coverages provided in this Article.
 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 5. be appropriate for the Work being performed and provide protection from claims that 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.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, 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.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

6.05 *Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable 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 Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 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; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; 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. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.
 - 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
 - 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
 6. extend to cover damage or loss to insured property while in transit.
 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
 10. not include a co-insurance clause.
 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
 12. include performance/hot testing and start-up.
 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change:* All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.
- C. *Deductibles:* The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner:* If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance:* If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property:* If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 *Waiver of Rights*

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, 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 insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the 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 Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, 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 or Contractor as trustee or fiduciary, 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 occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.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, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.
- D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, 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 builder's risk insurance and any other property insurance applicable to the Work.

6.07 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the

policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

7.01 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.
- 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.

7.02 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, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.03 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, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work 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.

7.04 "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 Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item 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 is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that 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, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, 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;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - 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.
- B. *Contractor's Expense:* Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

- D. *Effect of Engineer's Determination:* Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request:* If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 *Substitutes*

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. 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:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) 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
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from that specified, and

- 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
 - C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
 - D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. 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.
 - E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
 - F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.

7.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
- B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. 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.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. 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.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

- O. 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 money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 *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 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.

7.08 *Permits*

- A. Unless otherwise provided in the Contract Documents, 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 the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *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.

7.10 *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 or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and 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 such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

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

7.12 *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, other work in progress, 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 Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
 - 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 7.12.A.2 or 7.12.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 at its expense (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 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 protection 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 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
 - G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 *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.

7.14 *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.

7.15 *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.

7.16 *Shop Drawings, Samples, and Other Submittals*

A. *Shop Drawing and Sample Submittal Requirements:*

1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the 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 and equipment 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 of that submittal, and that Contractor approves the 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 set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Contractor shall submit the number of copies required in the Specifications.
- 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 7.16.D.

2. *Samples:*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall 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 7.16.D.
 3. 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. *Other Submittals:* Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- 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 or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample 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 7.16.A.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 will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

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.
2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 *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 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;
 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;
 6. the issuance of a notice of acceptability by Engineer;
 7. any inspection, test, or approval by others; or
 8. any correction of defective Work by Owner.

- D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, 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 7.18.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 7.18.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.

7.19 *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 Laws and Regulations.
- 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, 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, 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 7.16.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. 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.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, 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.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner for whom the Owner is responsible causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. 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.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) 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 any such claims, and against all 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 damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

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

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.

9.03 *Furnish Data*

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

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *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 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.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *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 (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- 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.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *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.

10.02 *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 10.08. 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.

10.03 *Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. 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.

10.04 *Rejecting Defective Work*

- A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 *Shop Drawings, Change Orders and Payments*

- A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
- B. 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, are set forth in Paragraph 7.19.
- C. Engineer's authority as to Change Orders is set forth in Article 11.
- D. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.06 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

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

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, 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 15.06.A will only be to determine generally that their content complies with the requirements of, 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 10.08 shall also apply to the Resident Project Representative, if any.

10.09 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

11.01 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. *Change Orders:*
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.
 - 2. *Work Change Directives:* A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an

adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes 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. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 *Owner-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. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.03 *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, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
- B. 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, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or
 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on

the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).

- C. *Contractor's Fee*: When applicable, 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 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.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 11.04.C.2.a and 11.04.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - 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 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.

11.06 *Change Proposals*

- A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under

the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. *Procedures:* Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
 2. *Engineer's Action:* Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
 3. *Binding Decision:* Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. 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;
 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08 *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.

ARTICLE 12 – CLAIMS

12.01 *Claims*

- A. *Claims Process:* The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim:* The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation:*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim

submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work 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 13.01.C, 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, and 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 13.01.
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 6.05), 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 communication 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 that Contractor is required by the Contract Documents to purchase and maintain.

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

- 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, expeditors, 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 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here 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 Paragraph 13.01.B.

D. *Contractor's Fee*: When the Work as a whole 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, Change Proposal, Claim, set-off, or other 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 11.04.C.

E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, 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.

13.02 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*: Contractor agrees that:
 - 1. 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
 - 2. 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 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*: 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.

13.03 *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. Payments to Contractor for Unit Price Work will be based on actual quantities.
- 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. 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 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 the following paragraph.
- E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price 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;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it 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 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction 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.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.
- 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, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. 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. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to

cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages 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. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then 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, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages 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 pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. 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, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *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, then 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.

14.07 *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, 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, then 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 14.07, 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, 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 incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. 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.

- 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 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 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 during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *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, a warehouse bond, 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.
- C. *Review of Applications:*
1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, 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 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 13.03, 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; 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 money 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 15.01.C.2.
 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

- e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due:*

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

E. *Reductions in Payment by Owner:*

- 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. the Contract Price has been reduced by Change Orders;
 - i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
 - j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. 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;
 - l. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, 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, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

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 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 *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 and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
- 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 preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. 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 punch list.

15.04 *Partial Use or Occupancy*

- 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:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be 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 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work 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 15.03 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 6.05 regarding builder's risk or other property insurance.

15.05 *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, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *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, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) 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, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

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 have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. 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 15.07. 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. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.

D. *Payment Becomes Due:* Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation,

including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 *Waiver of Claims*

- A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 *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 Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 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 to 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. 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 correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).
- 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, 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 are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 *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 written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and 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);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, 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 complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.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 the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses,

and damages exceeds 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.

- F. 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, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *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; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) 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 16.03.
- 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 are not intended to preclude Contractor from submitting a Change Proposal 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 17 – FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

18.01 *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, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract 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.

18.03 *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. 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.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

**SUPPLEMENTARY CONDITIONS
SECTION 00 73 00**

PART 1 – GENERAL

These Supplementary Conditions amend or supplement the "Standard General Conditions of the Construction Contract" (EJCDC C-700 (Rev.1), 2013 Edition) All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.04 CONTRACTOR MAY STOP WORK OR TERMINATE

Delete Section 16.04 in its entirety.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

Delete 17 in its entirety.

--END OF SECTION--

WAGE RATE REQUIREMENTS

SECTION 00 73 43

1. GENERAL

- A. CONTRACTOR and Subcontractors shall pay wages not less than the prevailing hourly wage rate for each classification of employee engaged on the Work as determined by the United States Department of Labor and by the State of Illinois Department of Labor. In case of conflict, the wages paid by CONTRACTOR shall be not less than the higher of the prevailing wage determination.
- B. CONTRACTOR shall comply with the provisions of Wages of Employees on Public Works (Prevailing Wage] Act (820 ILCS 130/.01 - 12).
- C. The prevailing wage law does not prohibit payment of more than the prevailing rate of wages nor does it limit the hours of Work which may be performed by any employee in any particular period of time.
- D. A copy of the wage determination shall be posted by CONTRACTOR in a prominent place at the Site of the Work where it can be easily seen by the employees.
- E. If at the time the Contract is executed, or if during the term of the Contract, there is excessive unemployment in Illinois as defined in the Employment of Illinois Workers on Public Works Act, 30 ILCS 570-0.01 *et seq.*, as two consecutive months of unemployment exceeding 5%, the Contractor agrees to employ Illinois laborers as stipulated by the Act. An "Illinois laborer" is defined as any person who has resided in Illinois for at least thirty (30) days and intends to become or remain an Illinois resident.

2. WAGE DETERMINATIONS

- A. The following wage rate schedule(s) are the prevailing rate(s) of hourly wage applicable to this Contract.

If the Department of Labor revises the prevailing rate of hourly wages to be paid by the public body, the revised rate as provided by the public body shall apply to this Contract.

Cook County Prevailing Wage Rates posted on 12/16/2019

Trade Title	Rg	Type	C	Base	Foreman	Overtime				H/W	Pension	Vac	Trng	Other Ins
						M-F	Sa	Su	Hol					
ASBESTOS ABT-GEN	AII	ALL		43.72	44.72	1.5	1.5	2.0	2.0	14.99	13.61	0.00	0.90	
ASBESTOS ABT-MEC	AII	BLD		37.88	40.38	1.5	1.5	2.0	2.0	13.42	12.20	0.00	0.72	
BOILERMAKER	AII	BLD		50.51	55.05	2.0	2.0	2.0	2.0	6.97	14.65	0.00	1.10	
BRICK MASON	AII	BLD		46.88	51.57	1.5	1.5	2.0	2.0	10.85	19.31	0.00	0.95	
CARPENTER	AII	ALL		48.55	50.55	1.5	1.5	2.0	2.0	11.79	21.84	0.00	0.73	
CEMENT MASON	AII	ALL		46.25	48.25	2.0	1.5	2.0	2.0	14.50	19.04	0.00	1.25	
CERAMIC TILE FINISHER	AII	BLD		40.56	40.56	1.5	1.5	2.0	2.0	11.00	12.80	0.00	0.86	
COMMUNICATION ELECTRICIAN	AII	BLD		44.86	47.66	1.5	1.5	2.0	2.0	10.22	13.48	1.25	1.15	0.07
ELECTRIC PWR EQMT OP	AII	ALL		53.40	58.40	1.5	1.5	2.0	2.0	12.36	17.72	0.00	3.39	
ELECTRIC PWR GRNDMAN	AII	ALL		41.65	58.40	1.5	1.5	2.0	2.0	9.64	13.82	0.00	2.65	
ELECTRIC PWR LINEMAN	AII	ALL		53.40	58.40	1.5	1.5	2.0	2.0	12.36	17.72	0.00	3.39	
ELECTRICIAN	AII	ALL		49.35	52.35	1.5	1.5	2.0	2.0	15.69	17.02	1.25	1.48	0.40
ELEVATOR CONSTRUCTOR	AII	BLD		56.61	63.69	2.0	2.0	2.0	2.0	15.58	17.51	4.53	0.62	
FENCE ERECTOR	AII	ALL		42.88	44.88	1.5	1.5	2.0	2.0	13.64	14.89	0.00	0.65	
GLAZIER	AII	BLD		44.85	46.35	1.5	2.0	2.0	2.0	14.49	22.29	0.00	0.94	
HEAT/FROST INSULATOR	AII	BLD		50.50	53.00	1.5	1.5	2.0	2.0	13.42	13.66	0.00	0.72	
IRON WORKER	AII	ALL		50.63	52.63	2.0	2.0	2.0	2.0	14.65	23.78	0.00	0.44	
LABORER	AII	ALL		43.72	44.47	1.5	1.5	2.0	2.0	14.99	13.61	0.00	0.90	
LATHER	AII	ALL		48.55	50.55	1.5	1.5	2.0	2.0	11.79	21.84	0.00	0.73	
MACHINIST	AII	BLD		48.93	51.43	1.5	1.5	2.0	2.0	7.68	8.95	1.85	1.32	
MARBLE FINISHER	AII	ALL		35.15	48.33	1.5	1.5	2.0	2.0	10.85	17.66	0.00	0.52	
MARBLE MASON	AII	BLD		46.03	50.63	1.5	1.5	2.0	2.0	10.85	18.78	0.00	0.64	
MATERIAL TESTER I	AII	ALL		33.72		1.5	1.5	2.0	2.0	14.99	13.61	0.00	0.90	
MATERIALS TESTER II	AII	ALL		38.72		1.5	1.5	2.0	2.0	14.99	13.61	0.00	0.90	
MILLWRIGHT	AII	ALL		48.55	50.55	1.5	1.5	2.0	2.0	11.79	21.84	0.00	0.73	
OPERATING ENGINEER	AII	BLD	1	51.10	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	BLD	2	49.80	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	BLD	3	47.25	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	BLD	4	45.50	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	BLD	5	54.85	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	BLD	6	52.10	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	

Cook County Prevailing Wage Rates posted on 12/16/2019

Trade Title	Rg	Type	C	Base	Foreman	Overtime				H/W	Pension	Vac	Trng	Other Ins
						M-F	Sa	Su	Hol					
OPERATING ENGINEER	AII	BLD	7	54.10	55.10	2.0	2.0	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	FLT	1	58.20	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	FLT	2	56.70	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	FLT	3	50.45	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	FLT	4	41.95	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	FLT	5	59.70	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	FLT	6	38.00	58.20	1.5	1.5	2.0	2.0	19.65	15.10	2.00	1.40	
OPERATING ENGINEER	AII	HWY	1	49.30	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	2	48.75	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	3	46.70	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	4	45.30	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	5	44.10	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	6	52.30	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
OPERATING ENGINEER	AII	HWY	7	50.30	53.30	1.5	1.5	2.0	2.0	20.50	16.85	2.00	1.65	
ORNAMENTAL IRON WORKER	AII	ALL		50.05	52.55	2.0	2.0	2.0	2.0	14.14	21.13	0.00	1.25	
PAINTER	AII	ALL		47.30	53.21	1.5	1.5	1.5	2.0	12.01	12.74	0.00	1.87	
PAINTER - SIGNS	AII	BLD		39.06	43.86	1.5	1.5	2.0	2.0	2.67	3.32	0.00	0.00	
PILEDRIIVER	AII	ALL		48.55	50.55	1.5	1.5	2.0	2.0	11.79	21.84	0.00	0.73	
PIPEFITTER	AII	BLD		49.60	52.60	1.5	1.5	2.0	2.0	10.75	19.85	0.00	2.67	
PLASTERER	AII	BLD		44.50	47.17	1.5	1.5	2.0	2.0	14.50	17.29	0.00	1.50	
PLUMBER	AII	BLD		51.00	54.05	1.5	1.5	2.0	2.0	15.37	14.75	0.00	1.35	
ROOFER	AII	BLD		44.60	48.60	1.5	1.5	2.0	2.0	10.58	13.31	0.00	0.70	
SHEETMETAL WORKER	AII	BLD		45.50	49.14	1.5	1.5	2.0	2.0	11.70	25.58	0.00	0.86	
SIGN HANGER	AII	BLD		32.68	35.29	1.5	1.5	2.0	2.0	5.40	3.75	0.00	0.00	
SPRINKLER FITTER	AII	BLD		50.15	52.65	1.5	1.5	2.0	2.0	13.50	16.60	0.00	0.65	
STEEL ERECTOR	AII	ALL		42.07	44.07	2.0	2.0	2.0	2.0	13.45	19.59	0.00	0.35	
STONE MASON	AII	BLD		46.88	51.57	1.5	1.5	2.0	2.0	10.85	19.31	0.00	0.95	
TERRAZZO FINISHER	AII	BLD		42.54	42.54	1.5	1.5	2.0	2.0	11.00	14.64	0.00	0.88	
TERRAZZO MASON	AII	BLD		46.38	49.88	1.5	1.5	2.0	2.0	11.00	16.09	0.00	0.93	
TILE MASON	AII	BLD		47.50	51.50	1.5	1.5	2.0	2.0	11.00	16.06	0.00	0.93	
TRAFFIC SAFETY WORKER	AII	HWY		37.75	39.35	1.5	1.5	2.0	2.0	9.30	9.87	0.00	0.30	
TRUCK DRIVER	E	ALL	1	36.45	37.10	1.5	1.5	2.0	2.0	9.68	13.25	0.00	0.15	
TRUCK DRIVER	E	ALL	2	36.70	37.10	1.5	1.5	2.0	2.0	9.68	13.25	0.00	0.15	
TRUCK DRIVER	E	ALL	3	36.90	37.10	1.5	1.5	2.0	2.0	9.68	13.25	0.00	0.15	
TRUCK DRIVER	E	ALL	4	37.10	37.10	1.5	1.5	2.0	2.0	9.68	13.25	0.00	0.15	
TRUCK DRIVER	W	ALL	1	37.36	37.91	1.5	1.5	2.0	2.0	9.00	11.64	0.00	0.15	

Cook County Prevailing Wage Rates posted on 7/15/2019

Trade Title	Rg	Type	C	Base	Foreman	Overtime				H/W	Pension	Vac	Trng	Other Ins
						M-F	Sa	Su	Hol					
TRUCK DRIVER	W	ALL	2	37.51	37.91	1.5	1.5	2.0	2.0	9.00	11.64	0.00	0.15	
TRUCK DRIVER	W	ALL	3	37.71	37.91	1.5	1.5	2.0	2.0	9.00	11.64	0.00	0.15	
TRUCK DRIVER	W	ALL	4	37.91	37.91	1.5	1.5	2.0	2.0	9.00	11.64	0.00	0.15	
TUCKPOINTER	All	BLD		46.50	47.50	1.5	1.5	2.0	2.0	8.34	18.40	0.00	0.93	

Legend

Rg Region

Type Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers

C Class

Base Base Wage Rate

OT M-F Unless otherwise noted, OT pay is required for any hour greater than 8 worked each day, Mon through Fri. The number listed is the multiple of the base wage.

OT Sa Overtime pay required for every hour worked on Saturdays

OT Su Overtime pay required for every hour worked on Sundays

OT Hol Overtime pay required for every hour worked on Holidays

H/W Health/Welfare benefit

Vac Vacation

Trng Training

Other Ins Employer hourly cost for any other type(s) of insurance provided for benefit of worker.

Explanations COOK COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

TRUCK DRIVERS (WEST) - That part of the county West of Barrington Road.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date. ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER

The grouting, cleaning, and polishing of all classes of tile, whether for interior or exterior purposes, all burned, glazed or unglazed products; all composition materials, granite tiles, warning detectable tiles, cement tiles, epoxy composite materials, pavers, glass, mosaics, fiberglass, and all substitute materials, for tile made in tile-like units; all mixtures in tile like form of cement, metals, and other materials that are for and intended for use as a finished floor surface, stair treads, promenade roofs, walks, walls, ceilings, swimming pools, and all other places where tile is to form a finished interior or exterior. The mixing of all setting mortars including but not limited to thin-set mortars, epoxies, wall mud, and any other sand and cement mixtures or adhesives when used in the preparation, installation, repair, or maintenance of tile and/or similar materials. The handling and unloading of all

sand, cement, lime, tile, fixtures, equipment, adhesives, or any other materials to be used in the preparation, installation, repair, or maintenance of tile and/or similar materials. Ceramic Tile Finishers shall fill all joints and voids regardless of method on all tile work, particularly and especially after installation of said tile work. Application of any and all protective coverings to all types of tile installations including, but not be limited to, all soap compounds, paper products, tapes, and all polyethylene coverings, plywood, masonite, cardboard, and any new type of products that may be used to protect tile installations, Blastrac equipment, and all floor scarifying equipment used in preparing floors to receive tile. The clean up and removal of all waste and materials. All demolition of existing tile floors and walls to be re-tiled.

COMMUNICATIONS ELECTRICIAN

Installation, operation, inspection, maintenance, repair and service of radio, television, recording, voice sound vision production and reproduction, telephone and telephone interconnect, facsimile, data apparatus, coaxial, fibre optic and wireless equipment, appliances and systems used for the transmission and reception of signals of any nature, business, domestic, commercial, education, entertainment, and residential purposes, including but not limited to, communication and telephone, electronic and sound equipment, fibre optic and data communication systems, and the performance of any task directly related to such installation or service whether at new or existing sites, such tasks to include the placing of wire and cable and electrical power conduit or other raceway work within the equipment room and pulling wire and/or cable through conduit and the installation of any incidental conduit, such that the employees covered hereby can complete any job in full.

MARBLE FINISHER

Loading and unloading trucks, distribution of all materials (all stone, sand, etc.), stocking of floors with material, performing all rigging for heavy work, the handling of all material that may be needed for the installation of such materials, building of scaffolding, polishing if needed, patching, waxing of material if damaged, pointing up, caulking, grouting and cleaning of marble, holding water on diamond or Carborundum blade or saw for setters cutting, use of tub saw or any other saw needed for preparation of material, drilling of holes for wires that anchor material set by setters, mixing up of molding plaster for installation of material, mixing up thin set for the installation of material, mixing up of sand to cement for the installation of material and such other work as may be required in helping a Marble Setter in the handling of all material in the erection or installation of interior marble, slate, travertine, art marble, serpentine, alberene stone, blue stone, granite and other stones (meaning as to stone any foreign or domestic materials as are specified and used in building interiors and exteriors and customarily known as stone in the trade), carrara, sanionyx, vitrolite and similar opaque glass and the laying of all marble tile, terrazzo tile, slate tile and precast tile, steps, risers treads, base, or any other materials that may be used as substitutes for any of the aforementioned materials and which are used on interior and exterior which are installed in a similar manner.

MATERIAL TESTER I: Hand coring and drilling for testing of materials; field inspection of uncured concrete and asphalt.

MATERIAL TESTER II: Field inspection of welds, structural steel, fireproofing, masonry, soil, facade, reinforcing steel, formwork, cured concrete, and concrete and asphalt batch plants; adjusting proportions of bituminous mixtures.

OPERATING ENGINEER - BUILDING

Class 1. Asphalt Plant; Asphalt Spreader; Autograde; Backhoes with Caisson Attachment; Batch Plant; Benoto (requires Two Engineers); Boiler and Throttle Valve; Caisson Rigs; Central Redi-Mix Plant; Combination Back Hoe Front End-loader Machine; Compressor and Throttle Valve; Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Conveyor (Truck Mounted); Concrete Paver Over 27E cu. ft; Concrete Paver 27E cu. ft. and Under; Concrete Placer; Concrete Placing Boom; Concrete Pump (Truck Mounted); Concrete Tower; Cranes, All; Cranes, Hammerhead; Cranes, (GCI and similar Type); Creter Crane; Spider Crane; Crusher, Stone, etc.; Derricks, All; Derricks, Traveling; Formless Curb and Gutter Machine; Grader, Elevating; Grouting Machines; Heavy Duty Self-Propelled Transporter or Prime Mover; Highlift Shovels or Front Endloader 2-1/4 yd. and over; Hoists, Elevators, outside type rack and pinion and similar machines; Hoists, One, Two and Three Drum; Hoists, Two Tugger One Floor; Hydraulic Backhoes; Hydraulic Boom Trucks; Hydro Vac (and similar equipment); Locomotives, All; Motor Patrol; Lubrication Technician;

Manipulators; Pile Drivers and Skid Rig; Post Hole Digger; Pre-Stress Machine; Pump Cretes Dual Ram; Pump Cretes: Squeeze Cretes-Screw Type Pumps; Gypsum Bulker and Pump; Raised and Blind Hole Drill; Roto Mill Grinder; Scoops - Tractor Drawn; Slip-Form Paver; Straddle Buggies; Operation of Tie Back Machine; Tournapull; Tractor with Boom and Side Boom; Trenching Machines.

Class 2. Boilers; Broom, All Power Propelled; Bulldozers; Concrete Mixer (Two Bag and Over); Conveyor, Portable; Forklift Trucks; Highlift Shovels or Front Endloaders under 2-1/4 yd.; Hoists, Automatic; Hoists, Inside Elevators; Hoists, Sewer Dragging Machine; Hoists, Tugger Single Drum; Laser Screed; Rock Drill (Self-Propelled); Rock Drill (Truck Mounted); Rollers, All; Steam Generators; Tractors, All; Tractor Drawn Vibratory Roller; Winch Trucks with "A" Frame.

Class 3. Air Compressor; Combination Small Equipment Operator; Generators; Heaters, Mechanical; Hoists, Inside Elevators (remodeling or renovation work); Hydraulic Power Units (Pile Driving, Extracting, and Drilling); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Low Boys; Pumps, Well Points; Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 4. Bobcats and/or other Skid Steer Loaders; Oilers; and Brick Forklift.

Class 5. Assistant Craft Foreman.

Class 6. Gradall.

Class 7. Mechanics; Welders.

OPERATING ENGINEERS - HIGHWAY CONSTRUCTION

Class 1. Asphalt Plant; Asphalt Heater and Planer Combination; Asphalt Heater Scarfire; Asphalt Spreader; Autograder/GOMACO or other similar type machines; ABG Paver; Backhoes with Caisson Attachment; Ballast Regulator; Belt Loader; Caisson Rigs; Car Dumper; Central Redi-Mix Plant; Combination Backhoe Front Endloader Machine, (1 cu. yd. Backhoe Bucket or over or with attachments); Concrete Breaker (Truck Mounted); Concrete Conveyor; Concrete Paver over 27E cu. ft.; Concrete Placer; Concrete Tube Float; Cranes, all attachments; Cranes, Tower Cranes of all types: Creter Crane: Spider Crane; Crusher, Stone, etc.; Derricks, All; Derrick Boats; Derricks, Traveling; Dredges; Elevators, Outside type Rack & Pinion and Similar Machines; Formless Curb and Gutter Machine; Grader, Elevating; Grader, Motor Grader, Motor Patrol, Auto Patrol, Form Grader, Pull Grader, Subgrader; Guard Rail Post Driver Truck Mounted; Hoists, One, Two and Three Drum; Heavy Duty Self-Propelled Transporter or Prime Mover; Hydraulic Backhoes; Backhoes with shear attachments up to 40' of boom reach; Lubrication Technician; Manipulators; Mucking Machine; Pile Drivers and Skid Rig; Pre-Stress Machine; Pump Cretes Dual Ram; Rock Drill - Crawler or Skid Rig; Rock Drill - Truck Mounted; Rock/Track Tamper; Roto Mill Grinder; Slip-Form Paver; Snow Melters; Soil Test Drill Rig (Truck Mounted); Straddle Buggies; Hydraulic Telescoping Form (Tunnel); Operation of Tieback Machine; Tractor Drawn Belt Loader; Tractor Drawn Belt Loader (with attached pusher - two engineers); Tractor with Boom; Tractaire with Attachments; Traffic Barrier Transfer Machine; Trenching; Truck Mounted Concrete Pump with Boom; Raised or Blind Hole Drills (Tunnel Shaft); Underground Boring and/or Mining Machines 5 ft. in diameter and over tunnel, etc; Underground Boring and/or Mining Machines under 5 ft. in diameter; Wheel Excavator; Widener (APSCO).

Class 2. Batch Plant; Bituminous Mixer; Boiler and Throttle Valve; Bulldozers; Car Loader Trailing Conveyors; Combination Backhoe Front Endloader Machine (Less than 1 cu. yd. Backhoe Bucket or over or with attachments); Compressor and Throttle Valve; Compressor, Common Receiver (3); Concrete Breaker or Hydro Hammer; Concrete Grinding Machine; Concrete Mixer or Paver 7S Series to and including 27 cu. ft.; Concrete Spreader; Concrete Curing Machine, Burlap Machine, Belting Machine and Sealing Machine; Concrete Wheel Saw; Conveyor Muck Cars (Haglund or Similar Type); Drills, All; Finishing Machine - Concrete; Highlift Shovels or Front Endloader; Hoist - Sewer Dragging Machine; Hydraulic Boom Trucks (All Attachments); Hydro-Blaster; Hydro Excavating (excluding hose work); Laser Screed; All Locomotives, Dinky; Off-Road Hauling Units (including articulating) Non Self-Loading Ejection Dump; Pump Cretes: Squeeze Cretes - Screw Type Pumps, Gypsum Bulker and Pump; Roller, Asphalt; Rotary Snow Plows; Rototiller, Seaman, etc., self-propelled; Self-Propelled Compactor; Spreader - Chip - Stone, etc.; Scraper - Single/Twin

Engine/Push and Pull; Scraper - Prime Mover in Tandem (Regardless of Size); Tractors pulling attachments, Sheeps Foot, Disc, Compactor, etc.; Tug Boats.

Class 3. Boilers; Brooms, All Power Propelled; Cement Supply Tender; Compressor, Common Receiver (2); Concrete Mixer (Two Bag and Over); Conveyor, Portable; Farm-Type Tractors Used for Mowing, Seeding, etc.; Forklift Trucks; Grouting Machine; Hoists, Automatic; Hoists, All Elevators; Hoists, Tugger Single Drum; Jeep Diggers; Low Boys; Pipe Jacking Machines; Post-Hole Digger; Power Saw, Concrete Power Driven; Pug Mills; Rollers, other than Asphalt; Seed and Straw Blower; Steam Generators; Stump Machine; Winch Trucks with "A" Frame; Work Boats; Tamper-Form-Motor Driven.

Class 4. Air Compressor; Combination - Small Equipment Operator; Directional Boring Machine; Generators; Heaters, Mechanical; Hydraulic Power Unit (Pile Driving, Extracting, or Drilling); Light Plants, All (1 through 5); Pumps, over 3" (1 to 3 not to exceed a total of 300 ft.); Pumps, Well Points; Vacuum Trucks (excluding hose work); Welding Machines (2 through 5); Winches, 4 Small Electric Drill Winches.

Class 5. SkidSteer Loader (all); Brick Forklifts; Oilers.

Class 6. Field Mechanics and Field Welders

Class 7. Dowell Machine with Air Compressor; Gradall and machines of like nature.

OPERATING ENGINEER - FLOATING

Class 1. Craft Foreman; Master Mechanic; Diver/Wet Tender; Engineer; Engineer (Hydraulic Dredge).

Class 2. Crane/Backhoe Operator; Boat Operator with towing endorsement; Mechanic/Welder; Assistant Engineer (Hydraulic Dredge); Leverman (Hydraulic Dredge); Diver Tender.

Class 3. Deck Equipment Operator, Machineryman, Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 lbs. or more); Tug/Launch Operator; Loader/Dozer and like equipment on Barge, Breakwater Wall, Slip/Dock, or Scow, Deck Machinery, etc.

Class 4. Deck Equipment Operator, Machineryman/Fireman (4 Equipment Units or More); Off Road Trucks; Deck Hand, Tug Engineer, Crane Maintenance (50 Ton Capacity and Under) or Backhoe Weighing (115,000 pounds or less); Assistant Tug Operator.

Class 5. Friction or Lattice Boom Cranes.

Class 6. ROV Pilot, ROV Tender

TERRAZZO FINISHER

The handling of sand, cement, marble chips, and all other materials that may be used by the Mosaic Terrazzo Mechanic, and the mixing, grinding, grouting, cleaning and sealing of all Marble, Mosaic, and Terrazzo work, floors, base, stairs, and wainscoting by hand or machine, and in addition, assisting and aiding Marble, Masonic, and Terrazzo Mechanics.

TRAFFIC SAFETY

Effective November 30, 2018, the description of the traffic safety worker trade in this County is as follows: Work associated with barricades, horses and drums used to reduce lane usage on highway work, the installation and removal of temporary, non-temporary or permanent lane, pavement or roadway markings, and the installation and removal of temporary road signs.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION - EAST & WEST

Class 1. Two or three Axle Trucks. A-frame Truck when used for transportation purposes; Air Compressors and Welding Machines, including those pulled by cars, pick-up trucks and tractors; Ambulances; Batch Gate Lockers; Batch Hopperman; Car and Truck Washers; Carry-alls; Fork Lifts and Hoisters; Helpers; Mechanics Helpers and Greasers; Oil Distributors 2-man operation; Pavement Breakers; Pole Trailer, up to 40 feet; Power Mower Tractors; Self-propelled Chip Spreader; Skipman; Slurry Trucks, 2-man operation; Slurry Truck Conveyor Operation, 2 or 3 man; Teamsters; Unskilled Dumpman; and Truck Drivers hauling warning lights, barricades, and portable toilets on the job site.

Class 2. Four axle trucks; Dump Crets and Adgetors under 7 yards; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turnpulls or Turntrailers when pulling other than self-loading equipment or similar equipment under 16 cubic yards; Mixer Trucks under 7 yards; Ready-mix Plant Hopper Operator, and Winch Trucks, 2 Axles.

Class 3. Five axle trucks; Dump Crets and Adgetors 7 yards and over; Dumpsters, Track Trucks, Euclids, Hug Bottom Dump Turntrailers or turnpulls when pulling other than self-loading equipment or similar equipment over 16 cubic yards; Explosives and/or Fission Material Trucks; Mixer Trucks 7 yards or over; Mobile Cranes while in transit; Oil Distributors, 1-man operation; Pole Trailer, over 40 feet; Pole and Expandable Trailers hauling material over 50 feet long; Slurry trucks, 1-man operation; Winch trucks, 3 axles or more; Mechanic--Truck Welder and Truck Painter.

Class 4. Six axle trucks; Dual-purpose vehicles, such as mounted crane trucks with hoist and accessories; Foreman; Master Mechanic; Self-loading equipment like P.B. and trucks with scoops on the front.

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

MATERIAL TESTER & MATERIAL TESTER/INSPECTOR I AND II

Notwithstanding the difference in the classification title, the classification entitled "Material Tester I" involves the same job duties as the classification entitled "Material Tester/Inspector I". Likewise, the classification entitled "Material Tester II" involves the same job duties as the classification entitled "Material Tester/Inspector II".

--END OF SECTION--

DRAWINGS
SECTION 00 80 00

The following Drawings shall be made part of these Bidding Documents and shall form a basis for the Contract Price.

<u>SHEET NO.</u>	<u>DRAWING TITLE</u>
1	Cover Sheet
2	Legend and General Notes
3	MWRD and Maintenance Notes
4	Existing Condition and Demolition Plan
5	Proposed Lift Station Plan and Details
6	Electrical Site Plan and Schedule
7	One Line Diagram and Electrical Details
8-10	Miscellaneous Details
11-12	IDOT Details

If awarded the Contract and before starting Work, Contractor shall field verify for accuracy all Drawings pertinent to this project and conditions as noted thereon. Any discrepancies found shall be brought to the attention of the Owner immediately. If such discrepancies will result in changes to Contractor's prices, these changes shall be discussed with the Owner and executed before Contractor starts Work. The Owner will not accept any changes in Contract Price after start of Work which may or may not be due to any discrepancy in any Drawing.

--END OF SECTION--

**SUMMARY OF WORK
SECTION 01 10 00**

PART 1 – GENERAL

1.01 LOCATION OF WORK:

- A. The location of the project is located on the north side of Weidner Road, east of Stradford Circle and north of Dundee Parkway in Buffalo Grove, IL 60089. The existing lift station is located on Village property adjacent to the public right of way, in front of Lions Park.
- B. The limits of the project location is constrained to the public right of way and the existing Village property as shown on the plans. Any construction easements or staging areas required by the Contractor (other than those shown on the Drawings) shall be the responsibility of the Contractor. Any specialized machinery and / or equipment due to the limited site constraints and type of work to be performed, shall be the responsibility of the Contractor.

1.02 SCOPE OF WORK:

- A. Furnish all labor, materials, equipment and incidentals necessary and make conversion / upgrade of Chatham Lift Station complete and ready for operation as shown on the Drawings and specified herein.
- B. The work includes, but is not necessarily limited to, the following major items:
 - 1. Chatham Lift Station
 - a. Selective demolition of existing can-type pump station.
 - b. Construction of new wet well with duplex submersible pump operation including new wet well top with access hatch.
 - c. Installation of new submersible solids handling pumps with constant speed drives and controls.
 - d. Dewatering
 - e. Associated electrical and instrumentation work.
 - f. New valve / meter / bypass vault.
 - g. Repurposing of existing wet well.

- h. New traffic box control panel.
- i. New electrical service.
- j. New diesel engine generator.
- k. Contractor bypass pumping as needed.
- l. Concrete generator and control panel pads.
- m. New asphalt driveway.
- n. Concrete restoration.
- o. Site grading and landscape restoration.

1.03 WORK SEQUENCE:

- A. Duties of the existing lift station must be maintained using the existing lift station or via bypass pumping throughout the duration of the project. The Contractor will be responsible for the sequence of construction and continuous operation of the lift stations throughout the project. The proposed sequence shall be in accordance with the schedule submitted by the Contractor, and approved by the Owner.

1.04 CONTRACTOR'S USE OF PREMISES:

- A. Contractor shall limit the use of the premises for the performance of the Work and storage of materials and equipment to allow for the Owner's use in operating and maintaining the pump station.
- B. Contractor shall coordinate with the Owner necessary access for normal maintenance requirements.
- C. Contractor shall assume full responsibility for security of all his and his subcontractors materials and equipment stored on the site.
- D. If directed by the Owner, Contractor shall move any stored items which interfere with operations of the Owner or the convenience of the public.
- E. Obtain and pay for use of additional storage or work areas if needed to perform the Work.
- F. Noise: The Contractor is specifically advised that the project site is located in close proximity to existing residential properties. Contractor shall employ all

necessary means and methods required to mitigate the noise impacts to the adjacent residents including the use of sound barriers and/or electric driven equipment as necessary to comply with all Village Ordinances. All Contractor equipment shall be equipped with hospital grade silencers as applicable. The Contractor shall prepare a Noise Mitigation Plan for review by the Owner and Engineer.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**PROJECT MEETINGS
SECTION 01 31 19**

PART 1 – GENERAL

1.01 PRECONSTRUCTION CONFERENCE:

- A. The preconstruction conference will be held in accordance with Article 2.04 of the General Conditions this Section.
- B. The Owner or Engineer will set the time and date of the meeting after execution of the contract by both parties.
- C. The following shall be submitted for review at the pre-construction meeting:
 - 1. Progress schedule
 - 2. 24-hour emergency phone number, field phone number, page number, and cellular phone number of the Contractor's superintendent.
 - 3. List of sub-contractors with contact names, addresses, and phone numbers. Also, include quantity and type of work to be sublet.
 - 4. Shop drawings for all items and mix designs for concrete and bituminous items to be installed on the project shall be submitted to the Owner no less than ten (10) calendar days from the effective notice to proceed dated letter or the scheduled date of the pre-construction meeting, whichever occurs earlier. A penalty of \$500 may be imposed for each submittal after that timeframe.
 - 5. List of material suppliers and phone numbers.
- D. Failure to submit the information in 1.01.C at the pre-construction meeting that causes delays in the Engineer's review and approval of the information shall not be grounds for an extension of the project completion date.

1.02 PROGRESS MEETINGS WITH ENGINEER:

- A. General progress meetings shall be held once a week with times coordinated by the Engineer. Require every entity then involved in the planning, coordination or performance of work to be properly represented at each meeting. Include (when applicable) consultants, separate contractors (if any), principal subcontractors, suppliers/manufacturers/fabricators, governing authorities, insurers, special supervisory personnel and others with an interest or expertise in the progress of the work. Review each entity's present and future needs including interface requirements, time, sequence, deliveries, access, site utilization, temporary facilities and services, hours of work, hazards and risks, housekeeping, submittals, change orders, and documentation of information for payment requests. Discuss whether each element of current work is ahead of schedule. Determine how behind-time work will be expedited, and secure commitments from the entities involved in

doing so. Discuss whether schedule revisions are required to ensure that current work and subsequent work will be completed within the Contract Time. Review everything of significance which could affect the progress of the work.

- B. Within seven days after each progress meeting date, the Engineer will forward copies of the minutes-of-the-meeting, to the Contractor.
- C. Immediately following each progress meeting where revisions to the Progress Schedule/Critical Path Schedule have been made or recognized (regardless of whether agreed to by each entity represented), the Contractor shall revise the Schedule and reissue within 10 days after meeting.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

CONSTRUCTION PROGRESS SCHEDULES
SECTION 01 32 16

PART 1 – GENERAL

1.01 DESCRIPTION:

- A. Contractor shall prepare and submit to Engineer for review within 10 days after Notice to Proceed, a construction progress schedule.
- B. The Owner will admit Contractors to the job site during working hours from 7:00 AM to 7:00 PM weekdays. No work will be allowed on Saturdays unless prior approval is granted in writing by the Owner. If work is allowed, it shall be confined to the period beginning at 8:00 AM to 7:00 PM. Any work outside the allowed time periods specified including but not limited to material deliveries, mobilization of equipment, warming up machinery, general deliveries and mobilization of equipment, may incur a penalty of \$1,000 for each occurrence.

1.02 REQUIRED COMPLETION DATES:

- A. Contract Completion Time: All work of this Contract shall be completed **235** consecutive calendar days from the date of the Notice to Proceed.
- B. Substantial Completion: The work of this Contract shall reach substantial completion **220** consecutive calendar days from the date of the Notice to Proceed. Substantial completion of the Work is when the facility is ready for use, but not necessarily including, final check-out, start-up testing, and placing into operation of all equipment is complete.
- C. Final Completion: Final completion shall be defined as the date when equipment start-up has successfully been completed and the equipment has been placed into satisfactory operation. Final completion shall be no later than **15** calendar days after date of Substantial Completion.

1.03 FORM OF SCHEDULES:

- A. Prepare schedules in form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal Time Scale: Identify first work day of each week.
 - 3. Scale and spacing to allow space for notations and future revisions.
- B. Format of Listings: Chronological order of start of each item of work.

C. Identification of Listings: By major specification section numbers.

1.04 CONTENT OF SCHEDULES:

A. Construction Progress Schedule:

1. Show complete sequence of construction by activity.
2. Show dates for beginning and completion of each major element of construction and installation dates for major items of equipment. Elements shall include, but not be limited to the following:
 - a. Shop drawing receipt from supplier/manufacturer submitted to Engineer, review and return to supplier/manufacturer.
 - b. Material and equipment order, manufacturer, delivery, installation, and checkout.
 - c. Performance tests and supervisory services activity.
 - d. Piping, duct work, and wiring installation.
 - e. Construction of various facilities.
 - f. Concrete pour sequence.
 - g. Backfilling, grading, seeding, sodding, landscaping, fence construction, and paving.
 - h. Electrical work activity.
 - i. Mechanical work activity.
 - j. Sewer installation.
 - k. Connection to existing sewers.
 - l. Force main installation.
 - m. Subcontractor's items of work.
 - n. Final cleanup.
 - o. Allowance for inclement weather.
 - p. Demolition.
 - q. Miscellaneous concrete placement.
3. Show projected percentage of completion for each items as of first day of each month.

1.05 SCHEDULE REVISIONS:

- A. Every 28 days, the Contractor shall revise the construction schedule to reflect changes in progress of work.
- B. Indicate progress of each activity at date of submittal.

- C. Show changes occurring since previous submittal of schedule including: Major changes in scope; Activities modified since previous submittal; Revised projections of progress and completion; Other identifiable changes.
 - D. Provide a narrative report as needed to define: Problem areas, anticipated delays, and impact on schedule; Corrective action recommended and its effort; Effect of changes on schedules of other Contractors if applicable.
- 1.06 SUBMITTAL REQUIREMENTS:
- E. For initial submittal of construction schedule and subsequent revisions thereof, furnish six copies of schedule to Engineer.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

SUBMITTALS
SECTION 01 33 00

PART 1 – GENERAL

1.01 SCOPE

- A. This Section establishes minimum requirements and procedures for Submittals by the Contractor for materials and equipment provided for under the Work of this Contract. Specific details for additional drawings, data and information to be submitted shall be in accordance with the applicable requirements of other Sections of these Specifications.

- B. Acceptable Manufacturers and Equipment Suppliers for various items of equipment are specified in respective Sections of these Contract Documents. For convenience of designation in the Contract Documents, certain equipment, articles, materials, and processes are designated by manufacturer trade name or catalog name and number. Such designation shall be deemed to be followed by the words “or approved equal” whether such words are shown or not. The Contractor may offer material or processes which are equal to that so indicated or specified at the time of Bid. The burden of proof as to comparative quality and suitability of alternatives shall be upon the Contractor. After acceptance of Bid, no substitutions will be allowed, except as stated in the Bid. (Exception: Where Specifications indicate “No Substitutions Allowed” the Contractor shall provide the designated manufacturers equipment without exception.)

1.02 SUBMITTAL PROCEDURES

- A. The Contractor shall, within 10 calendar days after receiving the Notice to Proceed, prepare and submit for review a construction schedule together with a detailed list of all the submittals which the Contractor proposes to make to meet the requirements of this and other Sections, including the dates on which the Contractor proposes to make such submittals.

- B. The Contractor shall submit submittals in electronic format. If hard copies are submitted, the Contractor shall submit 3 hard copies of the submittal packages to the Engineer for each submittal iteration if the submittal is provided as a hard copy.

- C. The Engineer will make internal distribution to the Owner and other interested parties.

- D. Submittals shall be in the English language.

- E. Weights, measures, and units shall be English units.

F. Symbols and drawings shall conform to ANSI Y32.2 / IEEE 315/SCA Z99.

1.03 CONTRACTOR RESPONSIBILITIES

- A. Review submittals prior to submission.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance to specifications.
- C. Coordinate each submittal with other submittals and with requirements of Work and of Contract Documents.
- D. Notify Engineer in writing, at time of submission, of any deviations in submittals from requirements of Contract Documents. Any such deviations permitted by Engineer will require modifications of Contract Documents.
- E. Provide space on Shop Drawings for Contractor and Engineer stamps.
- F. When Shop Drawings are revised for resubmission, identify all changes made since previous submission.
- G. Submittals containing language imposing duties on others (such as verification of dimensions or supply of related information) inconsistent with contract language shall be null and void.
- H. Submittals shall not be used as media for inquiries for information or for verification of information that must be supplied by others to Contractor. Inquiries or verification of information shall be made by separate Contractor submittal using Request for Information (RFI) process.
- I. Begin no fabrication or Work which requires submittal review until return of submittals by Engineer with stamp, as either "Furnish as Submitted", or "Furnish as Corrected."
- J. Distribute copies of reviewed submittals that carry Engineer stamp as either "Furnish as Submitted" or "Furnish as Corrected" as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

1.04 ENGINEER DUTIES

- A. Review required submittals within 15 calendar days and in accordance with schedule, only for general conformance to design concept of Project and compliance with information given in Contract Documents. Review shall not extend to means, methods, sequences, techniques, or procedures of construction or to safety precautions or program incident thereto. Review of a separate item as such will not indicated approval of assembly in which item functions.
- B. Affix stamp and initials or signature, and indicate requirements for resubmittal, or review of submittal. Engineer's action on submittals is classified as follows:
1. Furnish as Submitted: Submittal has been reviewed and appears to be in conformance to design concept of Project and Contract Documents. Contractor may proceed with fabrication of work in submittal.
 2. Furnish as Corrected: Submittal has been reviewed and appears to be in conformance to design concept of Project and Contract Documents, except as noted by reviewer. Contractor may proceed with fabrication of work in submittal with modifications and corrections as indicated by reviewer.
 3. Revise and Resubmit: Submittal has been reviewed and appears not to be in conformance to design concept of Project or with Contract Documents. Contractor shall not proceed with fabrication of work in submittal, but instead shall make any corrections required by reviewer and resubmit for review.
 4. Rejected: Submittal is being returned without having been reviewed because: 1) not required by Contract Documents; 2) grossly incomplete; 3) indicates no attempt at conformance to Contract Documents; 4) cannot be reproduced; 5) lacks Contractor's completed approval stamp; or 6) lacks design professional's seal when required by law or Contract Documents. If submittal is required by Contract Documents, Contractor shall not proceed with Work as detailed in submittal, but instead shall correct defects and resubmit for review.
- C. Return one copy of submittals to Contractor. Contractor shall make additional distribution as required.
- D. Submittals which do not contain markup, or which have minor markup that can be adequately described without referencing submittal, will not be

returned. Reviewer will return signed submittal stamp with written description of Review's comments.

- E. Review of submittals shall not relieve Contractor from responsibility for any variation from Contract Documents unless Contractor has, in writing, called Engineer's attention to such variation at time of submission, and Engineer has given written concurrence pursuant to Contract Documents to specific variation, nor shall any concurrence by Engineer or other reviewer relieve Contractor from responsibility for errors or omissions in submittals.

1.05 SHOP DRAWINGS SUBMITTALS

- A. Submit for review for limited purpose of checking for conformance to information given and design concept expressed in Contract Documents. Produce copies and distribute in accordance with article "Submittal Procedures" and for record documents purposes as described in Section 01 33 00.
- B. Designate in construction schedule, or in separate coordinated submittal schedule, dates for submission and dates that reviewed submittals will be needed.
- C. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in Work or in work of other contractors.
- D. Present in clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and like information to enable review of information as required.
- E. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Drawings.
- F. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- G. Equipment which is identified on Contract Documents with tag number or name shall be identified on Shop Drawing with same tag.
- H. Schedule submittals to expedite Project. Coordinate submission of related items.
- I. For each submittal for review, allow 10 calendar days to complete review process.
- J. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

K. Shop Drawings shall be submitted in electronic format.

1. Submit electronic copy to Engineer at project site.
2. Text documents shall be submitted in .pdf format.
3. Drawings shall be submitted in .pdf format.
4. Electronic submittal shall be suitable for reproduction in black and white.
5. Samples may be submitted to Engineer at address given in these documents.

L. Submittals shall contain:

1. Date of submission and dates of any previous submissions.
2. Project title and number.
3. Contract identification.
4. Names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer
5. Identification of product, with Specification section number and article number.
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on resubmittals.
11. An 8" x 3" blank space for Contractor and reviewer stamps.
12. Indication of Contractor's approval, initialed or signed, with wording substantially as follows:

"Contractor represents to Owner and Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or assumes full responsibility for doing so and has reviewed or coordinated each submittal with requirements of Work and Contract Documents."

13. If Contract Documents include performance specifications stating required results which can be verified as meeting stipulated criteria, so that further design by Contractor prior to fabrication is necessary, Submittal depicting such design must be prepared under seal of professional engineer registered licensed in appropriate state and Submittal shall be signed and sealed in accordance with applicable regulations and with following certification statement:

"I hereby certify that this engineering document was prepared by me or under my direct personal supervision, that I am a duly registered licensed professional engineer under laws of state of Illinois and I accept responsibility for adequacy of this document to meet criteria stipulated in Contract Documents."

M. Product Data:

1. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
2. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

N. Design Data:

1. Submit for Engineer's knowledge as contract administrator or for Owner.
2. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

O. Data sheets:

1. Data sheets may require information not known until Contractor's engineering is complete. Furnish estimated values based on good engineering judgment. Estimated values shall be identified by placement of "(est.)" next to value.
2. Data Sheets shall be updated and resubmitted by Contractor once final values are known.
3. Do not leave items blank or labeled "To Be Determined" or "Later."
4. Do not submit manufacturer Product Data instead of completed data sheets.

P. Test reports:

1. Submit for Engineer's knowledge as contract administrator or for Owner.
2. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

Q. Certificates:

1. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor.

2. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
3. Certificates may be recent or previous test results on material or product, but must be acceptable to reviewer.

R. Manufacturer's instructions:

1. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Engineer for delivery to Owner in quantities specified for Product Data.
2. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

S. Manufacturer's field reports:

1. Submit report in duplicate within 30 days of observation for information.
2. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

T. Erection drawings:

1. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Engineer or Owner.

U. Samples:

1. Samples for selection as specified in product sections:
 - a. Submit for aesthetic, color, or finish selection.
 - b. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for selection.
2. Submit to illustrate functional and aesthetic characteristics of product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
3. Include identification on each sample, with full Project information.
4. Submit number specified in individual Specification Sections; 1 of which will be retained by Engineer.
5. Reviewed Samples which may be used in Work are indicated in individual Specification Sections.
6. Samples will not be used for testing purposes unless specifically stated in specification section.

7. Field Samples and mock-ups:
 - a. Erect at Project Site, at location acceptable to Engineer.
 - b. Size or area: That specified in respective Specification Section.
 - c. Fabricate each Sample and mock-up complete and finished.
 - d. Remove mock-ups upon acceptance of Work or when acceptable to Engineer.

V. Proposed products list:

1. Within 15 days after date of Notice to Proceed, submit list of major products proposed to Engineer for use, with name of manufacturer, trade name, and model number of each product.
2. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

W. Operations and maintenance manuals:

1. Designate in construction schedule, or in separate coordinated schedule, dates for submission and dates that reviewed operations and maintenance manuals will be needed.
2. Operations and maintenance manuals shall be presented in clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and like information to enable reviewer to review information as required. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Drawings.

1.06 RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in submittals required by Engineer and resubmit until stamped as either "Furnish and Submitted" or "Furnish as Corrected."
- B. Text and depictions changed on Submittal shall be back-circled (clouded).
- C. Engineer will assume that portions of Submittal not back-circled have not been changed by Contractor from previous submission.
- D. Indicate revision number and date in document revision block.

1.07 DISTRIBUTION

- A. Distribute reproductions of Shop Drawings which carry Engineer stamp as either "Furnish and Submitted" or "Furnish as Corrected" to:
 1. Job site file.

2. Record Documents file.
 3. Other affected contractors.
 4. Subcontractors.
 5. Supplier or fabricator.
- B. Distribute Samples which carry Engineer stamp as either "Furnish and Submitted" or "Furnish as Corrected" as directed by Engineer.

1.08 VIDEO DOCUMENTATION OF EXISTING CONDITIONS

- A. Prior to construction, perform video recording in all areas to be disturbed by construction. Recording shall document significant features that may be affected by construction activity. Payment for Video Documentation of Existing Conditions shall only occur if video documentation is provided prior to Contractor Mobilization / Start of Construction.
- B. Provide labor, equipment, and materials for televising and complete video documentation of construction areas.
- C. Personnel and equipment:
1. Furnish equipment, supplies, and materials necessary to complete Work as specified.
 2. Equipment not giving proper results shall be replaced.
- D. Camera and other components shall provide clean, clear, and sharp color picture.
- E. Video/photographic recording:
1. Provide complete color video recording of construction areas. Video recording media produced shall be compatible with Owner's video equipment.
 2. Produce video recordings of sufficient quality to allow proper in-house viewing with minimum of distortion; no image tearing.
 3. Provide voice narration on video recording to document following information:
 4. Name of city, street, and date upon which video inspection was made.
 5. Description of special features, i.e. cracked pavements, special landscaping, etc.
 6. Stop camera at special features for minimum of 10 seconds to allow for photographic documentation.
 7. Deliver video recording to Engineer who, after review, will deliver recording to Owner for permanent records.
 8. Label each recording to identify sewer and limits of coverage.

F. Recording procedure:

1. Camera shall be moved at uniform rate consistent with amount of detail being recorded.
2. Take necessary steps and adopt procedures to ensure optimum viewing conditions.

1.09 SAFETY PROCEDURES MANUAL

A. Prepare and submit to Owner safety procedures manual defining Contractor's safety program for work on site. Manual shall include:

1. Safety responsibilities of Contractor's personnel.
2. Description of Contractor's safety program.
3. Requirements of use of personal protective equipment.
4. General safety-related rules of conduct.
5. Fire prevention measures.
6. Accident reporting procedures.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section

4.02 PAYMENT

A. Payment for the Work specified under Part 1.08 of this section will be made at the lump sum price for VIDEO DOCUMENTATION OF EXISTING CONDITIONS. Payment for Video Documentation of Existing Conditions shall only occur if video documentation is provided prior to Contractor Mobilization / Start of Construction.

B. Payment will not be made for any other Items except as listed above. All other costs associated with such Work shall be included in the prices bid for the various items to which they pertain.

--- END OF SECTION ---

**ENVIRONMENTAL PROTECTION AND PROCEDURES
SECTION 01 35 43**

PART 1 – GENERAL

1.01 SCOPE OF WORK:

- A. The work covered by this Section consists of furnishing all labor materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purposes of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.
- C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Specific requirements for erosion and sedimentation controls are in Section 01 57 13.

1.02 APPLICABLE REGULATIONS:

- A. Comply with all Federal, State, and local laws and regulations concerning environmental pollution control and abatement.
- B. Contractor shall conduct operations so as not to violate any applicable ordinances, regulations, rules and laws pertaining to noise and air pollution and to conform to all provisions as set forth in the Rules and Regulations Governing Control of Air Pollution and Noise Pollution State of Illinois.

1.03 NOTIFICATIONS:

- A. The Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Owner, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Owner or from the regulatory agency through the Owner, immediately take corrective action. Such notice, when delivered

to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

3.01 PROTECTION OF STREAMS, WETLANDS, AND SURFACE WATER:

- A. Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.
- B. Turbidity barriers shall be installed and maintained during construction, and shall remain in place at indicated location until construction is completed and soils are stabilized.
- C. Water used during the Work which has become contaminated with oil, bitumens, harmful or objectionable chemicals, sewage or other pollutants shall be disposed of in a lawful manner and so as to avoid affecting all nearby waters and lands. Under no circumstances shall the Contractor discharge pollutants into any watercourse. The Contractor shall not allow water used in aggregate processing, concrete curing, foundation and concrete lift cleanup, dewatering activities or any other waste to directly enter a stream untreated. When water from adjacent natural sources is used in the Work, intake methods shall be such as to avoid contaminating the source of supply or becoming a source of erosion or sedimentation.
- D. Water being flushed from structures or pipelines after disinfection, with a Chlorine residual of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.

3.02 PROTECTION OF AIR QUALITY:

- A. Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. Sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Owner.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**PERMIT REQUIREMENTS
SECTION 01 41 26**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. It shall be the responsibility of the Contractor to secure all permits required to initiate and complete the work under this contract, except permits obtained by the Owner. The Contractor shall be responsible for complying with all permit and approval requirements including Owner obtained.

- B. No separate or direct payment will be made to the Contractor for permits and inspection requirements, but all such costs shall be included in the applicable items in the Schedule of Prices. The Owner shall furnish signed and sealed sets of Contract Documents for permit use as required.

- C. The Contractor shall furnish to the Engineer copies of all permits and / or agreements prior to commencement of work requiring permits.

- D. The following permits are being obtained by the Owner:
 - 1. Metropolitan Water Reclamation District – Watershed Management Ordinance Permit.
 - 2. Illinois Environmental Protection Agency – Permit for Construction / Operation

- E. The following permits have been initiated by the Owner and completion by the Contractor:
 - 1. None

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**QUALITY ASSURANCE
SECTION 01 43 00**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This Section covers Quality Assurance and Control requirements for this contract, which include but are not limited to the following:
1. Perform the inspections and test required by the Specifications.
 2. Provide product certifications as required by the Specifications.
 3. Test, adjust, balance, and operate mechanical and electrical equipment to demonstrate that they have been properly assembled, aligned, adjusted, wired, and connected. Make any adjustments or replacements found necessary.
 4. Neither observations by Engineer, Owner's Representative, nor inspections, tests, or approvals by other than Contractors, shall relieve Contractor from his/her obligation to perform the Work in accordance with the requirements of the Contract Documents.
- B. The Contractor is responsible for controlling the quality of work, including work of its subcontractors, suppliers, and manufacturers and for assuring the quality specified in the Technical Specifications is achieved.

1.02 CONTRACTOR FURNISHED TESTING LABORATORY SERVICES

- A. An independent commercial testing laboratory acceptable to the Engineer shall perform all tests that require the services of a laboratory to determine compliance with the Contract Documents. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- B. Preliminary Testing Services: The Contractor shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests for structural and embankment fills, backfill materials, and all other tests and engineering data required for the Engineer's review of materials and equipment proposed to be used in the Work. The Contractor shall obtain the Engineer's acceptance of the testing laboratory before having services performed, and shall pay all costs for services.
- C. The Contractor shall not retain any testing laboratory against which the Owner or the Engineer have reasonable objection, and if at any time during the construction process the services become unacceptable to the Owner, or the Engineer, either the Owner or the Engineer may direct in writing that such services be terminated. The request must be supported with evidence of

improper testing or unreasonable delay. If the Engineer determines that sufficient cause exists, the Contractor shall terminate the services and engage a different testing laboratory.

- D. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.
- E. The Contractor's testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel within three days after each test is completed. Distribution shall be two copies of each test report to the Engineer's Representative, one copy to the Owner, and one copy for the Contractor.

1.03 CONTRACTOR FURNISHED TESTING AND INSPECTION SERVICES

- A. The Contractor will employ the services of an independent testing agency to conduct concrete testing.
- B. The Contractor shall furnish a construction schedule and a minimum of 48 hour notice of readiness for testing and inspection of the work. The Engineer shall determine the exact time and location of field sampling and testing, and may require such additional sampling and testing as necessary to determine that materials and equipment conform with data previously furnished by Contractor and with the Contract Documents.
- C. The Contractor shall schedule the work to permit adequate time for testing and re-testing should test results not conform to the contract documents.
- D. The Contractor shall furnish material samples and cooperate in the field sampling and testing activities, interrupting the work when necessary. The Contractor shall furnish personnel, facilities and access to assist in the sampling and testing activities.

1.04 QUALITY ASSURANCE

- A. Codes and Standards: Refer to Article 3 - Documents: Intent, Requirements, Reuse, paragraph 3.03 of the General Conditions.
- B. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the Contractor for superintendence and quality control of the work, the Contractor shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the Contractor's personnel, subcontractors, and Engineer.

- C. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. The Contractor shall not use material and equipment for any purpose other than that intended or specified unless the Engineer authorizes such use.
- D. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the referenced standard.

1.05 MATERIALS AND EQUIPMENT

- A. The Contractor shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.
- B. The Contractor shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer's printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless approved otherwise by the Engineer.

1.06 MANUFACTURER'S FIELD SERVICES

- A. When specified in the technical specifications sections, the Contractor shall arrange for and provide technical representation from manufacturer's of respective equipment, items or components. The manufacturer's representative shall be a factory trained service engineer/technician with the type and length of experience specified in the technical specifications.
- B. Services Furnished Under This Contract: An experienced, competent, and authorized factory trained service engineer/technician representative of the manufacturer of each item of equipment for which field services are indicated in the specifications shall visit the site of the Work and inspect, operate, test, check, adjust if necessary, and approve the equipment installation. In each case, the manufacturer's service representative shall be present when the equipment is placed in operation. The manufacturer's service representative shall revisit the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory to the Engineer.

C. Refer to specific Technical Specification sections for additional requirements.

1.07 CERTIFICATION FORMS AND CERTIFICATES

A. The Contractor shall be responsible for submitting the certification forms and certificates in conformance with the requirements specified in Section 01 33 00 – Submittals.

PART 2 – PRODUCTS

All materials and equipment shall be provided as required by the Contractor for any specified testing.

PART 3 – EXECUTION

3.01 QUALITY CONTROL

- A. Quality control is the responsibility of the Contractor, and the Contractor shall maintain control over construction and installation processes to assure compliance with specified requirements.
- B. Certifications for personnel, procedures, and equipment associated with special processes (e.g., welding, cable splicing, instrument calibration, surveying) shall be maintained in the Contractor's field office, available for inspection by the Engineer. Copies shall be made available to the Engineer upon request.
- C. Means and methods of construction and installation processes are the responsibility of the Contractor, and at no time is it the intent of the Engineer to supersede or void that responsibility.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**TEMPORARY FACILITIES AND CONTROLS
SECTION 01 50 00**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install temporary facilities as hereunder specified, plus other unspecified temporary facilities, including labor, materials, services, utilities, and equipment, as may be required for proper performance of Contract, except as otherwise provided. Temporary facilities shall be approved by the Owner and other authorities having legal jurisdiction. Locate facilities where and as directed, and maintain in safe and sanitary condition at all times until completion of Work.
- B. At completion of work, or sooner when no longer needed, remove all temporary facilities, except where certain facilities are specified to remain or to be relocated for use under future contracts.

1.02 CONSTRUCTION EQUIPMENT

- A. Erect, equip, operate, and maintain construction equipment in strict accordance with applicable statutes, laws, ordinances, rules, and regulations of authorities having jurisdiction.

1.03 SAFETY PRECAUTIONS

- A. Provide and maintain barricades, fencing, shoring, pedestrian walkways including attached lights, other lights, and other safety precautions to properly guard against personal injury and property damage as prescribed by authority having jurisdiction (See also General Conditions, Article 7).
- B. Maintain such items for duration of Work, and repair, replace, and relocate them as necessary for safe protection.
- C. Provide such additional safety precautions as may be prescribed by authorities having jurisdiction.

1.04 ROADS AND ACCESSWAYS

- A. Entrance to Work Site: The Contractor and subcontractors shall use only those access points or entrance ways as directed by the Owner.
 - 1. Maintain access roads and parking areas in satisfactory condition during the Contract, and repair damages attributable to Work of this Project at intervals as needed. At completion of the Contract, roads, parking areas and entrance ways shall be left in condition at least equal to that existing

at start of the Contract, except as may be otherwise be required by the Contract documents.

1.05 TRAFFIC CONTROL, PUBLIC SAFETY AND CONVENIENCE

- A. The CONTRACTOR shall at all times conduct his work so as to assure the least possible obstruction to traffic and inconvenience to the general public and provide adequate protection of persons and property in the vicinity of the work.
- B. WHEN THE NORMAL FLOW OF TRAFFIC WILL BE IMPAIRED OR DISRUPTED IN ANY MANNER ON ANY STREET, THE CONTRACTOR SHALL NOTIFY THE VILLAGE OF BUFFALO GROVE POLICE DEPARTMENT AT (847) 459-2560 AT LEAST 48 HOURS IN ADVANCE.
- C. The work zone shall be maintained in accordance with Section 701 of the Standards Specifications for Road and Bridge Construction in Illinois, Current Edition. Negligence by the CONTRACTOR to follow these minimum guidelines that result in or causes damage to Village equipment during snow fall removal or any other similar Village operation will be the direct responsibility of the Contractor to repair. The repair will be completed by the Village and the cost of the repair will be deducted off the next pay request due to the Contractor.
- D. All operations by the Contractor such as flushing, dewatering, leaking water trucks or equipment, repairs to broken water services or water main, or similar that cause freezing of water on the pavement or sidewalk shall be maintained by salting, sanding or removal of the condition by the Contractor to the satisfaction of the Engineer. This work shall be included in the cost of the Contract.
- E. IDOT Standard 701006-05 Off Road Operations, 2L, 2W, 15' to 24' From Edge of Pavement; 701501-06 Urban Lane Closure, 2L, 2W, Undivided; 701801-06 Sidewalk, Corner, or Crosswalk Closure; 701901-08 Traffic Control Devices are considered an acceptable means of traffic control for this project.
- F. No roads shall be closed without prior written approval from the Engineer. Prior to any road closure the Contractor must present to the Engineer a detour plan with description on how resident access will be maintained and signage for the closure. Submittal of a road closure request to the Engineer does not guarantee approval by the Engineer. All additional traffic control required for road closures per the Contractors request shall be included in the cost of the applicable contract pay items.
- G. When permission has been granted to close an existing roadway, or portion thereof, the CONTRACTOR shall furnish and erect signs, barricades, lights, flags and other protective devices as necessary subject to the approval of the ENGINEER. From sunset to sunrise, the CONTRACTOR shall furnish and maintain as many yellow lights as the ENGINEER may direct.

- H. The Contractor shall be properly advised of the regulated weight limits within the surrounding areas of the project. No additional compensation in time or monetary value will be allowed. The Village of Buffalo Grove Police Department requires permits for Overweight / Over Sized Trucks or Vehicles. The Contractor can find additional information at www.vbg.org/645/Truck-Enforcement or by calling (847) 459-2560.
- I. During working hours the CONTRACTOR shall furnish watchmen in sufficient numbers to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work.
- J. No separate payment will be made for such signs, barricades, lights, flags, watchmen or other protective devices as required, with all costs thereof deemed to be included in the prices bid for the various items scheduled in the bid.
- K. "No Parking" signs must be approved by the Engineer and be POSTED AND DATED at least 24 hours before the intended date of use. "No Parking" signs shall be a minimum size of 8.5" x 11", with a contrasting background and lath or post mounted. Signage that is posted without the Engineer's consent will be fined \$500 / day until removed. No towing of vehicles shall be done by the Contractor.
- L. Sidewalks, gutters, drains, fire hydrants and private drives shall, insofar as practicable, be kept in condition for their intended uses. While the work is actually going on at any location, as much as half the street width at that location may be barricaded to exclude traffic entirely, but street traffic shall not be obstructed needlessly. Fire hydrants on or adjacent to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within ten feet of any such hydrant.
- M. Construction material stored upon the public street shall be placed so as to cause as little obstruction to the general public as is reasonably possible.

1.06 USE OF VILLAGE PROPERTY

- A. On-Site Storage and Work Areas: The Village will allocate available on-site storage and work areas to the Contractor, subject to change as may be necessary by job progress, such as site development or intervening work.
- B. Village Property and Right-of-Way: Operations shall be confined to Village property and right-of-way to greatest extent, and shall not encroach on areas other than those designated or approved for such use by the Village.

1. Ascertain, observe, and comply with rules and regulations in effect, including but not restricted to, parking and traffic regulations, hours of allowable ingress and egress to main arteries, and the like.
- C. Existing Improvements in Streets and Parking Area: Existing signs, fire hydrants, underground valves and meter boxes, manholes, and other items occurring adjacent to the site shall be left undisturbed, unobstructed, and easily accessible at all times during construction, except as otherwise indicated or agreed to between Contractor and Village authorities.
- D. Covering, moving, trimming, or altering which may become necessary shall be done only with consent of and in cooperation with Village authorities having jurisdiction. Contractor shall pay costs that may be incurred.
- E. Make detailed examination of such Village property at start of work and conditions shall be noted by Contractor and confirmed by Village.
1. Village streets and other existing improvements therein adjacent to site, if damaged by this work, shall be repaired by the Contractor at intervals as needed. At the completion of the project, all such items not included in the Contract shall be left in condition at least equal to that at the start of operations.
 2. Repair work shall conform to requirements of the Village. This includes, but is not restricted to, temporary walks for pedestrians, cleaning of mud and debris, air pollution control, and traffic control.
- F. Protection of Trees and Shrubs: Existing trees and shrubs to remain shall not be injured during the course of this work. Trim tree only to the extent required for construction. Coordinate with Village and Property Owner for any tree trimming required.
1. If any tree or shrub during the course of, or as a result of construction operations is injured to extent of causing its permanent disfigurement or death, the Contractor shall pay the cost of damages to the Village for each tree or shrub so injured, amount to be agreed upon by the Village and Contractor.
- G. Protection of Existing Utilities: Protect from damage, existing utility lines not specified to be altered by Work of this Contract; any such features damaged shall be repaired or replaced to condition equal to that existing prior to commencing work of this Contract. Unless otherwise specified, maintain existing utility service at all times during construction. Utility service lines found entering site and not indicated to remain or to be incorporated in new Work, shall be plugged, capped, or otherwise abandoned by Contractor in manner satisfactory to Utility Companies whose services are involved, except as otherwise required.

1.07 CLEAN UP OF WORK AND DISPOSAL OF TRASH

- A. Keep work and storage areas clean and free of rubbish and perform protective and cleanup work within one day of being so notified by the Owner.
- B. Dispose of trash resulting from work. Recycle materials to the extent practicable.

1.08 SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures at each construction location. Existing facility use is not permitted. Provide at time of project mobilization.

1.09 TEMPORARY WATER

- A. Make arrangements for water required for construction purposes; furnish and install temporary piping or hose to carry water to every part of construction.

1.10 TEMPORARY ELECTRICITY

- A. The site currently has a dedicated electric service for the existing lift station which may remain active until the service transfer is made between the old and new service (scheduled by the Contractor). The existing service shall not be modified in any way that impacts the operation of the existing lift station while still in service.
- B. The Contractor shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, panelboards, outlets, lamps, fuses, controls, meters and accessories.
- C. The electric service shall be of sufficient capacity and characteristics to supply the proper current for the various types of construction tools, motors, welding machines, lights, heating plant, pumps, and other work required.
- D. The Contractor shall pay charges and fees by power company for providing the electrical service and for power used at no additional cost to the Owner.
 - 1. Perform all work in accordance with the power company's requirements and in manner approved by power company.
 - 2. Notify power company prior to work.
- E. The Contractor shall provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.11 DEWATERING FACILITIES

- A. Provide and maintain dewatering and pumping facilities to keep site reasonably dry, and to protect materials and installed work from water damage until dewatering is no longer required. Remove dewatering facilities from site when no longer needed. The Contractor shall refer to the soil boring report provided in Section 02 06 14.

1.12 SECURITY

- A. Contractor shall be responsible for security of Work involved in this Project, during entire time of Contract. Make good all damages to work and loss of materials due to vandalism or theft, within this responsibility.

1.13 TEMPORARY FENCING

- A. Provide commercial grade chain link fence to prevent trespass by workmen and suppliers onto private property and the public from the construction site.
- B. Provide 6-foot high fence around construction site. Equip fence with vehicular and pedestrian gates with locks.
- C. Coordinate location of temporary fencing with Owner's Representative.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section

4.02 PAYMENT

- A. Payment for the Work specified under this section will be made at the lump sum price for TEMPORARY FACILITIES AND CONTROLS.

--- END OF SECTION ---

TEMPORARY NO PARKING

TIME:

DATE:

CONSTRUCTION ZONE

Note – Hand written information must be dark, legible and large. Sign shall be printed on more than paper, unless laminated. Must withstand winds and stay on stake/lath.

**TEMPORARY BYPASS PUMPING SYSTEMS
SECTION 01 51 00**

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Furnishing all materials, labor, equipment, power, maintenance, etc. to implement a temporary pumping system for the purpose of diverting the existing raw wastewater flow around the work area at each lift station for the durations specified and disassembly of the bypass pumping system as specified herein.
- B. Be responsible for the design, installation and operation of the temporary pumping system. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- C. The Contractor is responsible to maintain flow at each station throughout the contract period of construction. Once the Contractor mobilizes, the Village cedes responsibilities of station operations to the Contractor until Substantial Completion is reached.

1.02 SYSTEM DESCRIPTION

A. Bypass Pumping Layout

- 1. The existing lift station is arranged with a single 11-foot square wet well upstream of the dry well. This wet well has multiple incoming sewer flows with an estimated average daily flow of 491,275 GPD. manhole upstream of the wet-well from two gravity lines. The average daily flow is roughly split between the 12" sewer that enters the wet well from the south and the 24" sewer that enters from the east. The upstream gravity system has an estimated maximum 60,000 wet well and in pipe storage of in pipe capacity before bypass pumping must be active or roughly 4-hours. There is no bypass pumping valving and pipe currently on site. It shall be the responsibility to review the site layout for the preparation and submittal of a bypass pumping plan.

B. Design Requirements:

- 2. Provide bypass pumping systems with firm capacity to pump down the flows listed in 1.02.A above.
- 3. Provide all pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely

diverted around the pumping station. Bypass pumping system will be required to operate 24 hours per day.

4. Provide control system for the bypass pumping system which will run the pump(s) between preset levels. Additional controls are required to for high-high level and low-low Level alarms, and any pump faults.
 5. Provide adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure.
 6. The bypass pumping system shall be capable of bypassing the flow around the work area as necessary for satisfactory performances of work.
 7. Make all arrangements for bypass pumping during the time when the pumping station is shut down for any reason. System must overcome any existing force main pressure on discharge.
- C. It is essential to the operations of the existing wastewater system that there be no interruption in the flow of sewage throughout the duration of the project. To this end, provide, maintain and operate all temporary facilities such as, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the wastewater flow before it reaches the point where it would interfere with the work, carry it past the work and return it to the existing wastewater downstream of the work.
- D. Provide all necessary means to safely convey the raw wastewater past the work area. Do not stop or impede the main flows under any circumstances.
- E. Maintain wastewater flow around the work area in a manner that will not cause surcharging of wastewater, damage to existing pipe line and that will protect public and private property from damage and flooding.
- F. Fluid Character: Provide pumping units to pump raw wastewater.
- G. Furnish pumps which meet rating capacity and head indicated on Process Pump Schedule.
- H. Pumps shall be capable of passing a minimum of a 3-inch non-deformable sphere.

1.03 SUBMITTALS

A. Provide all submittals, including the following, in accordance with Section 01 33 00, SUBMITTALS.

B. Data:

1. Pump Data:

- a. Pump performance curves. Draw curves for the specified conditions. Include head, brake horsepower, efficiency and required NPSH, all plotted as a function of capacity, from zero to maximum capacity.
- b. Calculations of static lift, friction losses, and flow velocity.
- c. Submit a specific, detailed description of the proposed pumping system.
- d. Submit operating descriptions, component descriptions, control schematics, electrical connection diagrams and general arrangement drawings, for control equipment.

D. Drawings:

1. Shop Drawings:

- a. Submit shop drawings, including arrangement and erection drawings of the equipment and equipment operating characteristics. Include the following:
 - i. Submit detailed plans and descriptions outlining all provisions and precautions to be taken regarding the handling of existing wastewater flows. The plan shall include schedules, locations elevations, capacities of equipment, materials and all other incidental items necessary and/or required to insure proper protections of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements and all permit conditions.
 - ii. The plan shall include but not be limited to details of the following:
 - (a) Staging areas for pumps;
 - (b) Number, size, material, location and method of installation of suction piping;
 - (c) Number, size, material, location of installation of discharge piping;
 - (d) Bypass pump sizes, capacity, number of each size to be on site and motor power of fuel requirements;
 - (e) Standby power generator size, location;

- (f) Downstream discharge plan;
- (g) Thrust and restraint block sizes and locations;
- (h) Sections showing suction and discharge pipe depth, embedment, select fill and special backfill;
- (i) Method of noise control for each pump and/or generator;
- (j) Any temporary pipe supports and anchoring required;
- (k) Design plans and computation for access to bypass pumping locations indicated on the drawings;
- (l) Calculations for selection of bypass pumping pipe size;
- (m) Schedule for installation of and maintenance of bypass pumping lines;
- (n) Plan indicated selection location of bypass pumping line locations.

PART 2 – PRODUCTS

2.01 EQUIPMENT

- A. All pumps used shall be centrifugal self-priming units that do not require the use of footvalves or Compressor in the priming system. The pumps shall be diesel or electric powered. Pumps shall have sound attenuation enclosure designed for operation at sound levels of 70 decibels and below. The Contractor is fully responsible for coordinating and obtaining temporary electrical service. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of influent flows. The pumps shall not be hydraulic submersible type.
- B. The Contractor shall include one stand-by temporary bypass pump to be maintained on site. Stand-by temporary bypass pumps shall be on-line and shall be piped into the inflow and to the bypass piping so that upon starting the stand-by pump shall take over and pick up the flow. Stand-by temporary bypass pumps shall be isolated from the primary bypass system by valving as required.
- C. Provide the necessary stop/start control system for each pump. The control system shall remotely contact the contractor with notification of any problem. The contractor is responsible for responding within one (1) hour to the alarm and correcting the problem.
- D. Discharge Piping – in order to prevent the accidental spillage of flows, all discharge systems shall be temporarily constructed of rigid pipe with positive, restrained joints.
- E. Under no circumstances will aluminum “Irrigation” type piping and glued PVC pipe be allowed. Discharge hose will only be allowed in short sections and by

specific permission from the ENGINEER. Provide piping materials of steel pipe, ductile iron pipe, or fused, high density polyethylene pipe.

PART 3 – EXECUTION

3.01 PRECAUTIONS

- A. Be responsible for locating any existing utilities in the area selected for installing the bypass pipelines. Locate bypass pipelines to minimize any disturbance to existing utilities and obtain approval of the pipeline locations from the ENGINEER. All costs associated with relocating utilities and obtaining all approvals shall be included in the Contract Price.

3.02 INSTALLATION AND REMOVAL

- A. Make connections to the existing wastewater pipelines and construct temporary bypass pumping structures only at the access location indicated on the drawings and as may be required to provide adequate suction conduit.
- B. Plugging or blocking of wastewater flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the wastewater flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
- C. The installation of the bypass pipelines is prohibited in all wetland areas. The pipeline must be located off streets and sidewalks and on shoulder of the roads. When the bypass pipeline crosses local streets and private driveways, place the bypass pipelines in trenches and cover with temporary pavement. Upon completion of the bypass pumping operations, and after the receipt of written permission from the ENGINEER, remove all the piping, restore all property to pre-construction condition and restore all pavement. Be responsible for obtaining any approvals for placement of the temporary pipeline within public ways from the city.

3.03 FIELD QUALITY CONTROL AND MAINTENANCE

- A. Testing: Perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. Test the piping at a test pressure of 50 psi. Provide 24 hours notice to the ENGINEER prior to testing.
- B. Inspection: Inspect bypass pumping system as needed to ensure that the system is working correctly.

C. Maintenance Service: Insure that the temporary pumping system is properly maintained and a responsible operator is on hand at all times when pumps are operating.

D. Extra Materials:

1. Spare parts for pumps and piping shall be kept on site as required.
2. Adequate hoisting equipment for each pump and accessories shall be maintained on the site.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum price for TEMPORARY BYPASS PUMPING.

--- END OF SECTION ---

**EROSION AND SEDIMENT CONTROL
SECTION 01 57 13**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Furnish all work and take all measures necessary to control soil erosion resulting from construction operations, prevent flow of sediment from construction site, and contain construction materials (including excavation and backfill) within protected working area.

1.02 REFERENCE

- A. Perform all Work of this Section in accordance with the applicable requirements of the latest edition of IEPA Standards and Specifications for Soil Erosion and Sediment Control and Article 280 of the Illinois State Standards for Road and Bridge Construction, latest edition.

1.03 SUBMITTALS

- A. Two weeks prior to the start of the work, submit to Engineer, for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

1.04 QUALITY ASSURANCE

- A. Use acceptable procedures, including use of water diversion structures, diversion ditches, settling basins, and sediment traps.
- B. Operations restricted to areas of work indicated on drawings and area which must be entered for construction of temporary or permanent facilities.
- C. If construction materials are washed away during construction, remove materials from fouled areas.
- D. Stabilize diversion outlets by means acceptable to Engineer.

PART 2 – PRODUCTS

All products and materials shall meet or exceed the requirements of IEPA Standard Specifications for Soil Erosion and Sediment Control.

PART 3 – EXECUTION

3.01 PROTECTION OF STREAMS, WETLANDS, AND SURFACE WATER:

- A. Do not discharge chemicals, fuels, lubricants, bitumen, raw sewage and other harmful waste into or alongside any body of water or into natural or man-made channels.
- B. The Contractor shall provide adequate means of erosion and sediment control all in accordance with the herein referenced IEPA and SSRBC Standard Specifications. The Contractor shall maintain continuous surveillance and shall continuously maintain, realign, repair or replace all erosion devices required for construction activities and/or as shown on the Drawings or requested by the Owner's Representative, that are displaced or damaged by wind, water, traffic, Contractor operations or any other cause. The maintenance of the erosion control plan shall be for the full length of the Contract unless otherwise specifically agreed upon in writing by the Owner.

3.02 MAINTENANCE OF SITE AND EROSION CONTROL PRACTICES:

- A. The Contractor shall sweep the roadway pavement at the end of each work day with a mechanical sweeper as deemed necessary by the Engineer. The debris shall be deposited in a self-containment type system that shall be disposed of according to Article 202.03 of the Standard Specifications for Road and Bridge Construction in Illinois, Current Edition.
- B. The Contractor will be required over the course of construction to clean inlet filter baskets weekly or prior to a forecasted rain event, whichever is sooner. Many of the homes in the Village have lower garages and are susceptible to damage when streets flood. In the event water is not properly running through inlet filter baskets caused by debris the Village crews may respond to resident calls about street flooding. All Village expenses incurred in labor and materials due to these calls will be back charged to the Contractor and taken off a future pay request.
- C. The Contractor will be required to perform erosion control best management practices as listed on the plans, specifications, and details during construction. Discharge of silt laden water or construction debris into the storm sewer or waterway will be grounds for a fine and the Contractor will be responsible for cleaning all storm sewers and waterways to their preconstruction condition to the satisfaction of the Engineer. In the event and illicit discharge occurs, the Contractor shall concentrate their work efforts on remedying the situation to correct the deficiency.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum price for EROSION AND SEDIMENT CONTROL.

--- END OF SECTION ---

**MATERIAL AND EQUIPMENT
SECTION 01 60 00**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Furnish Proposed Manufacturers List: Within 15 calendar days of the date of the Notice to Proceed, submit to the ENGINEER a list of the names of proposed manufacturers, material men, suppliers, dealers and subcontractors. Obtain approval of this list by OWNER prior to submission of any shop drawings. Upon request submit evidence to ENGINEER that each proposed manufacturer has manufactured a similar product to the one specified and that it has previously been used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.
- B. Provide material and equipment essential to the installation of the equipment and materials, and otherwise shown to be provided under this contract, which meet the following:
1. Standards: Design equipment and appurtenances in conformity with ANSI, ASME, IEEE, NEMA, OSHA, NACE, AGMA, AISC, AWWA, and other generally accepted standards. Equipment and appurtenances shall be of rugged construction and of sufficient strength to withstand all stresses which may occur during fabrication, testing, transportation, installation, and all conditions of operation.
 2. Electrical Requirements: Electrical devices, motors, equipment, control panels, electrical equipment enclosures, and other electrical equipment appurtenances shall be labeled by UL or other approved testing agency. Shop drawings for electrical equipment shall denote that the represented material has the approved testing agency label. Nonlisted materials and special equipment devices not normally listed by the approved testing agency and labeled shall equal or exceed the latest standards for such types of equipment. The Contractor shall be responsible for providing the services of an electrical inspection firm to certify compliance of all nonlisted materials to the approved testing agency standards and for providing materials with an inspection label in accordance with the approved testing agency standards.
 3. Complies with size, make, type, and quality specified or as specifically approved, in writing, by ENGINEER.
 4. Will fit into the space provided with sufficient room for operation and maintenance access and to properly connect to piping, ducts and services as applicable.

5. Manufacture and fabricate in accordance with the following:
 - a. Design, fabricate, and assemble in accordance with the standards referenced and the requirements given in the pertinent sections, clauses, paragraphs, and sentences, both directly and indirectly applicable thereto, in that part of the Contract Documents.
 - b. Provide equipment which is new, unused, and correctly designed. It shall be of standard first-grade quality, produced by expert workmen.
 - c. Details shall be designed for appearance as well as utility. Protruding members, joints, corners, and the like, shall be finished in appearance. All exposed welds shall be ground smooth and the corners of structural shapes shall be mitered.
 - d. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
 - e. Provide two or more items of same kind identical, by same manufacturer.
 - f. Provide materials and equipment suitable for service conditions.
 - g. Adhere to equipment capabilities, sizes, and dimensions shown or specified unless variations are specifically approved, in writing, in accordance with the Contract Documents.

6. Use material or equipment only for the purpose for which it is designed or specified.

1.02 SUBSTITUTIONS

A. Substitutions:

1. CONTRACTOR'S requests for changes in equipment and materials from those required by the Contract Documents are considered requests for substitutions and are subject to CONTRACTOR'S representations and review provisions of the Contract Documents when one of following conditions are satisfied:
 - a. Where required equipment or material cannot be provided within Contract Time, but not as result of CONTRACTOR'S failure to pursue Work promptly or to coordinate various activities properly.
 - b. Where required equipment or material cannot be provided in manner compatible with other materials of Work, or cannot be properly coordinated therewith.

2. CONTRACTOR'S Options:
 - a. Where more than one choice is available as options for CONTRACTOR'S selection of equipment or material, select option

compatible with other equipment and materials already selected (which may have been from among options for other equipment and materials).

- b. Where compliance with specified standard, code or regulation is required, select from among products which comply with requirements of those standards, codes, and regulations.

B. Conditions Which are Not Substitution:

1. Requirements for substitutions do not apply to CONTRACTOR options on materials and equipment provided for in the Specifications.
2. Revisions to Contract Documents, where requested by OWNER or ENGINEER, are "changes" not "substitutions".
3. CONTRACTOR'S determination of and compliance with governing regulations and orders issued by governing authorities do not constitute substitutions and do not constitute basis for a Change Order, except as provided for in Contract Documents.

1.03 MANUFACTURER'S WRITTEN INSTRUCTIONS

- A. Instruction Distribution: When the Contract Documents require that installation, storage, maintenance and handling of equipment and materials comply with manufacturer's written instructions, obtain and distribute printed copies of such instructions to parties involved in installation, including three copies to ENGINEER. Maintain one set of complete instructions at job site during storage and installation, and until completion of work.
- B. Manufacturer's Requirements: Store, maintain, handle, install, connect, clean, condition, and adjust products, equipment, and materials in accordance with manufacturer's written instructions and in conformity with Specifications.
 1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult ENGINEER for further instructions.
 2. Do not proceed with work without written instructions.
- C. Performance Procedures: Perform work in accordance with manufacturer's written instructions. Do not omit preparatory steps or installation procedures, unless specifically modified or exempted by Contract Documents.
- D. Documentation: The CONTRACTOR shall document that CONTRACTOR has conformed to Manufacturer's Requirements and submit written documentation to OWNER.

1.04 TRANSPORTATION AND HANDLING

- A. Coordination with Schedule: Arrange deliveries of products, materials, and equipment in accordance with Construction Progress Schedules. Coordinate to avoid conflict with work and conditions at site.
 - 1. Deliver products and move from storage materials and equipment in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
 - 2. Protect bright-machined surfaces, such as shafts and valve faces, with a heavy coat of grease prior to shipment.
 - 3. Immediately upon delivery, inspect shipments of products, materials, and equipment to determine compliance with requirements of Contract Documents and approved submittals and that material and equipment are protected and undamaged.
- B. Handling: Provide equipment and personnel to handle products, materials, and equipment by methods recommended by manufacturer to prevent soiling or damage to materials and equipment or packaging.

1.05 STORAGE, PROTECTION, AND MAINTENANCE

- A. General: Store and maintain equipment and materials from the time of delivery until the time the CONTRACTOR moves the equipment from storage for installation. Provide all storage facilities and storage maintenance in accordance with these requirements.
- B. Exterior storage areas:
 - 1. Coordinate location of storage areas with ENGINEER and OWNER.
 - 2. Arrange on-site storage areas for proper protection and segregation of stored materials and equipment with proper drainage. Provide for safe travel around storage areas and safe access to stored materials and equipment.
 - 3. Storage site shall be located within the boundaries of the 6-foot tall security fencing specified in Section 01 50 00, and as shown on the plans. Additional property on the adjacent Park District may be made available.
 - 4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

5. Store materials such as pipe, reinforcing and structural steel, and equipment on pallets, blocks or racks, off ground.
6. Store fabricated materials and equipment above ground, on blocking or skids, to prevent soiling or staining. Cover materials and equipment which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

C. Interior Storage:

1. Store materials and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible.
2. Store materials and equipment, subject to damage by elements, in weather tight enclosures.
4. Maintain temperature and humidity within ranges required by manufacturer's instructions.

C. Accessible Storage: Arrange storage in a manner to provide easy access for inspection and inventory. Make periodic inspections of stored materials or equipment to assure that materials or equipment are maintained under specified conditions and free from damage or deterioration.

1. Perform maintenance on stored materials of equipment in accordance with manufacturer's instructions, in presence of OWNER or ENGINEER.
2. Submit a report of completed maintenance to ENGINEER with each Application for Payment.
3. Failure to perform maintenance, to notify ENGINEER of intent to perform maintenance or to submit maintenance report may result in rejection of material or equipment.

D. OWNER'S Responsibility: OWNER assumes no responsibility for materials or equipment stored in buildings or on-site.

E. CONTRACTOR'S Responsibility:

1. CONTRACTOR assumes full responsibility for protection of the equipment.
2. CONTRACTOR assumes full responsibility for protection of completed construction and installation. Repair and restore damage to completed Work equal to its original condition.

- D. Special Equipment: Use only rubber tired wheelbarrows, buggies, trucks, or dollies to wheel loads over finished floors, regardless if the floor has been protected or not. This applies to finished floors and to exposed concrete floors as well as those covered with composition tile or other applied surfacing.
- E. Surface Damage: Where structural concrete is also the finished surface, take care to avoid marking or damaging surface.

1.06 SPECIAL TOOLS AND LUBRICATING EQUIPMENT

- A. General: Contractor shall provide for his own use, as per manufacturer's recommendations, any and all special tools required for installation, checking, alignment, balancing, testing, parts replacement, and maintenance. (Special tools are those which have been specially designed or adapted for use on parts of the equipment, and which are not customarily and routinely carried by maintenance mechanics.)

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

MOBILIZATION AND DEMOBILIZATION SECTION 01 71 13

PART 1 – GENERAL

1.01 SCOPE:

- A. The work consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract. It does not include mobilization and demobilization for specific items of work for which payment is provided elsewhere in the contract. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

1.02 MOBILIZATION:

- A. Mobilization shall include all activities and associated costs for transportation of contractor's personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary general facilities for the contractor's operations at the site; premiums paid for performance and payment bonds including coinsurance and reinsurance agreements as applicable; and other items specified in this specification.

1.03 DEMOBILIZATION:

- A. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not required or included in the contract from the site; including the disassembly, removal, and site cleanup of offices, buildings, and other facilities assembled on the site specifically for this contract.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

Mobilization schedule shall be presented at the Preconstruction Meeting. Notification of changes in mobilization and demobilization schedules shall be submitted to the Owner 48 hours in advance of mobilization / demobilization activities.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. MOBILIZATION AND DEMOBILIZATION will not be measured for payment.

4.02 PAYMENT

A. This work will be paid for at the lump sum price for MOBILIZATION AND DEMOBILIZATION.

B. The amount of which the Contractor will receive payment for, according to the following schedule, will be limited to one percent of the original contract amount. Should the bid for MOBILIZATION AND DEMOBILIZATION exceed one percent, the amount over one percent will not be paid until 90 percent of the adjusted contract value is earned.

1. Upon execution of the contract, 75 percent of the pay item will be paid.
2. Upon completion of 90 percent of the adjusted contract value, the remaining 25 percent of the pay item will be paid along with any amount in excess of one percent of the original contract amount.

--- END OF SECTION ---

**LINES AND GRADES
SECTION 01 71 20**

PART 1 – GENERAL

1.01 GENERAL:

- A. The Contractor shall construct all work in accordance with the lines and grades shown on the Drawings and assume full responsibility for keeping all alignment and grade.

1.02 CONTROL POINTS:

- A. Reference control will be established and provided by the Owner on the plans or separately after the bid award. The Datum utilized for this control shall be maintained during the construction.

1.03 PROTECTION OF SURVEY DATA:

- A. General: The Contractor shall take the necessary topography, locate all earthwork and structures, and establish all grades necessary for the accomplishment of the Work. The Contractor shall safeguard all points, stakes, grade marks, known property corners, monuments, and bench marks established for the work; Reestablish them if disturbed, and bear the entire expense of checking reestablished marks and rectifying work improperly installed.
- B. Records: The Contractor shall keep neat and legible notes of measurements and calculations made in connection with the layout of the Work. Furnish copies of such data to the Owner for use in checking the Contractor's layout. Data considered of value to the Owner will be transmitted to the Owner by the Contractor with other records on completion of the Work.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**CLEANING UP
SECTION 01 74 00**

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. During its progress, the work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
- B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, work done under this contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc., shall, upon completion of the work, be left in a clean and neat condition.
- C. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- D. Upon completion of the work, the Contractor shall remove from the sites of the subsurface explorations all of his plant, machinery, tools, equipment, temporary work, and surplus materials; shall, unless otherwise directed or permitted in writing, remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- E. The Contractor shall thoroughly clean all materials and equipment installed by him and his sub-contractors, and on completion of the work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
- F. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway,

walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

As specified in applicable sections of the Contract Documents.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**CLOSEOUT PROCEDURES
SECTION 01 77 00**

PART 1 – GENERAL

1.01 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. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.02 FINAL CLEANING

- A. Provide final cleaning prior to final acceptance.
- B. Clean interior and exterior, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- D. Replace filters of operating equipment.
- E. Clean all sanitary manholes and storm sewer manholes, catch basins, and inlets.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.03 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

1.04 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel 2 weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment and instruct in a classroom environment located at the project site and instructed by a qualified manufacturer's representative who is knowledgeable about the Project.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at each location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. Amount of time required for instruction on each item of equipment and system is that specified in individual sections.

1.05 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. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Prohibit traffic from landscaped areas.

1.06 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. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates utilized.
3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction including:

1. Measured depths of foundations in relation to finished floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.
6. All elevations shall be recorded on the NAVD 88 datum, consistent with the plans.
7. As-builts with insufficient recorded information will be rejected. In particular the contractor shall note where all elevation adjustments and alignment adjustments have been installed.
8. As-builts must be turned in with the Contractors notice of completion. Failure to submit as-builts with the notice of completion will begin to trigger liquidated damages after the project completion date or when working days have been exhausted.

G. Submit documents to Engineer with claim for final Application for Payment.

1.07 OPERATION AND MAINTENANCE DATA

- A. Operation and maintenance data shall be in English language.
- B. Submit data bound in 8-1/2" x 11" text pages, 3-D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:

- a. Significant design criteria.
- b. List of equipment.
- c. Parts list for each component.
- d. Operating instructions.
- e. Maintenance instructions for equipment and systems.
- f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

3. Part 3: Project documents and certificates, including the following:

- a. Shop drawings and product data.
- b. Air and water balance reports.
- c. Certificates.
- d. Originals or Photocopies of warranties and bonds.

G. Submit draft copy of completed volumes 15 calendar days prior to final inspection. Draft copy will be reviewed and returned after final inspection, with Engineer comments. Revise content of all document sets as required prior to final submission.

H. Submit 3 sets of revised final volumes, within 10 calendar days after final inspection.

I. Submit digital format of manuals in PDF format in addition to hardcopies described above.

1.08 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Provide spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

1.09 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten calendar days after completion of the applicable item of work.

- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify that documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- C. Provide Table of Contents and assemble in 3-D side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. Time of Submittals:
 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 2. Make other submittals within 10 calendar days after Date of Substantial Completion, prior to final Application for Payment.
 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 calendar days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

1.10 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections for 2 years from date of Substantial Completion.
- B. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- D. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**SITE PREPARATION
SECTION 02 10 00**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide labor, material, tools and equipment to prepare site as indicated and specified.

PART 2 – PRODUCTS

As specified in applicable sections of the Contract Documents.

PART 3 – EXECUTION

3.01 EXISTING TREES AND VEGETATION

- A. Avoid cutting or injuring trees and vegetation outside easement line and outside areas to be cleared as indicated, without Engineer's permission.
- B. Accept responsibility for damages outside these lines.
- C. Remove trees within permanent and temporary easement as designated by Engineer.
- D. All damage to existing hardscape from tracked equipment shall be replaced at the Contractor's expense. It is recommended rubber tired or rubber tracked equipment is used. Any unwarranted disturbance to the existing hardscape to remain will warrant repairs made joint to joint and in conformance with the bid documents. All work shall be done to the satisfaction of the Engineer. The Engineer shall determine with the Village limits of removals and replacements due to the Contractor's negligence.

3.02 CLEARING

- A. Cut or remove trees, brush, and other vegetative matter such as snags, bark and refuse, from areas to be cleared. Clear ground to width of permanent easement unless otherwise directed.
- B. Cut trees, stumps, and stubs to be cleared, except where clearing done by machinery, as close to ground surface as practicable, but no more than 6 in. above ground surface for small trees and 12 in. for larger trees.

3.03 GRUBBING, STRIPPING, DISPOSAL

- A. Remove stumps and roots larger than 3 in. in diameter to a depth of 12 in., and roots larger than ½ in. in diameter to a depth of 6 in. Measure depths to cut from existing ground surface or proposed finished grade, whichever is lower.
- B. Strip stumps, roots, foreign matter, topsoil and unsuitable earth from ground surface. Utilize topsoil insofar as possible for finished surfacing.
- C. Promptly dispose off site material from clearing and grubbing not reused or stockpiled. In doing so, observe all applicable laws, ordinances, rules and regulations. Do not consider work completed until final cleaning, unless otherwise directed.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

**GEOTECHNICAL DATA REPORT
SECTION 02 06 14**

PART 1 – GENERAL

1.01 GENERAL SPECIFICATIONS

- A. The attached geotechnical reports are provided for the Contractor's information regarding soil pH and geotechnical properties.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

PART 4 – MEASUREMENT AND PAYMENT

Not Used



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May 24, 2019
File No. 24537

Mr. Luke A. Mattson, P.E.
Ciorba Group
8725 W. Higgins Road, Suite 600
Chicago, IL 60631

Re: Geotechnical Investigation
Chatham Lift Station
Buffalo Grove, Illinois

Dear Mr. Mattson:

The following is our report of findings for the geotechnical investigation completed for the Chatham Lift Station in the Village of Buffalo Grove, Illinois.

The investigation was requested to determine current subsurface soil and water conditions at a select boring location. The findings of the field investigation and the results of laboratory testing are intended to assist in the planning, design and construction of proposed lift station.

SCOPE OF THE INVESTIGATION

The field investigation included obtaining 1 boring at the location requested and as indicated on the enclosed location sketch. The boring location was established using field taping methods and accuracy with a surface elevation determined using the temporary benchmark indicated on the location sketch.

We auger drilled the boring to a depth of 40.0 feet below existing surface elevations. Soil samples were obtained using a split barrel sampler advanced utilizing an automatic SPT hammer. Soil profiles were determined in the field and soil samples returned to our laboratory for additional testing including determination of moisture content. Cohesive soils obtained by split barrel sampling were tested further to determine dry unit weight and unconfined compressive strength.

The results of all field determinations and laboratory testing are included in summary with this report.

RESULTS OF THE INVESTIGATION

Enclosed is the boring log indicating soil conditions encountered. Site surface conditions include vegetation, topsoil and fill soil conditions. Composition of the fill includes the presence of topsoil, silt/clay, clay/silt and crushed gravel mixtures extending to a depth of 32.0 feet at this location. The limits of fill placement were not determined within the scope of this investigation. Larger debris may also be present within the fill but was not encountered during the investigation.

8 W. COLLEGE DR. • SUITE C • ARLINGTON HEIGHTS, IL 60004

SOIL BORINGS • SITE INVESTIGATIONS • PAVEMENT INVESTIGATIONS • GEOTECHNICAL ENGINEERING
TESTING OF • SOIL • ASPHALT • CONCRETE • MORTAR • STEEL

Underlying natural soil conditions include the presence of non-cohesive soils. These include loose to medium dense sand/gravel and silt/clay mixtures. The granular backfill and non-cohesive granular soils are in a saturated condition. Cobbles and boulders may be present within the site soils at any elevation, although none were encountered while drilling.

The following table summarizes depth ranges below existing grade, the magnitude of soil strength within these ranges and other information:

<u>Boring</u>	<u>Surface Elevation (feet)</u>	<u>Depth Range Below Existing Surface (feet)</u>	<u>Soil Strength (lbs./sq.ft.)</u>	<u>Recorded Water Levels, W.D./A.D. (feet)</u>
1	99.6	1.5 to 5.0	*2,000	8.5/7.5
		5.0 to 32.5	*500	
		32.5 to 37.0	3,000	

* Not recommended for support of foundations.

It is expected that foundations can be supported on undisturbed natural soils located at any elevation within the depth ranges indicated in the above table, except as noted. Above these depth ranges the soils are not considered able to support foundations, even at reduced design bearing values, due to long-term settlement considerations.

SUBSURFACE WATER

The boring logs and the above table indicate the depth at which subsurface water was encountered in the bore hole at the time of the drilling operations and during the period of these readings. It is expected that fluctuations from the water levels recorded will occur over a period of time due to variations in rainfall, temperature, subsurface soil conditions, soil permeability and other factors not evident at the time of the water level measurements.

FOUNDATIONS

Based on the results of this investigation it is our opinion that continuous and isolated footing foundations may be considered for support of new structure loads. These foundations can be supported on undisturbed natural soils located below all fill soils, low-strength soils, and other unsuitable conditions which may be encountered. Soil strength values and the depths at which they are expected to be encountered at these boring locations are indicated in the above table. A net allowable bearing value of 3,000 lbs./sq.ft. is available for design. This value can be used to size foundations for support of structure dead and live loads.

All exterior foundations should extend at least 48.0 inches below exposed surface elevations to provide adequate protection against uplift due to freezing of the supporting soils. We recommend providing adequate reinforcing steel in foundation walls and piers to minimize the effects of long-term differential settlement.

DEWATERING

Shallow excavations may require dewatering due to subsurface water seepage and/or surface precipitation. This water can be removed to depths of several feet by standard sump and pump operations. Soils exposed at foundation, slab or undercut elevations should not be permitted to become saturated. Loss of bearing strength and stability may occur, requiring additional soil excavation.

Aggressive dewatering efforts will be necessary for excavations extending to the saturated granular materials. Well-points or deep sumps can be utilized to collect the water for pumping in an effort to lower the water level below the bottom elevation of proposed excavations. The dewatering should be accomplished prior to soil excavation when possible.

The loose granular fill and non-cohesive soils will be unstable. These soils tend to cave or run when submerged or disturbed. The stability of exposed embankments is minimal to non-existent as confining soil pressures are removed. Proper drainage within excavations is necessary at all times, particularly when excavations extend below anticipated water levels and below saturated soils.

The contractor should be made responsible for designing and constructing stable temporary excavations. Also, the contractor should shore, slope, bench or restrain the sides of the excavations as required to maintain stability of both the excavation sides and bottom. In no case, should the slope, slope heights, or excavation depth exceed those in the local, state, and federal safety regulations.

SUBGRADE SOIL PREPARATION

The procedure in all areas of subgrade supported improvements should include the removal of unsuitable surface conditions including vegetation, topsoil, significant debris, weak or unstable soils, and other deleterious conditions which may be encountered. Above grade areas should be cut to design subgrade elevations. Exposed subgrade soils should be leveled, compacted and proof-rolled in the presence of the Soil Engineer.

Proof-rolling may reveal areas of unstable soil conditions, requiring additional removal. Soft or unstable soil conditions in pavement areas can often be bridged by use of an effective depth of crushed granular material. The placement of the crushed granular bridging material, possibly in conjunction with the use of an appropriate geotextile fabric, should only proceed after review of the proof-roll conditions by the Soil Engineer. Long-term settlement of pavement surfaces may occur locally as the bridged soils desiccate.

Structural fill can be placed on soils prepared to the satisfaction of the Soil Engineer. The fill should be placed in lifts not to exceed 8.0 inches when uncompacted. Each lift should exceed minimum compaction requirements prior to placement of the next lift. We recommend a minimum of 95% compaction based on the modified Proctor test, ASTM D-1557, be achieved within building areas. A minimum of 90% compaction should be achieved beneath exterior improvements such as pavements and sidewalks. Compaction requirements also apply to

backfill placement around foundations and within trench excavations located below subgrade supported improvements.

CONCLUSION

The information within this report is intended to provide initial information concerning subsurface soil and water conditions on the site. Variations in subsurface conditions are expected to be present due to naturally changing and disturbed soil conditions.

Our understanding of the proposed improvements is based on limited information available to us at the writing of this report. The findings of the investigation and the recommendations presented are not considered applicable to significant changes in the scope of the improvements or applicable to alternate site uses. We recommend that proposed foundation, pavement and grading plans be reviewed by our office to determine if additional considerations are necessary to address anticipated subsurface conditions. Soil conditions encountered at foundation elevations are recommended to be tested to verify the presence of design soil strength prior to concrete placement.

If you have any questions concerning the findings or recommendations presented in this report, please let us know.

Very truly yours,

SOIL AND MATERIAL CONSULTANTS, INC.



Thomas P. Johnson, P.E.
President

TPJ:ek
Enc.



SMC	SOIL AND MATERIAL CONSULTANTS, INC.	LOCATION SKETCH
Client:	CIORBA GROUP	
Project:	CHATHAM LIFT STATION	
Location:	BUFFALO GROVE, IL	
File No.	24537	Date: 5-21-19
		Scale: NONE



SOIL AND MATERIAL CONSULTANTS, INC.

8 W. COLLEGE DR. • SUITE C • ARLINGTON HEIGHTS, IL 60004

SOIL BORING LOG 1

Logged By: CS Page: 1 of 1

Client: Ciorba Group

File No. 24537 Date Drilled: 5/21/19

Reference: Chatham Lift Station
Buffalo Grove, IL

Comments:

depth, ft.	Equipment: <input checked="" type="checkbox"/> CME 45B <input type="checkbox"/> CME 55 <input type="checkbox"/> Hand Auger <input type="checkbox"/> Other
	CLASSIFICATION
	Elevation 99.6' Existing Surface
	(a) see below
	Brown-dark brown-black-gray silt, some clay, trace sand & gravel, damp, med. dense Fill
5	Dark brown-black-gray clay, some silt, trace sand & gravel, damp, very tough - Fill
	Crushed gravel, saturated, very loose to loose - Fill
10	
15	
20	
25	
30	
	Medium-coarse sand, some fine sand & gravel, saturated, loose - Possible Fill
35	
	Gray silt, some clay, trace fine sand, very damp, medium dense
40	

standard penetration	moisture content	dry unit weight lbs./cu.ft.	unconfined compressive strength	unconfined compressive strength, tons/sq. ft.	penetrometer reading, tons/sq. ft.
X	Δ	γ	○	1.0 2.0 3.0 4.0	1.0 2.0 3.0 4.0
				× standard penetration "N", blows/ft. Δ moisture content, %	
				10 20 30 40	
	27.2				
11	17.8				
8	23.5	99.2	2.0		
7	17.0	113.4	2.8		
4	10.1				
4	11.3				
3	8.2				
3	10.6				
3	10.4				
6	5.7				
9	11.5				
15	20.8				

(a) Black silt, some clay, trace sand and roots, damp (topsoil) - Fill

Water encountered at 8.5 feet during drilling operations (W.D.)

Wet Cave-In Water recorded at 7.5 feet on completion of drilling operations (A.D.)

Water recorded at _____ feet _____ hours after completion of drilling operations (A.D.)



GENERAL NOTES

SAMPLE CLASSIFICATION

Soil sample classification is based on the Unified Soil Classification System, the Standard Practice for Description and Identification Soils (Visual-Manual Procedure), ASTM D-2488, the Standard Test Method for Classification of Soils for Engineering Purposes, ASTM D-2487 (when applicable), and the modifiers noted below.

CONSISTENCY OF COHESIVE SOILS

<u>Term</u>	<u>Qu-tons.sq.ft.</u>	<u>N (unreliable)</u>
Very soft	0.00 – 0.25	0 – 2
Soft	0.26 – 0.49	3 – 4
Stiff	0.50 – 0.99	5 – 8
Tough	1.00 – 1.99	9 – 15
Very Tough	2.00 – 3.99	16 – 30
Hard	4.00 – 7.99	30 +
Very Hard	8.00 +	

RELATIVE DENSITY OF GRANULAR SOILS

<u>Term</u>	<u>N – blows/foot</u>
Very Loose	0 – 4
Loose	5 – 9
Medium Dense	10 – 29
Dense	30 – 49
Very Dense	50 +

IDENTIFICATION AND TERMINOLOGY

<u>Term</u>	<u>Size Range</u>
Boulder	over 8 in.
Cobble	3 in. to 8 in.
Gravel - coarse	1 in. to 3 in.
- medium	3/8 in. to 1 in.
- fine	#4 sieve to 3/8 in.
Sand - coarse	#10 sieve to #4 sieve
- medium	#40 sieve to #10 sieve
- fine	#200 sieve to #40 sieve
Silt	0.002 mm to #200 sieve
Clay	smaller than 0.002mm

<u>Modifying Term</u>	<u>Percent by Weight</u>
Trace	1 – 10
Little	11 – 20
Some	21 – 35
And	36 – 50

Moisture Content

Dry
 Damp
 Very Damp
 Saturated

DRILLING, SAMPLING & SOIL PROPERTY SYMBOLS

CF	- Continuous Flight Auger
HS	- Hollow Stem Auger
HA	- Hand Auger
RD	- Rotary Drilling
AX	- Rock Core, 1-3/16 in. diameter
BX	- Rock Core, 1-5/8 in. diameter
NX	- Rock Core, 2-1/8 in. diameter
S	- Sample Number
T	- Type of Sample
J	- Jar
AS	- Auger Sample
SS	- Split Spoon (2 in. O.D. with 1-3/8 in. I.D.)
ST	- Shelby Tube (2 in. O.D. w/ith 1-7/8 in. I. D.)
R	- Recovery Length, in.
B	- Blows/6 in. interval, Standard Penetration Test (SPT)
N	- Blows/foot to drive 2 in. O.D. split-spoon sampler with 140 lb. hammer falling 30 in., (STP)
Pen.	- Pocket Penetrometer readings, tons/sq.ft.
W	- Water Content, % dry weight
Uw	- Dry Unit Weight of soil, lbs./cu.ft.
Qu	- Unconfined Compressive Strength, tons/sq.ft.
Str	- % Strain at Qu.
WL	- Water Level
WD	- While Drilling
AD	- After Drilling
DCI	- Dry Cave-in.
WCI	- Wet Cave-in.
LL	- Liquid Limit, %
PL	- Plastic Limit, %
PI	- Plasticity Index (LL-PL)
LI	- Liquidity Index [(W-PL)/PI]



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May 22, 2019
File No. 24537

Mr. Luke A. Mattson, P.E.
Ciorba Group
8725 W. Higgins Road, Suite 600
Chicago, IL 60631

Re: pH Test Result
Chatham Lift Station
Buffalo Grove, Illinois

Dear Mr. Mattson:

A selected soil sample collected between a depth of 3.5 feet and 5.0 feet from boring B-1, shown on the attached sketch, was tested in accordance with ASTM D 4972-01 and had a pH level 8.1.

If you have any questions do not hesitate to contact me.

Very truly yours,

SOIL AND MATERIAL CONSULTANTS, INC.

Thomas P. Johnson, P.E.
President

TPJ:ek
Enc.

8 W. COLLEGE DR. • SUITE C • ARLINGTON HEIGHTS, IL 60004

SOIL BORINGS • SITE INVESTIGATIONS • PAVEMENT INVESTIGATIONS • GEOTECHNICAL ENGINEERING
TESTING OF • SOIL • ASPHALT • CONCRETE • MORTAR • STEEL

--- END OF SECTION ---

**DEMOLITION
SECTION 02 41 00**

PART 1 – GENERAL

1.01 SCOPE

A. This work shall consist of the selective demolition of equipment, piping and electrical and mechanical system from the wet well and dry well; sidewalk removal; curb removal; pavement removal; wet well concrete fill; wet well benching / patching / plugging; generator removal.

B. Wet Well Demolition:

1. Equipment, piping and other materials to be removed from the wet well include, but are not limited to:
 - a. The existing bubbler, sump discharge, and pressure transducer lines / conduit including all tees, elbows and other fitting.
 - b. The existing pump suction line that shall be plugged with 2' of non-shrink concrete / mortar plug.
2. Holes left at the bottom and the sides of the wet well walls shall be sealed with a high performance, non-metallic, non-shrink cementitious grout such as SikaGrout 212 or approved equal. Otherwise the existing wet-well structure will remain and efforts will be made to protect the structure from damage.
3. The bottom 7.9-feet of the wet well shall be filled with concrete and shall be re-benched per the material requirements of 03 00 00, and the details shown on the demolition plan.

C. Dry Well Demolition

1. Equipment and piping to be removed from the dry well include, but are not limited to:
 - a. Existing pumps, valves, piping and controls.
 - b. Existing sump pumps and discharge lines.
 - c. The entrance tube maintenance lift.
 - d. All lighting fixtures, heaters, dehumidifier, compressors, switches, and blowers including brackets and electrical components.
 - e. Disconnection of the electrical service.

- f. The existing pump suction line and force main discharge lines that shall be plugged and mechanically capped.
2. After removal from the dry well the PLC controls, level controls and flow meter equipment shall be turned over to the Village Public Works Department.
3. After selective demolition, the entrance tube shall be removed a minimum depth of 5-foot below existing grade or as deep as needed to accommodate the final proposed site improvements. The controlled low strength material shall be Mix 1 with work performed in accordance with Article 593 of the SSRBC. The contractor include venting as needed in order to completely fill the abandoned in place dry well to eliminate voids. Backfill remaining excavation with in-situ site material or bedding as required for proposed site components. The remainder of the stripped dry well vessel shall be filled with controlled low strength material (flowable fill).

D. Other Demolition

1. Remove electrical service meter and emergency cutoff switch. Conductors feeding meter shall also be removed after the new electrical service is energized.
2. Abandon existing data service to dry well.
3. Remove automatic transfer switch, generator, generator housing, and generator pad.
4. Abandon existing 14" force main between the existing wet well and the point of connection of the new force main. Abandoned force main shall be plugged at both ends with a minimum 2-foot long non-shrink concrete / mortar plug.
5. Full depth sawcut and remove sidewalk, curb and gutter, and pavement as shown on the demolition plan.

E. Basic Procedures and Schedule: Carry out demolition so that adjacent structures, which are to remain, are not endangered. Schedule the work so as not to interfere with the day to day operation of the existing facilities. Do not block doorways or passageways in existing facilities.

F. Additional Requirements: Provide dust control for existing and new equipment protection and make provisions for safety.

1.02 SCHEDULING

- A. Perform Work in manner which will provide least interference and most protection to public and existing construction. Contractor's operations subject to approval by Owner prior to commencement of Work.
- B. Carefully coordinate time and manner of demolition work with Engineer to assure continued operation of existing facilities and to maintain construction schedule requirements.
- C. Owner's use of premises shall have priority over work in all Contract(s).
- D. Minimize outages of electrical systems.
- E. Coordinate electrical system outages with Owner and service utility. Notify Owner in writing at least 24 hours prior to electrical outage. Indicate system to be disabled, areas affected, proposed date and time of outage, duration, and work to be performed.
- F. Outages of following electrical systems shall be performed only with written permission of Owner.
 - 1. Power distribution.
 - 2. Fire alarm.
 - 3. Telephone.

1.03 SUBMITTALS

- A. The Contractor shall submit to the Owner for review a description of demolition operations and procedures, data and information pertaining to the demolition Work and as herein specified. Submittals shall include product specifications and descriptions, and drawings (when necessary) showing details together with related accessories. All submittals shall comply with the applicable requirements of Section 01 33 00.
- B. The Contractor shall submit a schedule in compliance with Part 1.02 of this Section.
- C. The Contractor shall submit material test reports on samples of all fill and backfill.
- D. The Contractor shall submit a material in-situ compaction test report for backfill required by the demolition operations.
- E. Provide submittals as required during utility identification, relocates and protection. Provide submittals as required by the utility involved and / or having

jurisdiction. Submittals shall be directly to the utility involved with copy to the Engineer.

1.04 QUALITY ASSURANCE

A. Utility Identification, Relocate and Protection

1. Perform all Work of this Section in accordance with the applicable requirements of codes and standards of the agency / utilities involved. Comply with IDOT Standard Specifications (Sections 105.07 and 107.31) for Cooperation with Utilities and Contractor Responsibility.

B. Retain services of a qualified professional soils consultant and testing laboratory. Responsibilities of soils consultant will include:

1. Sampling, testing, and approval of fill or backfill materials prior to and during placement.
2. Sampling and testing to determine moisture-density, maximum density and relative density characteristics of materials.
3. Observation of placement, selection of test locations and testing of material during placement to determine that specified compaction requirements are met.
4. Provide reports to Owner giving information on materials and testing performed.
5. Bind all reports and recommendations in one report at end of Project and submit to Owner.
6. Soils consultant shall provide evidence of professional registration in state where Work is performed and Professional Liability Insurance covering its activities in investigation, evaluation and production of reports dealing with subsurface soils investigations.

C. Temporary electrical construction necessary to maintain existing system during construction shall comply with NEC Article 590.

D. Regulatory requirements:

1. Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction. Obtain and pay for all permits required.

2. Conform to applicable requirements of state, and other governmental agencies for demolition work.

1.05 SITE CONDITIONS

- A. Known underground piping, foundations, and other underground obstructions in vicinity of new construction are shown on Drawings.
- B. Protect underground facilities encountered during excavation until it is determined whether they are active or inactive. Repair, without compensation, existing active facilities shown on Drawings damaged during operations.
- C. Notify Engineer and Owner of unexpected subsurface conditions and discontinue Work in area until Owner provides notification to resume Work.

PART 2 – PRODUCTS

2.01 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain property of Owner, demolished materials shall become Contractor's property and shall be removed, recycled, or disposed from Project Site in appropriate and legal manner.

2.02 CONTROLLED LOW STRENGTH MATERIAL

- A. The Contractor shall submit to the Engineer a mix design for the flowable fill used on the project. The mix design shall generally conform to the following mix as designed by Prairie Material Mix #6115811, or as approved by the Engineer:

Cement:	80 Pounds
Fly Ash:	910 Pounds
Sand:	1850 Pounds
Water:	54.7 Gallons
A/E:	1 – 25%
Slump:	10 ± 1"

PART 3 – EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Inspect structures where demolition is required. Inspect existing Drawings of buildings and structures; Drawings are available from Owner.
- B. Perform excavation and dewatering necessary to accomplish Work.

- C. Determine actual Site conditions, extent to which demolition is required, and method of demolition.
- D. Schedule work with Owner and work in other parts of these Contract Documents.
- E. Perform surveys as required prior to demolition and as Work progresses to detect hazards resulting from demolition activities.

3.02 PREPARATION

- A. Conduct demolition operations and remove C&D materials to ensure minimum interference with roads, streets, walks, and other adjacent occupied and utilized facilities.
- B. Do not close or obstruct streets, walks, or other adjacent occupied or utilized facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
- C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.
- D. Protect existing Site improvements, appurtenances, and landscaping that are designated to remain in place.

3.03 UTILITY IDENTIFICATION, RELOCATES AND PROTECTION

- A. Active utilities which do not interfere with the Work shall be supported and protected from damage. After Engineer review and obtaining the utility's approval, relocate or remove active utilities which will interfere with Work. The Contractor shall pay for all damage to active utilities and for relocation or removal of all interfering utilities which are ascertainable from Drawings, surveys or site inspection, including J.U.L.I.E meet to be scheduled by the Contractor.
- B. Inactive or abandoned utilities and appurtenant structures encountered shall be filled or removed to avoid interference as directed by the Owner's Representative and/or the Utility. Exposed ends of abandoned lines shall be plugged or capped in a water-tight manner.

3.04 EXPOLOSIVES

- A. Explosives: Use of explosives not permitted.

3.05 DEMOLITION – GENERAL

- A. Below-grade construction: Demolish foundation walls and other below-grade construction, as follows:
 - 1. Pipes abandoned in place shall be cut and capped as indicated on drawings.
 - 2. Any below-grade valves demolished shall be removed, and remaining pipe cut and capped.
 - 3. Below-grade areas: Completely fill below-grade areas and voids resulting from demolition operations to street level with satisfactory soil materials.
- B. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
- C. Remove existing construction as specified and shown and as required to permit new construction.
- D. Perform removal in manner that will minimize dust, noise, and other nuisance. Maintain haul routes for disposal of material clean and free of debris.
- C. Remove existing construction carefully providing for neat and orderly junctions at construction to remain in place. Final appearance of exposed surfaces shall be similar and equal to that of adjacent existing work. Grind off rough surfaces to remove sharp projections.
- D. Any portion of existing construction whether structural, or accessory which has become unstable through removal of other parts of construction shall be removed as soon as practicable, and no such unstable part shall be left free-standing or inadequately braced against causes of collapse at end of each day's work.
- E. No demolition shall be performed on piping, electrical circuits, or equipment until system has been isolated by owner of the utility. Contractor shall verify isolation of system.
- F. Contractor shall relocate existing active miscellaneous piping, conduit, and electrical circuits and devices not detailed on Drawings but required for installation of equipment and items installed by this Contract.

3.06 DEMOLITION OF MECHANICAL ITEMS

- A. Remove mechanical equipment and materials as shown on Drawings and as specified.

- B. Removal shall include but not limited to piping, valves, equipment, hangers, and associated accessories.

3.07 DEMOLITION OF ELECTRICAL ITEMS

A. Examination:

1. Verify that abandoned wiring and equipment serve only abandoned facilities.
2. Demolition drawings are based on cursory field observation and existing record documents. Report discrepancies to Owner before disturbing existing installation.

B. Preparation:

1. Before beginning underground demolition, contact Owner, and local utilities locating service JULIE at least 24 hours before digging.
2. Contact Owner to determine equipment items are to be salvaged and delivered to storage area. Other equipment shall become property of Contractor and shall be removed from job site.
3. Coordinate utility service outages with utility company.
4. Provide temporary wiring and connections to maintain existing systems in service during construction.
5. Existing electrical service: maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system.

C. Demolition and extension of existing electrical work:

1. Remove, relocate, and extend existing installations to remain to accommodate new construction.
2. Remove abandoned wiring to source of supply.
3. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed.
4. Disconnect and remove following:

- a. Abandoned panelboards and distribution equipment.
 - b. Devices and equipment serving utilization equipment that has been removed.
 - c. Abandoned light fixtures, including brackets, stems, hangers, and other accessories.
5. Repair adjacent construction and finishes damaged during demolition and extension work.
 6. Maintain safe access to existing electrical installations which remain active.

3.08 HANDLING OF DEMOLISHED MATERIALS

- A. Salvageable materials, except items specified to remain property of Owner, shall become property of Contractor and shall be removed from Site as Work progresses.
- B. Promptly re-use, salvage, recycle, or dispose of demolished materials. Do not allow demolished materials to accumulate or be stored on-site for more than 5 days.
- C. Certain equipment and material shall be removed and reinstalled as indicated on Drawings and specified herein. Contractor shall remove such items, store if required, and reinstall as indicated. In event of loss or damage to such material or equipment, Contractor shall replace items without additional cost to Owner.
- D. Storage of materials to be removed not permitted to accumulate on site. Promptly remove and dispose of unsalvageable equipment and materials.
- E. Burning: Do not burn demolished materials. F. Debris shall not be allowed to accumulate on roofs, floors, or in areas outside of and around any buildings being removed. Waste materials and debris resulting from Work shall be removed and disposed of daily by Contractor in disposal area obtained by Contractor.
- F. No material, obstructions, or debris shall be placed or allowed to accumulate within 15' of any fire hydrant. Fire hydrants shall be accessible at all times.

3.09 DISPOSAL OF MATERIALS

- A. Transport demolished materials from construction sites and legally recycle or dispose of materials.

- B. Special Waste and Hazardous Materials: If special waste and/or hazardous materials are encountered in areas other than those indicated on the Drawings during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

3.10 REPAIR AND RESTORATION

- A. Contractor shall be responsible for damage to personnel, public, roadways, streets, structures, utilities, facilities, and equipment caused by operations and shall repair any damage at its own expense or replace items damaged beyond repair.
- B. Do not operate vehicles or equipment on existing construction or roadways that could be damaged.
- C. Backfill applicable excavated areas, open pits, and other depressions as work progresses. Backfill materials shall conform to requirements of Drawings and other specification sections.
- D. Grade areas disturbed by construction to smooth, uniform surfaces sloped to drain.
- E. Replace construction removed to facilitate operations with construction of equal quality to that removed.

3.11 CLEAN-UP

- A. Maintain public streets, alleys, or other thoroughfares used in carrying out disposal free of litter or soil attributable to this operation. Equip and load trucks or other vehicles to prevent leakage, blowing off, or other escape of any portion of whatsoever is being hauled. Cost incurred by Owner in cleaning up such litter will be charged to Contractor and deducted from monies due or to become due it under this contract.
- B. Upon completion of demolition work in each area, thoroughly clean area of materials not to remain.
- C. Remove materials (except paint) adhered to construction to remain.
- D. Leave areas in broom clean and vacuumed condition.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum price for DEMOLITION.

--- END OF SECTION ---

CONCRETE WORK SECTION 03 00 00

PART 1 – GENERAL

1.01 SUMMARY

This Section specifies precast and cast-in-place concrete including formwork, reinforcing steel, and miscellaneous materials. Specific items related to the project include:

- A. Wet well top slab with integrally cast flush mount sleeve for confined space davit, and access hatch.
- B. Wet well.
- C. Valve / meter / bypass vault with integrally cast flush mount sleeves (2) for confined space davit, and access hatches (2).
- D. Concrete traffic box enclosure pad.
- E. Concrete generator pad.

1.02 SUBMITTALS

A. Precast Items:

- 1. Provide cut sheets for wet well flat top slab and wet well conforming generally to standard ASTM C478 manholes. Slab shall be 10" thick and of suitable diameter to match the proposed wet well.
- 2. Provide other cut sheets for any other items listed in Section 1.01 that will be constructed as a precast item.

B. Quality assurance data:

- 1. Tests, or certificates of compliance with standards specified in this Section at least 14 days prior to commencing concrete placement for:
 - a. Cement: From each car from which cement will be used.
 - b. Fly ash: From each separate shipment from which fly ash is being used.
 - c. Aggregates: For each size aggregate from each source of aggregate, for grading, deleterious substances and soundness.

2. List of admixtures, joint fillers, sealants, curing compounds, and other manufactured materials proposed identifying manufacturer and type. Provide data on specific items when requested by Engineer.
3. Testing laboratory reports required at least 14 days prior to commencing concrete placement for each class of concrete and each size aggregate:
 - a. Proposed concrete design mix.
 - b. Tests on concrete cylinders from trial batch of proposed mix.
4. Testing laboratory reports for tests on concrete cylinders taken in field.

1.03 QUALITY ASSURANCE

- A. Contractor shall retain services of qualified independent testing laboratory.
- B. Responsibility of testing laboratory will include:
 1. Obtaining, making samples and trial batches and performing laboratory and field testing specified.
 2. Provide reports to Engineer giving information on materials, concrete design mixes and testing performed.
 3. Reports shall indicate whether or not materials meet specifications.
- C. Perform Work in accordance with ACI 117 and 301.
- D. Tests:
 1. Establish proposed concrete design mix proportions on basis of either field experience and/or trial mixtures in accordance with ACI 318, Chapter 5, except specific requirements shall conform to requirement of these specifications. Determine and submit supporting data, standard deviation, trial batch tests, required average strength, proportions, air content, and slump range for each mix.
 2. Concrete strength tests:
 - a. Comply with ASTM C39 for testing and ASTM C31 or C192 for preparation of cylinders.
 - b. Field tests: Sample in accordance with ASTM C172; make and test 3 cylinders from each sample on basis of not less

than one sample from each day's placement for each class of concrete.

- c. Cylinders shall be laboratory cured. Test one laboratory cured cylinder at 7 days and other two at 28 days for average strength.
- d. If tests indicate deficient strength as defined by ACI 318, immediately adjust mix to increase average of subsequent test results and, when directed, perform drilled core testing, ASTM C42. Testing and remedial work shall be at no additional cost to Owner.

3. Slump tests:

- a. Test each batch as delivered; comply with ASTM C172 and C143.
- b. If slump exceeds Specifications, promptly remove batch from Work and dispose of off-site at location selected by Contractor. Do not add water in excess of specified water-cement ratio to batch to achieve desired slump.

4. Air content tests:

- a. Sample on basis specified above for field strength tests.
- b. Obtain samples from concrete after it has been placed and consolidated.
- d. Determine air content by pressure method; comply with ASTM C231.
- c. If air content does not meet Specifications, remove deficient concrete from Work.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Cement: Keep clean, dry, and free from weather damage.
- B. Aggregates: Stockpile each gradation separately on clean, noncontaminating surface.

PART 2 – PRODUCTS

2.01 WET WELL PRECAST CONCRETE FLAT TOP

- A. The pump station wet well flat top shall be a new precast concrete flat top conforming to standard ASTM C478 manholes. Diameter shall be a suitable match for the diameter of the proposed wet well. New flat top shall have the access frame and hatch cast into the top and frame shall be flush with the top of the concrete.

2.02 WET WELL

- A. The wet well base and riser shall conform to Standard ASTM C478 manholes. Base slab thickness shall be a minimum of 12" with a 12" flange extension. Minimum wall thickness of the barrel section shall be 8". Outside surface shall be waterproofed with 2 coats of asphalt emulsion.

2.03 CEMENT

- A. Portland cement: ASTM C150, Type I.
- B. High-early-strength Portland cement: ASTM C150, Type III. May be used instead of Type I cement at Contractor's option, unless specified otherwise, to achieve 28-day strength at 7 days. Do not use in concrete where least dimension of concrete section exceeds 3'-0" (900 mm).
- C. White cement: Nonstaining, ASTM C150, Type I.
- D. Use only one brand of each type of cement.

2.04 AGGREGATE

- A. Regular aggregate: Strong, durable, well-graded minerals conforming to ASTM C33 requirements for grading, deleterious substances and soundness.
- B. Aggregates not conforming exactly to above specifications may be used provided special tests or actual service establish that such aggregates will produce concrete of quality specified.
- C. Coarse aggregate nominal size:
 - 1. 1-1/2" to No. 4: Use for all concrete unless specified otherwise.
 - 2. 3/4" to No. 4: Use for slabs and thin sections and areas where clear spacing between reinforcing bars is less than 3".

2.05 FLY ASH

- A. Conform to ASTM C618.

- B. Fly ash for total Project shall be obtained from single source.
- C. Design concrete mixes to include fly ash in amount of approximately 15% to 20% of cement by weight.
- D. May be used at Contractor's option for all concrete.

2.06 WATER

- A. Clean, fresh, free from injurious amounts of oil, alkali, acid, salts, organic materials, or other substances that may be deleterious to concrete or steel. Mix water shall comply with ASTM C1602.

2.07 ADMIXTURES

- A. Water-reducing and set-controlling admixture, ASTM C494, type as required. Use for all concrete.
- B. Air entraining agent, ASTM C260. Use in accordance with manufacturer's recommendations.

2.08 REINFORCING

- A. Bars: ASTM A615, Grade 60 (420) deformed bars.
- B. Bend bars cold to conform to required details.
- C. Welded wire fabric: ASTM A185 plain wire in coiled rolls.

2.09 FORMS

- A. Acceptable materials:
 - 1. Douglas fir, exterior type, concrete form plywood, 5/8" thick minimum, conforming to DOC PS 1, Grade B-B, Class I or II.
 - 2. Removable metal forms with surfaces equal to Douglas fir, exterior type, concrete form plywood.
 - 3. Fiber tube forms: Cylindrical fiber reinforced forms.
- B. Form ties: Type leaving no metal within 1" of finished surface after removal of forms.
- C. Form coating:

1. Wood forms: Nonstaining mineral oil or commercially produced form-release agent that will not bond with, stain, or adversely affect concrete surfaces and curing, and will not impair bond or adhesion of subsequent treatment of concrete surfaces, "Nox-Crete Form Coating," by Nox-Crete Chemicals, or equal.
2. Metal forms: Treat surfaces as recommended by manufacturer before placing reinforcing.
3. Fiber tube forms: Treat surfaces as specified for wood forms or as recommended by manufacturer.

2.10 CURING MATERIALS

A. Liquid membrane-forming compound:

1. ASTM C309, Type 1 with fugitive dye, except Type 2 with white pigment for surfaces exposed to direct rays of sun.
2. Do not use compounds containing wax, oil, resin, varnish, or other bases that will prevent bonding of finishes such as floor coverings, tile, additional concrete, paint, and similar applied finishes.
3. Use for curing at Contractor's option except where other products are specified for particular application.

B. Plastic film:

1. Polyethylene plastic film, white, nonstaining, conforming to ASTM D2103.
2. Minimum 4-mil thickness.
3. Use for curing at Contractor's option except where other products are specified for particular application.

C. Absorptive mat:

1. Cotton fabric, burlap fabric, or burlap-polyethylene material woven or bonded to prevent separation.
2. Material shall be clean and nondetrimental to concrete or finish.
3. Use for curing at Contractor's option except where other products are specified for particular application.

2.11 GROUT

A. Regular grout:

1. One part Portland cement to three parts fine aggregate with sufficient water to maintain adequate workability. Substitute white cement for normal Portland cement to match color of adjacent concrete.
2. Minimum strength: 4,000 psi at 28 days.
3. Use for patching.

B. Nonshrink grout:

1. Nonmetallic and free of chloride, gypsum or corrosive-type materials; ASTM C1107, Grade A; formulation suitable for application.
2. Minimum strength: 5,000 psi at 28 days.
3. Use for grouting beneath baseplates.

2.12 CONCRETE DESIGN AND USE

A. Each concrete design mix shall be established in strict accordance with ACI 318 by proportioning on basis of either experience and/or trial mixtures.

B. Strength classifications:

1. Class A:

- a. Compressive Strength (f'_c) = 4,000 psi.
- b. Required Average Compressive Strength (f'_{cr}) = 5,200 psi.

C. Required average compressive strengths: Produce concrete of average strengths noted above unless test results substantiate a lower permissible average strength based on standard deviation criteria set forth in ACI 318. Strengths listed above are 7-day strengths for concrete using high-early-strength cement and 28-day strengths for concrete using other type cements.

D. Maximum water-cement ratio: 0.48% by weight. Where pozzolan fly ash is used, water-cement plus pozzolan ratio shall not exceed specified ratio.

E. Air entrainment: Concrete shall contain entrained air within following limits.

1. Nominal Maximum Size of Coars Aggregate = $\frac{3}{4}$ "

- a. Total Air Content, Percent By Volume = 4 – 8%
- 2. Nominal Maximum Size of Coarse Aggregate = 1-1/2”
 - a. Total Air Content, Percent By Volume = 3 – 6%

F. Workability:

- 1. Proportions of concrete shall produce a mixture, suited to placement methods, which will work readily into corners and angles of forms and around reinforcement and embedded items. Segregation of materials or presence of free water will not be permitted.
- 2. Slump of concrete: Use minimum practical; vary within limits given to suit placement conditions; in no case is slump to be increased by addition of water in excess of design mix quantity:
 - a. Type of Construction
 - i. All concrete unless otherwise noted: Slump = 2 in Min, 5 in Max.
 - ii. Building Columns: Slump = 3 in Min, 5 in Max.

G. Class A concrete: Use for all concrete unless specified otherwise.

2.13 READY MIX CONCRETE

- A. Provide concrete from an established, approved ready-mix plant. Ready-mix plant equipment and facilities shall be certified in accordance with NRMCA QC-3.
- B. Equipment and methods: Conform to ASTM C94.

2.14 FLUSH MOUNT SLEEVE

- A. Provide flush floor mount sleeve, cast into the new wet well top slab. Sleeve shall be DBI / SALA model 8512828 of stainless-steel construction. Sleeve shall be equipped with heavy duty sleeve cap, model 8510827.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Construct forms strong, straight, adequately braced and securely fastened.

- B. Remove laitance from previously placed or existing concrete; thoroughly clean surface before placing additional concrete.
- C. Apply form coating on formwork in accordance with manufacturer's instructions. Apply prior to placing reinforcing steel, anchoring devices, and embedded items.

3.02 PLACING CONCRETE

- A. Clean transporting equipment, reinforcing, and embedded items before placing concrete. Remove water and debris from places to be occupied by concrete.
- B. Place no concrete until forms, reinforcing, and embedded items have been verified as adequately supported and accurately placed. Place no concrete over water-covered, muddy, or frozen soil.
- C. Immediately remove concrete where water, soils, or other deleterious substances are permitted to mix with concrete, form or embedded item movement occurs, or inadequate consolidation is obtained.
- D. Hot weather concreting:
 - 1. Applies to concrete placed when ambient temperature exceeds 90° F.
 - 2. Conform to ACI 305R recommendations and requirements.
- E. Cold weather concreting:
 - 1. Applies to concrete placed when ambient temperature is below 40° F.
 - 2. Conform to ACI 306R recommendations and requirements.
 - 3. If temporary heating facilities used are of type which produce an atmospheric condition of high carbon dioxide content, seal off concrete in such manner that no damage will result to concrete surface.
- F. Employ best industry practices to prevent segregation during placing. Do not drop concrete more than 5' (1500 mm). Use tremied or pumped concrete to provide proper placement. Place in layers approximately 18" (450 mm) deep.
- G. Place concrete continuously in each section until completed. Permit not more than 30 minutes between depositing adjacent layers of concrete within each section, unless an acceptable set retarder is used in concrete mix.
- H. Thoroughly compact, puddle, and vibrate concrete into corners and around reinforcing and embedded items. Use internal vibration where size of section permits.

- I. Maintain concrete placing temperature between 50°F and 90°F except as specified for hot and cold weather concreting.
- J. Place sections of concrete in sequence that eliminates shrinkage effects to greatest extent practicable.
- K. Protect concrete from injury due to sun, cold weather, running water, construction operations, and other causes until properly cured.

3.03 REINFORCEMENT PLACEMENT

- A. Remove scale, loose flaky rust, dirt, grease, curing compound, and other coatings that would impair bond.
- B. Install slab-reinforcing bars in correct position by use of preformed bolsters and spacers, except concrete blocks may be used to position bars in concrete placed on grade. Concrete block shall have compressive strength equal to that of surrounding concrete.
- C. Space bars properly, and tie securely in position before placing concrete. Tack welding to keep reinforcing in place is not permitted.
- D. Lap wire fabric not less than 8".
- E. Welding of reinforcing bars: Conform to AWS D1.4.

3.04 CONSTRUCTION JOINTS

- A. Install only where shown or where specifically permitted.
- B. Provide keyway 1-1/2" deep covering approximately 1/3 area of construction joint, unless shown otherwise.
- D. A delay, until concrete is no longer plastic, shall occur after placing concrete for columns or walls before placing concrete for slabs, beams, or girders supported thereon.
- C. Slabs-on-grade: Place concrete in continuous side-by-side strips. Saw-cut control joints as soon as practicable after concrete hardens. Allow initial shrinkage of concrete to take place (ideally 90-120 days) before applying sealant.

3.05 EMBEDDED ITEMS

- A. Install items required under this contract to be embedded in concrete including structure steps at 16" centers. Install items required by others for embedding in concrete, if so instructed before placing concrete.
- B. Fasten embedded items securely in proper position before placing concrete.
- C. Conduit or pipe embedded in slabs or walls.
 - 1. Locate in center of slab or wall and space not closer than 3 diameters on center; locate to avoid impairing strength of concrete.
 - 2. Coordinate placing of reinforcing with conduit or pipe location. Do not cut reinforcing to clear conduit or pipe.
- D. Valve Vault Ventilation Pipe.
 - 1. Final location shall be determined during the submittal process.
 - 2. Pipe shall be 3" threaded galvanized steel with long radius 90° fitting for gooseneck downward turning outlet and stainless-steel insect screen 2-feet above finished grade. Sand, clean, and apply primer and topcoat of rust prevention black paint.
- E. Aluminum pipe shall not be embedded in concrete. Where aluminum projects into or rests against surface of concrete, coat surfaces of aluminum to prevent direct contact with concrete.

3.06 GROUTING

- A. Roughen concrete surfaces by light chipping to remove laitance to approximately 1/2". Do not expose reinforcing steel.
- B. Remove materials which might interfere with bond; prepare surfaces in strict conformance to manufacturer's instructions.
- C. Mix, place, and cure grout in strict accordance to manufacturer's instructions.
- D. Remove shims after grout is placed. Fill shim voids with grout.

3.07 FINISHING

- A. Flatwork:
 - 1. Tamp concrete to force coarse aggregate down from surface.

2. Screed with straightedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains.
3. Dusting of surface with dry cement or sand during finishing operations is not permitted.
4. Apply curing compounds and similar materials in accordance with manufacturer's instructions during or after finishing.
5. Finish surfaces within following tolerances as measured with a 10' straightedge:
 - a. Slabs: 3/16".
 - b. Top surfaces of structures other than slabs: In accordance with ACI 117.
6. Float finish:
 - a. Float surface to true, even plane.
 - b. Float second time to uniform finish with wood or cork float; use edger on exposed edges.

B. Formed surfaces:

1. Remove fins, projections, and loose material.
2. Clean surfaces of form oil.
3. Patch honeycomb, aggregate pockets, voids, and holes as follows:
 - a. Chip out until sound concrete is exposed to minimum depth of 1".
 - b. Prepare patching mortar with approximately 2 parts normal portland cement, one part white cement, 9 parts fine aggregate; vary proportions of cement as necessary to match color of adjacent concrete.
 - c. Saturate surfaces with water and fill cavities with patching mortar.
3. Fill holes left by form ties with patching mortar.
4. Cure patches as specified for concrete.

3.08 FORM REMOVAL

- A. Minimum time before removal after placing concrete, unless permitted otherwise:
 - 1. Footings: 24 hours.
 - 2. Walls, piers, and columns: 48 hours (24 hours for metal-lined forms).
 - 3. Self-supported beams and slabs: 14 days.
 - 4. Time specified above represents cumulative time during which temperature of concrete is maintained above 50°F and for concrete without set-controlling admixtures.
- B. Reduce removal time by half for high-early-strength cement concrete.
- C. In any event, do not remove supporting forms and shoring until concrete has acquired sufficient strength to safely support own weight plus construction loads.
- D. Take care when removing forms that concrete is not marred or gouged and that corners are true, sharp and unbroken.

3.09 CURING

- A. Cure all concrete; begin curing as soon as possible after placement of concrete.
- B. Use of liquid membrane-forming curing compound permitted for all concrete except where product would impair bond of other applied materials to surface or where other method of curing is specified for particular use.
- C. Plastic film curing:
 - 1. Dampen surface of concrete and lay plastic film with minimum 6" side laps and free of wrinkles; tape side laps.
 - 2. Hold film in place with lumber or use similar provisions to prevent exposure of concrete for 7 days after placing.
 - 3. Immediately repair tears in film.
- D. Water curing:
 - 1. Keep concrete continuously wet for seven days after placing.
 - 2. Use on concrete surfaces not receiving compound or plastic film curing.

3. Clean, nonstaining absorptive mat may be used with water curing.
4. Do not use for curing cold weather concrete.

3.10 MANHOLE TESTING

- A. All manholes shall be inspected and leakage tested in accordance with ASTM C1244-93 or C969-94. This work shall be included in the price of the manhole.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the WET WELL TOP SLAB, WET WELL, METER / VALVE / BYPASS VAULT, CONCRETE TRAFFIC BOX ENCLOSURE PAD or CONCRETE GENERATOR PAD.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for:

1. WET WELL TOP SLAB

- a. Includes all work in this specification as well as the spring assist access hatches specified in Section 08 10 00.

2. WET WELL

- a. Includes pouring of concrete fillets in wet well bottom.

3. METER / VALVE / BYPASS VAULT

- a. Includes all work in this specification as well as the spring assist access hatches and bypass connection specified in Section 08 10 00 and the filling of the bottom 1' of the vault with Class A Concrete as shown on the plans.

4. CONCRETE TRAFFIC BOX ENCLOSURE PAD

- a. Includes all work in this specification as well as earthwork and 8" of CA-6 compacted stone base course as shown on the plans.

5. CONCRETE GENERATOR PAD

- a. Includes all work in this specification as well as earthwork and 8" of CA-6 compacted stone base course as shown on the plans.

--- END OF SECTION ---

**ACCESS HATCHES
SECTION 08 10 10**

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section specifies factory fabricated aluminum access hatches for the Chatham Lift Station and fall protection retrofit for the Golfview Lift Station.

1.02 SUBMITTALS

- A. Provide submittals in accordance with Section 01 33 00.
- B. Product technical data: Manufacturer's data.
- C. Shop Drawings: Include profiles, accessories, location, and dimensions.

PART 2 - PRODUCTS

2.01 MAINTENANCE ACCESS HATCHES

A. Acceptable Manufacturers

- 1. EJ
- 2. U.S.F Fabrication
- 3. Or approved equal.

B. PERFORMANCE REQUIREMENTS – CHATHAM LIFT STATION

- 1. Wet well vault shall be double leaf. Valve and meter vaults shall be double leaf. Sizes shall be as indicated in the Drawings.
 - a) Hatches shall be lockable to prevent outside entry.
 - b) Wet well hatch shall have odor gaskets and debris gaskets.
 - c) Vault hatch does not require the odor gaskets or debris gaskets.
- 2. Performance characteristics:
 - a) Unit designed Heavy Duty, for 16,000 pounds plus 30% impact H-20 wheel loads, over a 10' x 20' contact area. Frame and bearing

must be cast into and supported by concrete designed for H-20 wheel loads.

- b) Operation shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
- c) Operation shall not be affected by temperature.
- d) Entire access hatch, including all hardware components, shall be corrosion resistant.

3. Cover: Minimum 1/4-inch thick 5086 aluminum diamond pattern.

4. Frame:

- a) Material shall be 6061-T6 Aluminum with a continuous 1-1/4" anchor flange.
- b) Dovetail groove shall be extruded into the seat of the frame for a 1/8" silicone gasket.

5. Hinges:

- a) Hinges shall be of heavy duty design. Material shall be Grade 316 Stainless steel. Each hinge shall have a grade 316 stainless steel 3/8" diameter hinge pin.
- b) Hinge shall be fastened to the channel frame and diamond plate with Grade 316 stainless steel bolts and NY-Lock Nuts.

6. Fall Protection:

a) Wet Well:

- i. The access opening shall have a permanently installed fall through protection grate system that provides continuous safety assurance in both its closed and open position. Single or double grate system shall be aluminum with an OSHA safety orange finish. Grates shall smoothly pivot on hinges 90 degrees upward and lock into place by hold open rods.

b) Valve Vault: Shall not require fall protection.

7. Gaskets:

- c) Debris gasket: continuous EPDM gasket mechanically fastened to the perimeter of the frame to reduce the amount of dirt and debris that enters the frame.

8. Lifting mechanisms:

- a) Unit shall be supplied with a heavy-duty pneumatic spring, for ease of operation when opening safety grate. Grate shall be counterbalanced, so one person can easily open the safety grate.

9. Hardware:

- a) Each hatch shall be equipped with a stainless steel hold open arm. Door shall lock open in the 90-degree position. Hold open arm shall be fastened to the frame with a 1/2" grade 316 stainless steel bolt.
- b) Each hatch shall be supplied with a stainless steel slam lock, with the key way protected by a threaded aluminum plug. The plug shall be flush with the top of the 1/4" diamond plate. The slam lock shall be fastened with Grade 316 stainless steel bolts and washers.
- c) Each hatch shall be equipped with a recessed padlock clip (padlock provided by others).
- d) Each hatch shall be equipped with a stainless steel lift handle. Lift handle shall be flush with top of 1/4" diamond plate.
- e) Each hatch shall be supplied with a 1-1/2" threaded drain coupler on the underside of channel frame, for pipe connection.

10. Finishes:

- a) Factory finish: mill finish aluminum
- b) Bituminous coating: apply to the exterior of the frame.

11. Hatch doors shall mount flush to the frame when in the closed and locked position.

12. Locks shall be provided for all hatches and shall be keyed alike. Four (4) sets of keys shall be provided. Locks provided shall be of the hasp type and keyed alike to the Village's existing code.

13. Signage shall be provided and securely fastened to the interior side of the access hatch advising that proper ventilation must be provided prior to entering; and that the area is considered to be a "confined

space” and as such proper precautions must be taken prior to entry. Signage shall be of a corrosion resistant material and shall be held in place by stainless steel fasteners. Signage shall be positioned such that when the hatch is opened the sign shall be in full view and easily legible.

C. PERFORMANCE REQUIREMENTS – GOLVIEW LIFT STATION

1. Fall Protection:

- a) Retrofit shall be made at the Golview Lift Station located at the southwest corner of S Buffalo Grove Road and Golfview Terrace, in Buffalo Grove.
- b) Retrofit fall protection shall be manufactured by USF.
- c) Grates shall be aluminum with powder-coated safety orange finish, 316 Stainless steel hardware and hold-open device, and staple for a padlock.
- d) Protection shall be pedestrian rated at 300 psf.
- e) Protection shall be retrofit into existing USF Hatch THD 44 x 72 Alum with a debris free frame, enclosed vertical springs, slamlock, oversized recessed padlock, with a 44 x 72 frame opening and 36 x 64 clear opening.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with the construction documents, shop drawings, and manufacturer’s installation instructions.

PART 4 – MEASUREMENT AND PAYMENT

4.01 CHATHAM LIFT STATION

Work specified in this Section for the Chatham Lift Station will not be measured or paid for as a separate item. Access hatch for the wet well shall be included in SUBMERSIBLE SOLIDS HANDLING PUMPS AND APPURTENANCES as described in Section 22 13 29. Access hatches for the valve vault, including the bypass coupling connection and access hatch, shall be included in METER / VALVE / BYPASS VAULT as described in Section 03 00 00.

4.01 GOLFVIEW LIFT STATION

A. Measurement

1. Measurement will not be made for Work specified in this Section.

B. Payment

1. Payment for the Work specified in this Section will be made at the lump sum price for GOLFVIEW LIFT STATION SAFETY GRATE RETROFIT.

--- END OF SECTION ---

**FORCE MAIN VIDEO INSPECTION
SECTION 22 01 10**

PART 1 -- GENERAL

1.01 SCOPE

- A. It is the intent of this work to assess the service condition of the existing Chatham 14" force main during the construction of the Chatham Lift Station. Assessment will be performed using visual inspection and pan and tilt color camera-CCTV.
- B. Qualifications of contractor:
 - 1. If requested by the Engineer, the proposed contractor shall submit a verifiable reference list documenting the successful completion of a minimum of 500,000 linear feet of internal sewer condition assessment on projects of similar size and scope to this project.
- C. It is the responsibility of the Contractor to comply with applicable OSHA regulations. The Contractor shall provide upon request, written documentation that all workers have received the training required under these regulations and guidelines.
- D. Two forms of internal condition assessment are addressed by these specifications:
 - 1. Sewer survey – Detailed viewing of the sewer ("survey"), with the aid of CCTV equipment, to assess internal structural condition of the force main.
 - 2. Sewer inspection – Viewing the sewer system pursuant to investigative work following other operational activity including:
 - a. Sewer preconditioning and cleaning activities

1.02 SUBMITTALS

- A. As requested by the Engineer, the Contractor shall provide to the Engineer the following according to Section 01 33 00.
 - 1. Listing of Cleaning Equipment & Procedures
 - 2. Listing of Flow Diversion Procedures
 - 3. Listing of Preconditioning Procedures

4. Listing of Safety Precautions and Traffic Control Measures
5. Listing of CCTV Equipment
6. Listing of Backup and Standby Equipment (At Commencement)
7. Location where Debris from Cleaning will be Disposed
8. Two (2) Copies of CCTV DVD's, two (2) Copies of Inspection Report incorporating a summary statistical breakdown of defects and main findings.

1.03 REQUIREMENTS AND EXTENT OF SURVEY/INSPECTION

- A. The Contractor shall survey and/or inspect sewer systems with color pan and tilt CCTV imagery as specified in order to record all relevant features and confirm their structural and service condition. Surveys/Inspections of sewer systems shall be carried out in compliance with the NASSCO PACP reporting format and coding standards.
- B. All CCTV operator(s) responsible for direct reporting of sewer condition shall have a minimum of 3 years previous experience in surveying, processing, and interpretation of data associated with CCTV surveys/inspections.
- C. Approved Contractors will be required to provide evidence acceptable to the Engineer that all CCTV technicians performing work under this contract have satisfactorily completed NASSCO Pipeline Assessment Certification Program, (PACP) training and possess valid PACP Certification documents. All defect coding, as well as material, shape and lining coding used throughout the project will conform to NASSCO's Pipeline Assessment Certification Program, PACP. Required training to meet these requirements will be carried out at the Contractor's expense.

1.04 SURVEY/INSPECTION UNITS

- A. The Contractor shall provide sufficient survey/inspection units and all relevant ancillary equipment, including standby units in the event of breakdown, in order to complete all sewer and manhole surveys/inspections as specified.

1.05 CCTV SURVEY/INSPECTION AND OPERATIONAL EQUIPMENT REQUIREMENTS

- A. The surveying/inspecting equipment shall be capable of surveying/inspecting equipment shall be capable of surveying/inspecting a length of sewer up to at least 1000 ft. when entry onto the sewer may be

obtained at each end and up to 750 ft. where a self-propelled unit is used, where entry is possible at one end only. The Contractor shall maintain this equipment in full working order and shall satisfy the designated representative at the commencement of each working shift that all items of equipment have been provided and are in full working order.

- B. Each survey/inspection unit shall have on call equipment available to carry out the flushing, rodding and jetting of sewers as and when such procedures are deemed to be necessary.

1.06 RESPONSIBILITY FOR OVERFLOWS OR SPILLS

- A. It shall be the responsibility of the Contractor to schedule and perform his work in a manner that does not cause or contribute to incidence of overflows or spills of sewage from the sewer system.
- B. In the event that the Contractor work activities contribute to overflows or spills, the Contractor shall immediately take appropriate action to contain and stop the overflow, clean up the spillage, disinfect the area affected by the spill, and notify the designated representative in a timely manner.
- C. Contractor will indemnify and hold harmless the Owner for any fines or third- party claims for personal or property damage arising out of a spill or overflow that is fully or partially the responsibility of the Contractor, including the legal, engineering and administrative expenses of the Owner in defending such fines and claims.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 CLEANING PRIOR TO INTERNAL CONDITION INSPECTION

- A. The Contractor shall clean the sewer prior to internal condition inspection.

3.02 SEWER CLEANING UNITS AND EQUIPMENT

- A. The Contractor shall provide sufficient sewer cleaning units and equipment, including standby units in the event of breakdown, in order to complete cleaning operations as specified.

3.03 REMOVAL OF DEBRIS WITH CLEANING

- A. The Contractor shall provide all equipment and personnel necessary to safely remove and extract silt and debris from the sewer through existing manhole access, load it onto trucks for disposal, and dispose of the silt and debris at approved sites.

3.04 CCTV – GENERAL

- A. CCTV Camera Prime Position: The CCTV camera shall be positioned to reduce the risk of picture distortion. In circular sewers the CCTV camera lens head shall be positioned centrally (i.e. in prime position) within the sewer. In non-circular sewers, picture orientation shall be taken at mid-height, unless otherwise agreed, and centered horizontally. In all instances the camera lens head shall be positioned looking along the axis of the sewer when in prime position. A positioning tolerance of $\pm 10\%$ of the vertical sewer dimension shall be allowed when the camera is in prime position.
- B. CCTV Camera Speed: The speed of the CCTV camera in the sewer shall be limited to 30 LF per minute for surveys to enable all details to be extracted from the ultimate CD-ROM recording. Similar or slightly higher speed as agreed by the designated Engineer shall be provided for inspections.
- C. CCTV Color Camera: The Contractor shall provide a color pan and tilt camera(s) to facilitate the survey and inspection of all laterals, including defects such as hydrogen sulfide corrosion in the soffit of sewers and benching or walls of manholes over and above the standard defects that require reporting, where required by the designated Engineer. These will be carried out as part of the normal CCTV assessment as the survey or inspection proceeds when instructed by the designated representative.
- D. Linear Measurement:
 - 1. The CCTV monitor display shall incorporate an automatically updated record in feet and tenths of a foot of the footage of the camera or center point of the transducer, whichever unit is being metered, from the cable calibration point. The relative positions of the two center points should also be noted.
 - 2. The Contractor shall use a suitable metering device, which enables the cable length to be accurately measured; this shall be accurate to $\pm 1\%$ or 3 inches whichever is the greater.
 - 3. The Contractor shall demonstrate compliance with the tolerance listed above, using one or both of the following methods in conjunction with a linear measurement audit form which shall be completed each day during the survey:
 - a. Use of a cable calibration device
 - b. Tape measurement of the surface between manholes

4. A quality control form will be completed and submitted by the contractor depicting the level of accuracy achieved.
5. If the Contractor fails to meet the required standard of accuracy, the designated representative shall instruct the Contractor to provide a new device to measure the footage. The designated Engineer retains the right to instruct the Contractor in writing, to re-survey those lengths of sewer first inspected with the original measuring device using the new measuring device.

E. Data Display, Recording and Start of Survey/Inspection:

1. At the start of each sewer length being surveyed or inspected and each reverse set-up, the length of pipeline from zero footage, the entrance to the pipe, up to the cable calibration point shall be recorded and reported in order to obtain a full record of the sewer length. Only one survey shall be indicated in the final report. All reverse set-ups, blind manholes, and buried manholes shall be logged on a separate log. Video digits shall be recorded so that every recorded feature has a correct tape elapsed time stamp. Each log shall make reference to a start and finish manhole unless abandonment took place because of blockage. Manhole number shall be indicated in the remark's column of the detail report. Surveys must not extend over 2 tapes.
2. The footage reading entered on to the data display at the cable calibration point must allow for the distance from the start of the survey/inspection to the cable calibration point such that the footage at the start of the survey is zero.
3. In the case of surveying through a manhole where a new header sheet must be completed, the footage shall be set at zero with the camera focused on the outgoing pipe entrance.
4. At the start of each manhole length a data generator shall electronically generate and clearly display on the viewing monitor and subsequently on the CD-ROM recording a record of data in alpha- numeric form containing all fields required by the PACP information standard:
5. The size and position of the data display shall be such as not to interfere with the main subject of the picture.
6. Once the survey of the pipeline is under way, the following minimum Information shall be continually displayed:

- a. Automatic update of the camera's footage position in the sewer line from adjusted zero
 - b. Sewer dimensions in inches
 - c. Manhole or pipe length reference number (PLR). General convention allows upstream manhole number to be designated PLR.
 - d. Direction of survey, i.e., downstream or upstream
7. Correct adjustment of the recording apparatus and monitor shall be demonstrated by use of the test tape or other device approved by the Contractor. Satisfactory performance of the camera shall be demonstrated by the recording of the appropriate test device at the commencement of each day for a minimum period of 30 seconds.
 8. Footage and corresponding time elapsed video digit shall be given throughout survey/inspection for all relevant defects and construction features encountered unless otherwise agreed.
 9. Where silt encountered is greater than 10 percent of the diameter of the pipe, the depth of silt shall be recorded at approximately 50-foot intervals.
 10. CD-ROM capacity shall be adequate to record two hours of video inspection. Recording of a single segment shall not extend over more than one video tape. No unrecorded gaps shall be left in the recording of a segment between surveys/inspections.
 11. Only segments between manholes on the same sewer reach or basin shall be included on one CD-ROM. There shall be no "split surveys" or "split basins" between CD-ROMs.
 12. All continuous defects shall incorporate a start and finish abbreviation in the log report
- F. Coding: Defect Coding, as well as Material, Shape, and Lining Coding, and conventions used throughout the project will be PACP-compliant. The CCTV Contractor must ensure that all surveyors conform to the detailed requirements of the reporting procedure concerning feature description and feature definition as well as the computer file format.

3.10 COLLAPSED SEWERS/DEFECTIVE MANHOLES

- A. Any sewer found with greater than 10% deformation (i.e. collapsed or near to collapse) must be reported to the designated representative immediately

for remedial action.

- B. Any manhole found broken, cracked, with missing covers or surcharged, must be reported to the designated representative immediately for remedial action
- C. Any sewer found with existing conditions that pose a threat of personal injury to the public, such as a collapsed sewer with attendant depression roadway, must be protected by the Contractor until the designated representative arrives at the job site
- D. Any manhole found where the existing conditions pose a threat of personal injury to the public, such as broken, cracked or missing covers or covers found in traveled portions of any sidewalk or roadway must be protected by the Contractor until the designated representative arrives at the job site.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item.
Force main video inspection shall be included in DUCTILE IRON FORCE MAIN, 14”.

PROCESS PIPING AND APPURTENANCES
SECTION 22 13 19

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Provide and test process pipe, fittings, and appurtenances as indicated and specified, between the pumps and the force-main. The force-main shall be defined as buried main commencing after the meter / valve / bypass vault.

1.2 RELATED WORK:

- A. Section 33 05 19: Ductile-Iron Pipe and Fittings
- B. Section 22 13 29: Submersible Solids Handling Pumps and Appurtenances
- C. Section 22 10 00: Process Valves and Appurtenances

1.3 REFERENCES:

- A. American Welding Society: AWS B3.0
- B. Manufacturer's Standardization Society: MSS SP-69
- C. American Society for Testing and Materials:
 - 1. ASTM A216: Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service
 - 2. ASTM A307: Standard Specification for Carbon Steel Externally Threaded Standard Fasteners
 - 3. ASTM D1330: Standard Specification for Rubber-Sheet Gaskets
- D. American National Standards Institute:
 - 1. ANSI B16.1: AN Standard for Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250 and 800
- E. Fluid Sealing Association - Technical Handbook.

1.4 SUBMITTALS:

- A. Submit the following in accordance with Section 01 33 00:

1. Submit manufacturer's certificates of conformance.
2. Submit certified copies of test reports.
3. Piping layouts in full detail.
4. Location of pipe hangers and supports.
5. Location and type of backup block or device to prevent joint separation.
6. Large scale details of wall penetrations and fabricated fittings.
7. Schedules of all pipe, fittings, special castings, flexible connectors, adapters, couplings, expansion joints, and other appurtenances.
8. Reports as required for welding certifications per ANSI B31.1 Paragraph 127.6.
9. Catalog cuts of joints, couplings, harnesses, expansion joints, gaskets, fasteners and other accessories.
10. Brochures and technical data on coatings and linings and proposed method for application and repair.
11. Manufacturer's descriptive literature and technical data on insulation and proposed method of installation.
12. Shop drawing data for accessory items.
13. Manufacturer's literature as needed to supplement certified data.
14. Operating and maintenance instructions and parts lists.
15. Schematic control and power wiring diagrams.
16. Shop and Field inspections reports.
17. List of recommended spare parts other than those specified.
18. Recommendations for short and long term storage.
19. Special tools.
20. Shop and field testing procedures and equipment to be used.
21. Provide a listing of the materials recommended for each service specified and indicated. Provide documentation showing compatibility

with process fluid and service specified and as indicated.

22. The most recent ISO 9000 series certification or quality system plan.

23. Material Certification:

- a. Provide certification from the equipment manufacturer that the materials of construction specified are recommended and suitable for the service conditions specified and as indicated. If materials other than those specified are proposed based on incompatibility with the service conditions, provide technical data and certification that the proposed materials are recommended and suitable for the service conditions specified. And indicated including an installation list of a minimum of five (5) installations in operation for a minimum of five (5) years. Provide proposed materials at no additional cost to the Authority.
- b. Where materials are not specified, provide technical data and certification that the proposed materials are recommended and suitable for the service conditions specified and indicated.

B. A copy of the contract mechanical process, electrical and instrumentation drawings, with addenda that are applicable to the equipment specified in this section, marked to show all changes necessary for the equipment proposed for this specification section. If no changes are required, mark all drawings with "No changes required".

1. Failure to include all drawings applicable to the equipment specified in this section will result in submittal return without review.

C. A copy of this specification section with addenda and all referenced specification sections with addenda, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations and clarifications from the specified requirements.

1. If deviations and clarifications from the specifications are indicated, therefore requested by the Contractor, provide a detailed written justification for each deviation and clarification.

2. Failure to include a copy of the marked-up specification sections and or the detailed justifications for any requested deviation or clarification will result in submittal return without review until marked up specification and justification are resubmitted with the entire package.

1.5 QUALITY ASSURANCE:

A. Provide in accordance with Section 01 43 00 and as specified.

- B. Replace all materials contaminated with gasoline, lubricating oil, liquid or gaseous fuel, aromatic compounds, paint solvent, paint thinner, and acid solder at no additional cost to the Owner.
- C. Coordinate dimensions and drilling of flanges with flanges for valves, pumps and other equipment to be installed in piping systems. Bolt holes in flanges to straddle vertical centerline.
- D. Qualification for Pipe Support Structural Attachment Welders: Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests. If recertification of welders is required, retesting is the Contractor's responsibility at no additional cost to the Owner.
- E. Protect piping from dirt, dust, oil, grease, and other foreign matter during installation to prevent debris from being left in piping.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Provide in accordance with Section 01 60 00 and as specified.
- B. Shipping:
 - 1. Ship equipment, material and spare parts complete except where partial disassembly is required by transportation regulations or for protection of components.
 - 2. Pack spare parts in containers bearing labels clearly designating contents and pieces of equipment for which intended.
 - 3. The Contractor shall obtain spare parts from the manufacturer at the same time as pertaining equipment. The Contractor shall maintain possession of spare parts until Substantial Completion at which time, all spare parts shall be turned over to the Owner.
- C. Receiving:
 - 1. Inspect and inventory items upon delivery to site.
 - 2. Store and safeguard equipment, material and spare parts in accordance with manufacturer's written recommendations and instructions.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS:

A. Provide in accordance with Section 33 05 19.

2.2 PRESSURE AND FLOW INSTRUMENTATION:

A. Provide in accordance with Section 33 09 30.

2.3 BYPASS COUPLING SYSTEM:

A. Acceptable Manufacturers

1. Precision Systems without exception.

B. Description

1. Bypass coupling connection and hatch shall include a 6" Camlock fitting manufactured for an NPT connection to valve vault riser pipe. Camlock fitting shall be integral to a rectangular stainless steel and aluminum assembly for casting in valve vault lid. Hatch shall be aluminum checkplate, with lockable lid and waterproof lock.

2.4 PIPE SUPPORTS:

A. Saddle Stands: Used adjustable saddle stands.

1. Provide each stand with a length of steel pipe fitted at the base with standard threaded cast-iron flange or steel base plat and at the top with an adjustable saddle or roll. Bolt the base flange or plate to the floor, foundation or concrete base.

2. Use stanchions of construction similar to the saddle stand, except fit them at the top with cast-iron pipe saddle supports or with pipe stanchion saddles with yokes and nuts.

2.5 COUPLINGS-SLEEVE TYPE:

B. Manufacturers:

1. Romac

2. Smith Blair

3. Viking Johnson

4. Dresser

5. Or acceptable equivalent product.
- C. Provide couplings meeting AWWA C219
- D. Couplings 12-in and smaller:
1. End rings and center rings: ASTM A536 ductile iron, fusion bonded epoxy coated
 2. Gaskets: Buna-N, NSF 61 approved
 3. Hardware: Type 316 stainless steel
- E. Bridles and tierods: Minimum $\frac{3}{4}$ -in diameter, except where tierods replace flange bolts of smaller size, in which case fit with nut on each side of pair of flanges.
1. Provide as indicated

2.6 EXPANSION JOINTS-STAINLESS STEEL:

- A. Manufacturers:
1. Pathway
 2. Flexonic
 3. Adsco
 4. Or acceptable equivalent product.
- B. Design Criteria:
1. Liquid: Service as indicated in the Process Pump Schedule.
 2. Liquid Temperature: As indicated in the Process Pump Schedule.
 3. Minimum Pressure Rating: 150 psi minimum or as indicated in the Process Piping Schedule.
 4. Minimum Lateral Movement: 0.125-inch.
 5. Minimum Axial Movement: 0.4-inch
 6. For expansion joints used on pump discharge nozzles the Contractor shall coordinate the rod size and movement allowable with the pump manufacturer and provide a statement from the pump manufacturer that

the expansion joint and rod size is acceptable for the pump provided.

C. Products:

1. Provide bellows of two ply construction formed from concentric tubes having only longitudinal seams.
2. For two ply construction, each ply shall be capable of retaining the rated pressure at the specified temperature independently.
3. For two ply construction, seal weld both plies so that no gas or liquid leaks out at the ends.
4. For two-ply construction, provide a pressure monitoring connection with pressure gauge and pressure switch as specified herein for the annular space.
5. Provide control rods for test pressure.
6. Provide minimum two lifting lugs on each joint. Each lug shall be designed to carry the entire weight of the assembly.
7. Provide each joint with a liner and mark a flow arrow on the outside to indicate direction of flow.
8. Provide each expansion joint with a Type 316 stainless steel nameplate indicating size, bellows material, pressure and temperature rating, lateral and axial limits on movement, date of manufacturer, and the manufacturer.

D. Materials:

1. Bellows:
 - a. Inner Ply: Inconel alloy 625, minimum 0.048-inch thick.
 - b. Outer Ply: Inconel alloy 625, minimum 0.048-inch thick.
2. Liner: Type 316L stainless steel, minimum 0.1875-inch thick.
3. Flanges: Type 316L stainless steel, Class 150.
4. Limit Rods/Nuts and Hardware: Type 316 stainless steel.

E. Install joints in their neutral position.

2.7 WALL SLEEVES:

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A. Materials:

1. Wall Sleeves Between Dry Area or Between Dry Area and Ground
 - a. Flexible boots meeting ASTM C923 Clamp-On Type or “A-Lock” Type.
 - b. Clamp to pipe using minimum of 2 stainless steel clamps.

B. Hardware: Type 316 stainless steel.

PART 3 – EXECUTION

3.1 INSTALLATION:

- A. Install items in accordance with manufacturer's printed instructions and as indicated and specified.
- B. Ensure interior lines parallel to building walls wherever possible. Install piping to accurate lines and grades, and support. Provide pipe supports as specified under Part 2.3 of this section. Where temporary supports are used, ensure rigidity, to prevent shifting or distortion of pipe. Provide for expansion.
- C. Before assembly, remove all dirt and chips from inside pipe and fittings.
- D. Use dielectric bushings or unions when ferrous pipes join nonferrous pipes carrying liquid either underground or elsewhere.
- E. Welding in accordance with AN Standard B31 and AWS B3.0.

3.2 WALL SLEEVE SEALS:

- A. Pack annular spaces with extrudible preformed plastic gasket material to prevent debris from entering space between pipe and flexible boot..

3.3 TEMPORARY PLUGS:

- A. Close open ends of pipe with temporary plugs or caps when pipe installation is not in progress. Use watertight plugs for exterior, buried piping and if water or debris is in trench when work is resumed, do not remove until adequate provision has been made to prevent any water or debris entering pipe even if it necessitates dewatering trench.

3.4 TESTING:

- A. Process piping shall undergo pressure and leakage testing in accordance with

Part 3.5 of Section 33 05 19.

3.5 TOUCH-UP FIELD PAINTING:

- A. Repair or replace damaged or defective coating areas.
- B. Remove damaged or defective coatings by sand-blast cleaning in accordance with SSPC-SP-6, Commercial Grade, immediately prior to priming.
- C. Before priming, provide surfaces dry and free of dust, oil, grease and other foreign material.
- D. Apply approved coating in accordance with valve manufacturer's printed recommendations.
- E. When small areas of coating need touch up, surface preparation may be done with suitable power needle gun to match specified blast cleaning.

3.6 CONTRACT CLOSEOUT:

- A. Provide in accordance with Section 01 77 00.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for PROCESS PIPING AND APPURTENANCES.
 - 1. Price shall exclude the flow meter, which is included in the cost of WASTEWATER PUMPING CONTROL SYSTEM COMPLETE per Section 33 09 30.

--- END OF SECTION ---

PROCESS VALVES AND APPURTENANCES
SECTION 22 10 00

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Provide and test valves and appurtenances as indicated and specified.
 - 1. Provide sizes and capacities as indicated or specified.

1.2 RELATED WORK:

- A. Section 22 13 19: Process Piping and Appurtenances
- B. Section 33 05 19: Ductile Iron Pipe and Fittings

1.3 REFERENCES:

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A48: Specification for Gray Iron Castings.
 - 2. ASTM A126: Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
 - 3. ASTM A536: Specification for Ductile-Iron Castings.
- B. American National Standards Institute (ANSI):
 - 1. ANSI B2.4: Hose Coupling Screw Threads.
 - 2. ANSI B16.1: Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
 - 3. ANSI B16.4: Cast-Iron Threaded Fittings, Class 125 and 250.
 - 4. ANSI B16.10: Face-to-Face and End-to-End Dimensions of Ferrous Valves.

1.4 SUBMITTALS:

- A. Shop Drawings: Submit the following in accordance with Section 01 33 00 - SUBMITTALS:
 - 1. Certified shop and erection drawings.

- a. Electronic files shall conform to the following minimum requirements:
 - (1) Electronic Files: AutoCad R2010 or higher, drawn to scale.
 - (2) Submit electronic files as part of the Shop Drawing submittal.
 - (3) Submit electronic files on CD or DVD
 - (4) Drawings shall include plan views, sectional views, title block, Tag Numbers, serial numbers, Parts List (identifying each component), dimensions, connection sizes and types and all details of all related items. In cases where certain information is proprietary and is omitted, provided a statement indicating that the information is proprietary and is being omitted.
 - b. Drawings shall be in conformance with all other requirements as specified in this specification.
2. Data, regarding valve characteristics and performance.
 3. Shop drawing data for accessory items.
 4. Manufacturer's literature as needed to supplement certified data.
 5. Operating and maintenance instructions and parts lists.
 6. Listing of reference installations as specified with contact names and telephone numbers.
 7. Valve shop test results.
 8. Qualifications of field service technician.
 9. Shop and Field inspections reports.
 10. List of recommended spare parts other than those specified.
 11. Recommendations for short and long term storage.
 12. Special tools.
 13. Shop and field testing procedures and equipment to be used.
 14. Number of service technician days provided and per diem field service rate.

15. Manufacturer's product data and specifications for shop painting.
 16. Provide layout drawing showing orientation of plug, gate, check and ball valves and actuator and nearest obstruction.
 17. Manufacturer's product data and specifications for shop painting.
 18. Provide a listing of the materials recommended for each service specified and indicated. Provide documentation showing compatibility with process fluid and service specified and indicated.
 19. The most recent ISO 9000 series certification or quality system plan.
 20. Material Certification:
 - a. Provide certification from the equipment manufacturer that the materials of construction specified are recommended and suitable for the service conditions specified and indicated. If materials other than those specified are proposed based on incompatibility with the service conditions, provide technical data and certification that the proposed materials are recommended and suitable for the service conditions specified and indicated including an installation list of a minimum of five (5) installations in operation for a minimum of five (5) years. Provide proposed materials at no additional cost to the Owner.
 - b. Where materials are not specified, provide technical data and certification that the proposed materials are recommended and suitable for the service conditions specified and indicated.
- B. A copy of this specification section with addenda and all referenced specification sections with addenda, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations and clarifications from the specified requirements.
1. If deviations and clarifications from the specifications are indicated, therefore requested by the Contractor, provide a detailed written justification for each deviation and clarification.
 2. Failure to include a copy of the marked-up specification sections and or the detailed justifications for any requested deviation or clarification will result in submittal return without review until marked up specification and justification are resubmitted with the entire package.

1.5 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01 43 00 and as specified herein.
- B. Provide enclosures for atmospheres specified and indicated.
- C. Contractor responsible for verifying outside diameter of pipe to be tapped.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Provide in accordance with Section 01 60 00 and as specified herein.
- B. Shipping:
 - 1. Ship equipment, material and spare parts complete except where partial disassembly is required by transportation regulations or for protection of components.
 - 2. Pack spare parts in containers bearing labels clearly designating contents and pieces of equipment for which intended.
 - 3. The Contractor shall obtain spare parts from the manufacturer at the same time as pertaining equipment. The Contractor shall maintain possession of spare parts until Substantial Completion, at which time all spare parts shall be turned over to the Owner.
- C. Receiving:
 - 1. Inspect and inventory items upon delivery to site.
 - 2. Store and safeguard equipment, material and spare parts in accordance with manufacturers written instructions.

PART 2 - PRODUCTS

2.1 ECCENTRIC PLUG VALVES:

- D. Manufacturers:
 - 1. Mueller
 - 2. DeZurik.
 - 3. Or approved equal.
- E. Type: Non-lubricated, eccentric.

F. Body Working Pressure:

1. Cast Iron, ASTM A126 Class B or Ductile Iron, ASTM A536, Grade 64-45-12.
 - a. Valves 4-in. through 12-in: 175 psi.

G. Ends:

1. Grooved: ANSI/AWWA C606 for ductile iron valves.
2. Flanged: ANSI B16.1 125-lb for cast iron valves.
3. Flanged: B16.5 150-lb for carbon steel and stainless steel valves.
4. Buried Valves: Mechanical joint.

H. Valve Ports:

1. Provide rectangular or circular except for pigging services.
2. Valves 20-in and smaller: Not less than 80 percent of pipe area.

F. Valve Seats:

1. Coat plug with seat material or hold by means of Type 316 stainless steel seat ring and attach to the valve with self-locking Type 316 stainless steel screws.
 - a. Seat Material:
 - (1) Neoprene or Buna-N synthetic rubber.
2. Provide valves with coated plugs with mating seats of 90 percent, minimum, pure nickel welded into the body of valves.
3. Provide valves with seats clamped to valve with mating seat of 90 percent, minimum, pure nickel welded to the valve body.

G. Upper and Lower Plug Journal Bearings:

1. Removable, permanently lubricated stainless steel bushings for valves 20-in and smaller.
2. Provide grit seals for upper and lower plug shafts for all valves.

H. Stem Seals:

1. Adjustable multiple V-packing or multiple point contact rubber rings.
 2. Replaceable without valve disassembly.
 3. Provide valves with two sets of packing rated for vacuum service for all pump suction isolation service and for services where a vacuum is specified and indicated.
- I. Operators for Valves 4-in and larger:
1. Manual Operators:
 - a. Gear shall be operated with handwheels. Levers are not acceptable.
 - b. Operators shall be mounted as shown on the plans.
 - c. Provide gear operators rated for bi-directional shutoff at the valve working pressure rating as specified herein.
 - d. Gear operators: Totally enclosed worm gear, traveling nut type is not acceptable. Provide permanently lubrication, watertight and dustproof, with adjustable open and closed stops and plug position indicator.
 - e. Provide all work gears designed and certified to withstand input loads up to 300-ft-lbs minimum at the stops without damage.
 - f. Buried or submerged valves: Provide watertight gear operator with handwheel operated floorstand as indicated. Gear operator to be totally enclosed and gasketed with Type 316 stainless steel hardware.
 - g. Chainwheels: Provide where required as specified herein.
 - h. Where indicated provide Type 316 stainless steel stem extension to operating floor elevation as indicated and provide the bevel gear operator with a fabricated steel floorstand and handwheel.
- J. Shop Testing:
1. Provide all plug valves tested and certified bubble tight in both directions at the full rated working pressure as specified herein.
- K. Shop Painting:
1. Provide fusion bonded epoxy, 12 mils inside and out.

2. For valves installed in glass lined and ceramic epoxy lined piping systems, provide glass lined valves with epoxy paint coating as specified herein.

2.2 RUBBER FLAPPER CHECK VALVES:

A. Manufacturers:

1. Mueller
2. DeZurik
3. APCO
4. Val-Matic
5. Or approved equal.

B. Materials:

1. Body and Cover: Ductile Iron ASTM A536 Grade 65-42-12
2. Removable Body Seat: ASTM A276, Type 304 stainless steel
3. Rubber Flapper: Buna N 70 Durometer ASTM 2000-BG encapsulating an ASTM A36 steel plate.
4. Hinge Pin: AISI 1018
5. Disc arm and external levers shall be ductile iron.

C. Provide valves with a full pipe size flow area.

D. Provide valves 4-in and larger capable of passing a 3 inch sphere.

E. Provide a threaded connection with bronze plug on cover and on the bottom of the valve

F. Working Pressure:

1. 2-in thru 24-in: 250 psi

G. Ends: Flanged ANSI B16.1, 150-lb

H. Provide seating surface at a 45 degree angle such that the flapper travels a maximum of 35 degrees from full closed to full open position.

- I. Provide valve with cover designed for removal of the valve internals without removing the valve from the pipeline.
- J. Lever and weight: Valve shall include a lever and weight assembly. The lever shall be equipped with three holes for adjusting the bolted weight assembly. When the valve is closed, the lever and weight shall be located 30 degrees below horizontal. Lever and weight shall be mounted on the side of the valve and in the direction as shown on the plans.
- K. Position Indicator:
 - 1. Provide a mechanical indicator to provide disc position for valves 4-in and larger.
 - 2. Provide the indication with continuous contact with the disc
- L. Limit Switch: A pre-wired limit switch shall be provided to indicate open/closed position to a remote location. The mechanical type limit switch shall be activated by the external arm and rated for NEMA 4 and shall have U.L. rated 5 amp, 125 VAC contacts.

2.3 BALL VALVES – GENERAL SERVICE:

- A. Manufacturers:
 - 1. Jamesbury
 - 2. KF
 - 3. Inline
 - 4. Kitz
 - 5. Or acceptable equivalent product.
- B. Valves ½-in thru 4-in
 - 1. Materials:
 - a. Body and End Cap: Three piece, ASTM A351 Grade CF8M.
 - b. Body Seal: PTFE.
 - c. Seat: RTFE.
 - d. Ball: Type 316 stainless steel.

- e. Stem: Type 316 stainless steel.
- 2. Pressure Rating:
 - a. ½-in thru 2-in: 1000 psi at 100 deg F
- 3. Ends:
 - a. 2-in and Smaller: Screwed or flanged.

C. Actuators:

- 1. Manual: Provide lever operator

2.4 PAINTING:

- A. Coat internal and external ferrous surfaces of valve with NSF Certified Epoxy in accordance with ANSI/NSF Std. 61, and in conformance to AWWA D102 Inside System No. 1 for all valves not specified to have a fusion bonded epoxy coating.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Prior to installation, protect stored valves and appurtenances from damage due to exposure to sunlight, heat, dirt, debris, freezing and thawing, vandalism, etc.
- B. Clean all debris, dirt, gravel, etc, from inside of piping before placing valves in place.
- C. Erect and support valves in respective positions free from distortion and strain on appurtenances during handling and installation. Inspect material for defects in workmanship and material. Clean out debris and foreign material from valve openings and seats, test operating mechanisms to check functioning, and check nuts and bolts for tightness. Repair, valves and other equipment which do not operate easily or are otherwise defective at no additional cost to the Owner.
- D. Set plumb and support valves in conformance with instructions of manufacturer. Shim valves mounted on face of concrete vertically and grout in place. Install valves in control piping for access.
- E. Provide bolted split sleeve coupling or flexible type grooved coupling on downstream side of buried valves to assist in valve removal.

- F. Where indicated provide Type 316 stainless steel stem extension to operating floor elevation as indicated and provide the bevel gear operator with a fabricated steel floorstand and handwheel.

3.2 GATE VALVES:

- A. Install gate valve stem as indicated or with stems between vertical and 45 degrees above the horizontal. Valves installed with stems below horizontal are not acceptable.

3.3 CHECK VALVES:

- A. Install swing check valves horizontally in pipelines.

3.4 PLUG VALVES:

- A. Install valves in horizontal piping with shaft horizontal such that in open position, plug is located in upper part of valve body. Orient valves so that in closed position, flow is against the face of the plug.

3.5 VALVE BOXES:

- A. Provide valve box for each buried valve and where indicated.
- B. Set box so top is flush with finished surface and so box does not bear on valve, or pipe.

3.6 TOUCH-UP FIELD PAINTING:

- A. Repair or replace damaged or defective coating areas.
- B. Remove damaged or defective coatings by sand-blast cleaning in accordance with SSPC-SP-6, Commercial Grade, immediately prior to priming.
- C. Before priming, provide surfaces dry and free of dust, oil, grease and other foreign material.
- D. Apply approved coating in accordance with valve manufacturer's printed recommendations.
- E. When small areas of coating need touch up, surface preparation may be done with suitable power needle gun to match specified blast cleaning.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will not be made for the Work specified in this Section.

4.2 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum price for PROCESS VALVES AND APPURTENANCES.

--- END OF SECTION ---

**SUBMERSIBLE SOLIDS HANDLING PUMPS AND APPURTENANCES
SECTION 22 13 29**

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Submersible centrifugal non-clog pumps and motor units with necessary lifting accessories.

B. Access frame and hatch.

1.2 ACTION SUBMITTALS

A. Certification of Coordination:

1. A certification shall be provided that the pumps will fit through the submitted access hatch clear opening; the new precast flat top slab has been structurally designed to allow for the periodic removal of the pumps; should the pumps not fit through the installed access hatch, a new hatch and flat top slab assembly will be re-designed, supplied, and installed at no additional cost to the Village of Buffalo Grove.

B. Product Data:

1. Manufacturer's literature, illustrations, specifications, engineering data, fabrication, assembly, installation and wiring diagrams.

2. Manufacturer's warranty.

C. Shop Drawings: Show arrangement, dimensions, and materials.

D. Test and evaluation reports:

1. Characteristic performance curves for pumps, showing total dynamic head, efficiency, and brake horsepower plotted against capacity in gpm (lpm) for conditions of head and capacity with required impeller.

2. Motor test data and shop test results.

3. Certified shop test curves.

E. Submit copy of this Section with addenda and referenced sections with addenda, with each paragraph check-marked to indicate specification

compliance or marked to indicate requested deviations and clarifications from specified requirements.

1. If deviations and clarifications from Specifications are indicated and requested by Contractor, provide detailed written justification for each deviation and clarification.
2. Failure to include copy of marked-up specification sections and or detailed justifications for requested deviation or clarification will result in rejection of submittal with no further review and consideration.

1.3 CLOSEOUT SUBMITTALS

A. Operation and maintenance manuals:

1. Operation manuals:
 - a. Detail step-by-step procedures required for system startup, operation, and shutdown.
 - b. Include manufacturer's name, model number, parts list, and brief description of equipment and basic operating features.
2. Maintenance manuals:
 - a. List routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides.
 - b. Include piping and equipment layout and simplified wiring and control diagrams of system as installed.
3. Comply with requirements of Section 01 77 00.

1.4 QUALITY ASSURANCE

A. Manufacturer's qualifications:

1. Pumps shall be product of single manufacturer.
2. Manufacturer shall have 5 years' experience producing substantially similar equipment and evidence of at least 5 installations in satisfactory operation for at least 5 years.

B. Regulatory requirements: Comply with applicable provisions and recommendations of HI, NFPA 70 including Village of Buffalo Grove

amendments, IEEE, ANSI, NEMA except as otherwise shown or specified.

1.5 MAINTENANCE MATERIALS

A. Spare parts:

1. Each pump shall be furnished with a manufacturers repair kit that shall include as a minimum, one set of mechanical seals for each pump.
2. Pack spare parts in sturdy containers with clear indelible identification markings.
3. Store in a dry, warm location until transferred to Owner at conclusion of Project.
4. Comply with requirements of Section 01 77 00.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Model XFP 155J-CB2 as manufactured by Sulzer ABS.
- B. Or approved equal.

2.2 SYSTEM REQUIREMENTS

- A. Pumping units shall consist of submersible pumps and motors, guide rails, lifting chains, discharge elbow and mounting plate, anchor bolts, access frame and cover, electric cables, controls, and accessories for a complete, operable system suitable for installation in Class 1, Division 1 Group D conditions.
- B. Pumps shall be suitable for pumping municipal wastewater and shall be capable of passing 3" (75 mm) spheres without clogging.
- C. Pumps shall be suitable for continuous operation at flow conditions stated herein without excessive noise, vibration, heating, cavitation, or damage to pump.
- D. Head characteristics for pumps:
 1. Each pump shall be capable of delivering the following performance

points:

Point	U.S. GPM	TDH
1	425	56
2	1310	35
3	1965	22

2. Continuously rising as flow is decreased.
 3. Shutoff head shall be minimum of 1.2 times rated head.
- E. Size pumps to allow increase in rated pump head by as much as 10% by replacement of impellers.
- F. Fit each pump with centered lifting loop and Type 316 stainless steel lifting chain of adequate strength to raise and lower pumping unit. Chain shall be of length required for installation depth shown on Drawings.
- G. Discharge connections shall be permanently installed in wet well with discharge piping. Pump shall automatically connect to discharge connection elbow when lowered into place and shall disengage easily and automatically without removal of fasteners or piping when pump is raised.
- H. Attach sliding guide bracket to pump units which will slide between a minimum of 2 guide rails to properly position pump discharge on discharge connection elbow.
- I. Pump, appurtenances, and cable shall be capable of continuous submergence underwater to depth of 40' (12 m)* without loss of watertight integrity.
- J. Design pump motors to operate continuously at design conditions with 50% of motor unsubmerged without overheating.
- K. Pump shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in waste water.

2.3 PUMP DESIGN AND CONSTRUCTION

- A. Type: Submersible, nonclog, sewage handling, bottom suction, single vane impeller, integral discharge mating with discharge connection elbow, rail guided.
- B. Quantity: See Pump Schedule.
- C. Operating conditions: See Pump Schedule.
- D. Materials:
 - 1. Casing: Cast iron, ASTM A48.
 - 2. Impeller: Cast iron, ASTM A48.
 - 3. Shaft: Type 420 stainless steel.
 - 4. Exposed nuts and bolts: Type 316 stainless steel.
 - 5. Wear ring contact surface: Stainless steel.
 - 6. Anchor bolts: Type 316 stainless steel.
- E. Casing:
 - 1. Volute: Single-piece design with smooth fluid passages.
 - 2. Pump casing shall be of sufficient thickness to withstand a minimum hydrostatic test pressure of 150 psig (1,030 kPa).
 - 3. Provide with replaceable wearing ring.
 - 4. Mating surfaces requiring watertight sealing shall be machined and fitted with nitrile rubber O- rings. Sealing shall be accomplished by metal-to-metal contact and controlled compression of O- ring without specific torque requirement.
 - 5. Cable entry design:
 - a. Ensure a watertight and submersible seal without specific torque requirement.
 - b. Provide close tolerance fit against cable outside diameter and cable entry inside diameter and shall produce compression seal when installed.

- c. Entry body shall provide strain relief separate from sealing function to prevent strain in cable from damaging seal and allowing entry of water.
- d. Cable entry junction chamber and motor shall be separated by stator lead sealing gland or terminal board which shall prevent foreign material from coming in contact with motor interior.
- e. Junction chamber, containing terminal board with permanently affixed connectors between cable conductors and stator leads, shall provide completely leakproof seal from motor.

F. Impeller:

- 1. One-piece, semi-open, single vane, nonclog-type capable of handling solids normally present in sewage.
- 2. Manufactured from gray cast iron, Class 35B.
- 3. Capable of passing minimum of 3.94" solid.
- 4. Statically and dynamically balanced, securely positioned and locked to shaft using key and cap screw. Provide means for impeller clearance adjustment.
- 5. Impellers shall have smooth contours.

G. Shaft:

- 1. Machine and polish over entire length.
- 2. Dynamically balanced with impeller at all operating speeds.
- 3. Shaft shall provide rigid support of impeller and prevent critical vibration at all operating speeds.

H. Bearings:

- 1. Anti-friction ball and/or roller bearings, ABMA L10 life rating of 100,000 hours, designed to carry thrust and radial loads.
- 2. Lubrication: Permanently lubricated with grease or oil specifically suited for high temperature applications.

I. Thermal protection:

1. Provide thermal sensors to monitor stator temperatures. Three thermal switches, 1 in each stator phase, shall be embedded in end coils.
 2. Provide 1 thermal sensor to monitor lower bearing temperatures.
- J. Moisture protection: Provide 1 float-actuated reed switch in motor housing to detect liquid leakage into stator area.
- K. Seals:
1. Provide pump with shaft sealing system utilizing oil chamber.
 - a. Oil chamber shall provide means to compensate for changes in oil pressure.
 - b. Provide oil chamber with easily accessible drain and inspection plug equipped with positive, antileak seal. Access to plug shall not require any disassembly of pump.
 2. Dual independent mechanical rotating shaft seal system running in oil reservoir.
 - a. Lower seal unit, between pump and oil chamber: 1 stationary and 1 positively driven rotating tungsten carbide or carbon ceramic ring. Impeller pump-out vane shall be used in conjunction with carbon ceramic.
 - b. Upper seal unit, between oil chamber and motor housing: 1 stationary tungsten carbide or carbon ceramic ring and 1 positively driven rotating carbon ring.
 - c. Seal faces: Hold in contact by integral springs and hydrodynamically lubricate at constant rate.
 3. Seals shall require neither maintenance nor adjustment and shall be easily inspected and replaceable.
 4. Cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal.

2.4 ACCESS FRAME AND HATCH

- A. Provide double leaf corrosion resistant access frame and hatch for pumps per Section 08 10 10.

2.5 PRECAST CONCRETE FLAT TOP SLAB

- A. Pump installation shall be coordinated with the manufacture of the new wet well top slab as specified in Section 03 00 00.

2.6 GUIDE RAILS AND BRACKETS

- A. Guide rails: Minimum Schedule 40, Type 316 stainless steel pipe of sufficient size to remain rigid and unbending under intended loading conditions.
- B. Guide bars shall not support any portion of weight of pump.
- C. Secure lower end of guide bars to discharge connection. Secure upper ends to frame of access cover.
- D. Provide intermediate guide bar spacer supports when clear span distances between supports will exceed 12' (3.6 m).
- E. Sliding guide brackets: Cast iron or fabricated steel, galvanized after fabrication.

2.7 MOTORS

- A. Standards: Applicable parts of NEMA MG1.
- B. Type: Squirrel cage induction, shell-type design, housed in air-filled, watertight chamber. Oil-filled ball bearing motor acceptable alternate.
- C. Enclosure: Completely submersible, watertight.
- D. Ratings: Continuous duty 480-volt, 3-phase, 60 Hz, 1.3 service factor; capable of sustaining minimum of 15 evenly spaced starts per hour.
- E. Insulation and temperature rating: Class H insulation rated at 180°C (356°F).
- F. Starting: Full-voltage, across-the-line, for constant-speed pumps;.
- G. Nameplate horsepower shall be not less than maximum required pump input for all conditions of head and capacity for full range of impeller furnished, but shall not exceed 47 hp.
- H. Equip air-filled type motors with water jacket cooling system encircling

stator housing designed to circulate pumped liquid and sized to be nonclogging.

- I. Monitor stator temperature for pumps using thermal sensors embedded in each stator winding. Sensors shall be used in conjunction with and supplemental to external motor overload protection.
- J. Motors shall be furnished with preassembled power and control cables.

2.8 CONTROLS

- A. System controls shall conform to Section 33 09 30 – Wastewater Pumping Control System

2.9 SHOP FINISHING

- A. Sandblast submerged ferrous surfaces to SSPC SP10 finish and give one shop coat of Tnemec "46H- 413 Hi-Build Tneme-Tar," or equal coal tar epoxy, 8 mdft.
- B. Coat machine finished surfaces with suitable corrosion preventative compound.

2.10 IDENTIFICATION

- A. Permanently attach stainless steel nameplate to pump. Nameplate shall contain following information:
 - 1. Equipment number (see Drawings).
 - 2. Serial number of pump.
 - 3. Capacity in gpm.
 - 4. Pumping head in feet.
 - 5. Speed, rpm.
 - 6. Manufacturer's name.
 - 7. Size and type of pump.
 - 8. Motor horsepower.
 - 9. Design pressure and temperature.

- B. Each pump shall be provided with a cast-in or permanently attached direction-of-rotation arrow.

2.11 SOURCE QUALITY CONTROL

A. Hydraulic performance shop test:

1. Submersible pumps shall be factory-tested at pump manufacturer's plant. Tests shall be in accordance with Test Code of Hydraulic Institute Standards.
2. Test curves shall cover full range of operation from shutoff to maximum capacity, and have capacity plotted as abscissas, and operating head, brake horsepower, net positive suction head required (NPSH_{rq}) and efficiency plotted as ordinates. Each test shall be witnessed by a registered professional engineer, who may be an employee of manufacturer. Registered engineer will sign and seal all copies of pump curves and shall certify that hydrostatic tests were performed.
3. Test points:
 - a. Shut off.
 - b. Maximum run out.
 - c. Design operating condition.
 - d. Two additional points, 1 on each side of design operating condition.
4. Test tolerances:
 - a. Pumps shall be within 1 or other of following tolerance:
 - 1) At rated head: +10% of rated capacity.
 - 2) At rated capacity: +5% of rated head.
 - b. No minus tolerance or margin shall be allowed with respect to capacity or total head at rated or specified condition.
 - c. Pump manufacturer shall provide shop space, tools, equipment, instruments, personnel, and all else required for satisfactory completion of tests. Payment for tests shall be included in Contract amount.

- d. Certified test curves shall be submitted and reviewed prior to pumps being released for shipment.

B. Pump tests:

1. Pump manufacturer shall perform following inspections and tests on pumps prior to shipment:
 - a. Inspect for conformance to Contract Documents with respect to correct model number, motor rating, and electrical connections.
 - b. Test motor and seal housing chambers for moisture content or insulation defects.
 - c. Prior to submergence, allow pump to run dry to establish correct rotation and mechanical integrity.
 - d. Discharge piping attached to pump shall operate submerged under a minimum of 6' (1.8 m) of water for a minimum of 30 minutes.
 - e. After operational test, motor and cable shall be tested again for moisture content or insulation defects.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install access frame and cover in wet well concrete cover.

3.2 MANUFACTURER'S FIELD SERVICES

- A. Provide qualified service representative to perform functions described in Section 01 43 00.
- B. Test removal and replacement of pumps to prove the pumps and guiderail systems are properly installed and aligned.
- C. After installation of pumping equipment, and after inspection, operation, testing and adjustment have been completed by manufacturer's field service technician, conduct running test for each pump in presence of the Engineer to determine its ability to deliver its rated capacity under specified conditions.

1. Field testing will not be conducted without an approved procedure and calibration certificates for all testing equipment, gauges and flow meters.
 2. During tests, observe and record head, capacity and motor inputs.
 3. Immediately correct or replace all defects or defective equipment revealed by or noted during tests at no additional cost to the Owner.
 4. Repeat tests until specified results are obtained.
 5. Contractor to provide all labor, piping, equipment, portable flow meters, calibrated gauges or calibrated test gauges, and materials for conducting tests. Tests will not be acceptable if equipment calibration is not within 60 days of the field testing.
- D. Calibrate transmitters and receivers to imposed input values representing 0 percent, 50 percent, 80 percent and 100 percent of full scale. Calibrate all process sensing variables and control signals using test equipment, (such as manometers for process pressure sensing and digital voltmeters for electronic control signals) which is at least five times more accurate than instrument to be calibrated.
- E. Adjust secondary functions such as alarm actuations during initial calibration, and demonstrated after system is placed in service.
- F. Conduct process calibration on all measuring systems. Document for records and submit to Engineer.

3.3 PUMP SCHEDULE

Service	Chatham Lift Station: municipal wastewater, continuous duty
Type	Submersible Non-Clog
No. Req'd	2
Rated Operating Capacity TDH	1310 GPM @ 35 TDH
Full Load Synchronous Motor Speed Maximum	1184 RPM
Min. Hydraulic Efficiency at Max. Pump Speed	69%
Min. / Max. Motor HP	20 / 27

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement will not be made for the Work specified in this Section.

4.2 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum price for SUBMERSIBLE SOLIDS HANDLING PUMPS AND APPURTENANCES.

SUMP PUMP SYSTEM SECTION 22 14 29

PART 1 – GENERAL

1.01 SUMMARY

- A. Furnish and install two (2) dry submersible sump pumps.
- B. Work includes: Pumps, motors, discharge piping to outfall, and piping / electrical appurtenances as required.

1.02 RELATED WORK:

- A. Section 01 33 00: Submittals
- B. Section 26 05 00: Electrical Work – General
- C. Section 26 05 33: Electrical Conduit
- D. Section 26 05 16: Electrical Wires and Cables

1.03 SUBMITTALS

- A. Provide submittals in accordance with Section 01 33 00.
- B. Submittals to include pump technical information, materials of construction, head curves, solids handling capabilities, motor data, and data on proposed accessory equipment as specified herein. Submittals also to include operation and maintenance manuals as specified in Division 1.
- C. Additional submittals shall include discharge PVC piping, check valve, ball valves, couplings, fittings and other discharge accessories.

PART 2 - PRODUCTS

2.01 PUMPS

- A. Each sump pump shall be of cast iron construction with anti-clog vortex impeller capable of passing ½ inch solids, 1/3 horsepower motor for 115 V, single phase, 60 HZ service with a 20 foot long power cord and piggyback mounted diaphragm pressure switch.
- B. Model shall be SD33A as manufactured by Hydromatic or approved equal.

2.02 DISCHARGE PIPING AND ACCESSORIES

- A. Discharge piping shall be 1-1/2 inch PVC SDR 26 with fusion welded joints.
- B. Fittings, check valves, ball valves, couplings, and other discharge piping accessories shall be provided by a single supplier.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install pump units in accordance with the manufacturer's recommendations and approved shop drawings.
 - 1. Clean before pump installation.
 - 2. Complete all piping and wiring, make adjustments to equipment to provide complete operating system.
 - 3. Within two feet of the pump discharge, provide and install a flexible connection to reduce transfer of vibration to the piping, one 1-1/2 inch PVC check valve, and one 1-1/2 inch PVC ball valve.
 - 4. Confirm that the sump pump will operate within the manufacturer's recommended operating range without closing the ball valve more than 25% and provide additional vertical piping if needed to meet this requirement.
 - 5. Piping shall extend and discharge to the manhole upstream and adjacent to the lift station wet well.
 - 6. Discharge piping from the two sump pumps shall not combine, but shall discharge independently into the discharge manhole.
 - 7. Outfall into the discharge manhole shall include a turn down 90° bend fitting followed by 2-feet of pvc piping.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum price for SUMP PUMP SYSTEM.

--- END OF SECTION ---

ELECTRICAL WORK - GENERAL
SECTION 26 05 00

PART 1 – GENERAL

1.01 SCOPE

- A. Provide complete and operational power systems, grounding systems and other specified systems, including the installation and wiring of miscellaneous equipment and devices. Perform all work and testing as indicated and specified.
 - 1. Provide conduit, wiring and connections for power, control, instrumentation and alarms for equipment furnished by others unless otherwise specified and indicated.
 - 2. Provide temporary electrical service, power to temporary pumps as required, and circuits, overcurrent devices, conduit and wiring, and other equipment required during construction and change-over from existing to proposed electric system. Perform work at the convenience of the Owner.
 - 3. Raceways supports and equipment anchoring shall be provided as specified in the Division 26 sections which form a part of the Contract Documents.
 - 4. Electrically powered equipment and devices provided under other divisions and sections of the specifications.
- B. Earth and rock excavation, backfill, concrete masonry, concrete reinforcement, and construction joints required for Electrical work shall be provided under other Divisions of Work specified under this contract.

1.02 RELATED WORK:

- A. Division 1: General Requirements
- B. Division 2: Site Work
- C. Division 3: Concrete
- D. Division 22: Plumbing
- E. Division 33: Utilities
- F. Disconnecting, removing, and relocating existing electrical equipment is a part of this Contract and is specified under Section 02 41 00.

1.03 SUBMITTALS:

A. Submit the following in accordance with Section 01 33 00 - Submittals:

1. Shop Drawings and Data: Include manufacturer's drawings, bills of material, panel and equipment layouts, catalog data, schematics diagrams, interconnection diagrams, wiring diagrams and other documentary or descriptive information as required for each assembly submitted in one package insofar as possible.
 - i. Bills of material: Include a numbered list of all components, with manufacturer's name, catalog number, rating, and other identification. Place item number or similar identification on all other drawings where item appears.
 - ii. Where additions and modifications are made to existing equipment, provide drawings which include both retained existing equipment and new work.
 - iii. For informational purposes only, submit equipment installation instructions in separate submittals from other shop drawings.
 - iv. Shop drawings and data are required for the following list:
 1. Circuit Breakers
 2. Conduit and Fittings
 3. Wire and Cable
 4. Wiring Devices
 5. Generator Male Receptacle
 6. Explosion proof pull / terminal Box
 7. Handholes, and Associated Equipment and Devices
 8. Grounding Equipment and Devices
 9. Control Stations
 10. Enclosures

11. Control Panels

12. Double throw fused Safety Switch – service entrance rated

13. Field Acceptance Test Reports

14. Record Drawings

- v. Mark shop drawings and data submitted to indicate items applicable to this specific contract.
- vi. Include one-line diagrams, schematic diagrams, wiring diagrams, control sequence diagrams, relay diagrams, and metering. Submit only completed drawings showing all local and remote devices associated with each item. Submit one complete package of shop drawings. Partial submittals will be returned without action.
- vii. Install permanent nameplates on all devices or pieces of equipment such as starters, relays, contactors, pushbuttons, indicating lights, switches, RTU enclosure, control panel, pull/terminal boxes, and generator receptacle. Ensure position of nameplates readable after equipment installation.
- viii. Submit arc flash calculation for the lift station and provide plastic coated label on control panel with the results of the study.

1.04 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01 43 00 and as specified.
- B. Install electrical work in conformance with latest rules and requirements of National Fire Protection Association Standard No. 70 (National Electrical Code), the Village of Buffalo Grove, IL, and Commonwealth Edison.

1.05 INTERFERENCE AND ERRONEOUS LOCATIONS:

- A. Locations of electrical equipment, devices, outlets, and similar items, as indicated, are approximate only. Exact locations shall be determined during construction.
- B. Verify in field, all data and final locations of work installed under other sections of specifications, required for placing of electrical work.
- C. In case of interference with other work or erroneous locations with respect to equipment or structures, furnish all labor and materials to complete the work.

1.06 APPROVAL AND MARKING EQUIPMENT:

- A. Ensure that devices and materials are listed and/or labeled by Underwriters Laboratories, Inc., wherever standards have been established by that agency. Where Underwriters Laboratories listing is not available for equipment, submit certified test reports of Nationally Recognized Testing Laboratory, approved by the local inspecting authority, indicating that equipment is in conformance with local code requirements or any other applicable requirements. Tests and inspections for approval of equipment shall be performed at no additional cost to Owner.
- B. Clearly mark equipment, devices and material with name or trademark of manufacturer and rating in volts and amperes and other pertinent information on a nameplate.

1.07 ELECTRIC SERVICE:

- A. The existing electrical power system for the Chatham Lift Station is 277/480V 3-phase.

1.08 EQUIPMENT SPECIFIED ELSEWHERE:

- A. Certain items of control equipment and other equipment are indicated on electrical drawings for connection, but are specified in other sections pertaining to plumbing, mechanical process, instrumentation, etc. Such items are not furnished as part of electrical work.

1.09 ALTERATIONS:

- A. All modifications or alteration to existing electrical facilities required shall be made to successfully install and integrate the new electrical equipment as shown. All modifications to existing manholes, equipment, panels or cabinets shall be made in a professional manner with all coatings repaired to match existing.
- B. Provide temporary wiring as needed for equipment intended to operate during alterations.
- C. Where existing equipment including wiring is in the way of new Work and is required to be relocated, disconnect electrical circuits, relocate equipment as directed, and reestablish circuits.

1.10 ELECTRICAL SHUTDOWN:

- A. When an electrical shutdown is necessary, notify the Owner stating when shutdown is wanted, work planned during shutdown, and estimated shutdown time.

- B. Plan work to minimize shutdown. Before starting, have equipment to be used unpacked, checked for damage, and checked dimensionally to ensure proper fit.

1.11 INCOMING SERVICE:

- A. Contact the following organization for coordinating electric service requirements:

ComEd
New Business Engineering
1500 Franklin Blvd.
Libertyville, IL 60048
Robert Navarrete: (847) 816-5384

- B. The organization identified above will furnish:

- 1. Meter

- C. The Contractor shall provide the following in accordance with the contract documents:

- 1. Meter enclosure including bypass device with 100% bypass capacity.
- 2. Secondary cables of sufficient length for termination at the transformer.

- D. Charges and fees by Power Company for providing the permanent electrical service is a contingency item paid by Owner, and is included in the contract as an allowance. All other charges and fees including but not limited to temporary service and power used will be at no additional cost to the Owner. These other charges shall include provision for temporary service during construction and costs associated with by-pass pumping.

- 1. Perform all work in accordance with power company's requirements and in manner approved by Power Company.
- 2. Notify Power Company, in writing, within two weeks after the contract award date concerning incoming service requirements.

- E. The final, complete installation shall comply with all state and local statutory requirements having jurisdiction. The Contractor shall arrange for all necessary permits, pay all fees and arrange for all required inspections by local authorities. All work shall comply with the requirements of the National Electrical Code, all state codes and the codes and ordinances of the city or town in which the work is to be done.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Standard Products

The equipment furnished shall be standard products in production by reputable companies regularly engaged in the manufacture of high-quality equipment of the type specified. Similar equipment shall have been in satisfactory and successful operation for a period of at least two years. All parts of the specified equipment shall be so designed as to be especially adapted for the service required and shall be proportioned, enclosed, or guarded as to have ample and liberal strength and stability to withstand, without damage, the stresses to which they may be subjected during erection or operation. The component parts of duplicate items shall be fabricated on a principle of interchangeability to facilitate ready replacement.

B. Materials

All material incorporated in the equipment shall be new and of first-class quality, free from injurious defects and imperfections, and of the classifications and grades designated. Materials not specifically designated herein shall be subject to the review of the Owner's Representative and shall be suitable for the purpose intended.

C. Identification Symbols and Nomenclature

Identification symbols and nomenclature where used throughout these Specifications are the same as those shown on the Drawings. Paragraphs of the Specifications describing the requirements of a single item of equipment shall apply equally to all identical items of equipment to be furnished.

D. Power Company: Secondary metering equipment furnished by power company as follows:

1. Meter

E. Electrical Contractor: Secondary metering equipment installed by Electrical contractor as follows:

1. Meter (furnished by Power Company)
2. Meter enclosure (furnished by Electrical Contractor from Power Company approved metering equipment enclosure list.)

2.02 RATINGS

A. The sizes, ratings, capacities, and performance characteristics of various specified items of equipment and devices are based on currently available standard

products, which are available through United States manufacturers. In no case shall the size, rating, capacity or performance characteristic be less than that specified unless approved in writing by the Owner's Representative. Ratings and performance characteristics, where applicable, of various devices and items of equipment are specified in respective Sections of these Specifications. All electrical equipment shall be UL rated.

2.03 DETAILS OF CONSTRUCTION

- A. Electrical work shall meet requirements of these Specification, product manufacturer's instructions, recommended tolerances and recommended procedures, and as indicated by final reviewed submittals for the Work.
- B. Materials shall be of size and thickness indicated. If not indicated, size and thickness shall be selected to provide strength and durability in finished Work for intended application. Work to dimensions indicated, using proven fabrication details.
- C. Product finishes, surfaces and edges shall be smooth and free of marks, burrs, seams, roughness and like defects or conditions.
- D. Other electrical-mechanical product construction details shall be in accordance with the best engineering practices, applicable code requirements and as specified in other Sections of these Specifications.

PART 3 – EXECUTION

3.01 GENERAL

- A. The Contract Drawings indicate the general details necessary for the complete electrical installation. It shall be the Contractor's responsibility to install all electrical work in a neat and workmanlike manner. The Contractor shall cooperate with others to permit the installation of all of the Work without interferences. If changes become necessary to avoid interference between the Work installed under various Sections, the Contractor shall submit to the Owner's Representative, for review, the proposed changes and upon review by the Owner's Representative, proceed with the installation of such changes without additional cost to the Owners.
- B. The Contractor shall maintain at the site a set of black-line prints on which shall be accurately shown the actual installation of all Work done under Division 16 and any variation from the Contract Drawings as reviewed by the Owner's Representative including changes in sizes, locations, and dimensions shall be indicated thereon. At the conclusion of the Work, the Contractor shall furnish record drawings in accordance with the General Conditions and as specified herein.

3.02 FACTORY TEST AND INSPECTION

- A. All equipment shall be shop-assembled and tested in the manufacturer's shop in accordance with recognized standard practices. Factory tests and inspections shall be conducted to verify that the equipment is operating satisfactorily and in compliance with the Specifications.

3.03 INSTALLATION AND TESTING

- A. General: Examine the areas and conditions under which electrical work is to be installed or performed and remedy any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.
- B. Existing Facilities: Verify existence, location, and operation of existing electrical facilities to be abandoned, removed, altered, modified and/or temporarily relocated to allow activities during construction of the Work.
- C. Install electrical work. Meet requirements of these Specifications, product manufacturer's instructions, recommended tolerances, and recommended procedures and as indicated by final reviewed submittals for the Work.
- D. Trenching and Backfilling. Unless otherwise specified, trenching and backfilling for conduit, cable, etc. shall be in accordance with IDOT Standard Specifications.
- E. Tests: Comply with the requirements of Section 26 05 00 as a minimum, and as specified in other Sections of these Specifications.

3.04 METERING EQUIPMENT:

- A. Install metering equipment as follows:
 - 1. Ensure that metering equipment installation shall be in accordance with requirements of Power Company by submitting drawings, sketches, catalog information and other appropriate material for power company approval.

3.05 REMOVAL AND RELOCATION OF MATERIAL AND EQUIPMENT:

- A. Carefully dismantle and salvage electrical equipment, switches, fixtures, conduits, cables, wiring, boxes, as necessary to carry out proposed changes.
 - 1. The Owner shall mark any additional equipment that is to be delivered to the Village.
- B. Remove from site and dispose of material and equipment not indicated for reuse.

3.06 WORK AT EXISTING LIFT STATION SITE:

- A. Each bidder or his authorized representative shall, before preparing his proposal, visit all areas in which work under this bid is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that he or his representative has visited the site and noted the location and conditions under which the work will be performed and that he takes full responsibility for a complete knowledge of all factors governing his work.
- B. In the area of the work, disconnect and carefully remove the existing electrical equipment and devices so noted. With the exception of items indicated as having to be re-used, items specifically noted by the Owner before start of work shall be turned over to the Owner. If not required by the Owner, remove them from the premises and site. All existing electrical equipment and devices indicated as not removed or abandoned are to be maintained in operation and any circuits disturbed by the construction shall be restored.
- C. Maintain existing electrical services and systems to the lift station throughout the project and all "down-time" shall be scheduled at least two weeks in advance with the permission of the Engineer and such scheduling shall be rigidly adhered to.

3.07 DEMOLITION:

- A. Survey the existing electrical systems and equipment identified for removal with representative from the other trades prior to performing any demolition work. Identify all conduit and equipment to be removed with tags or paint. The Owner will indicate any equipment to be removed and given to the Owner.
- B. Where a piece of equipment is to be removed all associated ancillary components (e.g. solenoid valves, pressure switches, etc.) and associated wiring and conduit shall also be removed.
- C. Equipment, building or structures scheduled for complete demolition shall be made safe from electrical shock hazard prior to demolition. Disconnect all electrical power, communications, alarm and signal system.
- D. Equipment scheduled to be turned over to the Owner shall be carefully disconnected, removed and delivered to the Owner where indicated. Provide labor, hoisting and transportation of the equipment. All other miscellaneous electrical materials, devices, etc., associated with the equipment being turned over shall be demolished and removed from the site.
- E. Unless otherwise specifically noted, remove unused exposed conduit and support systems back to point of concealment. Remove unused wiring back to source (or nearest point of usage).

- F. Disconnect and remove abandoned panelboards, disconnect switches, control stations, distribution equipment, etc.
- G. Disconnect and remove abandoned luminaries. Remove brackets, stems, hangers and other accessories.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- I. Coordinate electrical power outages to the electrical systems and equipment with the Owner. Where duration of proposed outage cannot be allowed by the Owner, phase the retrofit work to allow the system or equipment to be re-connected to the electrical power system within the time frame allowed by the Owner or provide temporary power connections as required to maintain service to the systems or equipment. The temporary power can be from a generator or another part of the facility not affected by the outage provided there is sufficient spare capacity.
- J. Continuous service is required on all circuits and outlets affected by these changes, except where the Owner will permit an outage for a specific time. Obtain Owner's consent before removing any circuit from continuous service.
- K. The electrical and process equipment to be removed or relocated under this contract has been identified on the Drawings. Survey the affected equipment and lift station areas before submitting bid proposal.
- L. Trace out existing wiring that is to be relocated, or removed and perform the relocation or removal work as required for a complete operating and safe system.
- M. All equipment, materials, controls, motor starters, branch and feeder breakers, panelboards, transformers, wiring, raceways, etc. furnished and installed to temporarily bypass the lift stations shall be removed when the permanent installation is fully operational.

3.08 PROTECTION OF ELECTRICAL EQUIPMENT:

- A. Protect electrical equipment from the weather, especially from water dripping or splashing upon it, at all times during shipment, storage, and construction. Do not store equipment outdoors. Where equipment is installed or stored in moist areas, or unheated buildings, provide acceptable means to prevent moisture damage. Provide uniformly distributed source of heat in electrical equipment to prevent condensation and damage to electrical insulation systems.

3.09 DEFECTIVE OR DAMAGED EQUIPMENT:

- A. Do not install equipment or material that was subjected to possible water damage.

3.10 EQUIPMENT ENCLOSURE:

- A. The equipment enclosure classification of the lift station areas are NEMA 4X, Type 316 stainless steel. Provide all equipment, devices and material meeting the requirements of this schedule unless otherwise noted or specified.

3.11 DRAWINGS AND SPECIFICATIONS:

- A. Drawings and specifications are typical of work to be done and of the arrangement desired. Provide accessories and appurtenances which the Engineer deems functionally necessary for a complete installation, whether or not explicitly indicated or described.
 1. A set of red-lined "as-built" electrical drawings shall be carefully maintained at the job site. Actual condition are to be put on the Drawings in red on a daily basis so the drawings will continuously show location and routing of conduits, pull boxes, circuit numbers, and other information as required.
 2. At the completion of the project, provide two sets of drawings that are marked to show the as-installed equipment, devices, duct locations and wiring. These sets are to be provided to the Owner. The markings on the drawings are to be neat, clean and legible.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

ELECTRICAL WIRES AND CABLES
SECTION 26 05 16

PART 1 – GENERAL

1.01 SCOPE

- A. Provide wires and cables for complete electrical systems as indicated and specified.

1.02 RELATED WORK:

- A. Section 26 05 00: Electrical Work – General

1.03 REFERENCES:

- A. American Society for Testing and Materials (ASTM):

- B3: Soft or Annealed Copper Wire.

- B8: Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft.

- B33: Tinned Soft or Annealed Copper Wire for Electrical Purposes.

- B. National Fire Protection Association (NFPA):

- NFPA-70: National Electrical Code (NEC).

- C. Underwriters Laboratories, Inc. (UL):

- U.L. 44: Thermoset-Insulated Wires and Cables

- U.L. 83: Thermoplastic-Insulated Wires and Cables

- U.L. 854: Service Entrance Cables

- D. D. Insulated Cables Engineers Association, Inc. (ICEA)/National Electrical Mfg's Association (NEMA):

- ICEA S-61-4021/WC 5: Thermoplastic Insulated Wire & Cable.

- ICEA S-66-524/NEMA WC7; Cross-Linked-Thermosetting-Polyethylene Insulated Wire and Cable

- ICEA S-68-516/WC 8: Ethylene-Propylene-Rubber-Insulated Wire & Cable.

1.04 SUBMITTALS:

- A. Submit the following in accordance with Section 01 33 00 - Submittals: Submit shop drawings and manufacturer's product data in accordance with the requirements of Section 26 05 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. 600V Cable:

Okonite Company.

Southwire Company, LLC.

USA Wire & Cable, Inc.

Or acceptable equivalent product.

- B. Control and Metering Wire:

Belden Wire and Cable

Alpha Wire

2.02 MATERIALS AND COMPONENTS:

- A. A. Furnish copper conductors. Material and stranding of conductors to conform to ASTM B3, ASTM B33, and to ASTM B8, for the appropriate class.
- B. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing not older than 12 months.
- C. Wires and Cables for Maximum 600-Volt Power Circuits: For #8 and smaller provide type XHHW-2. Where used in lighting or receptacle branch circuits provide No. 12 and No. 10. Provide wire with Class C stranding. Provide No. 6 AWG and larger as XHHW-2 with Class B stranding. Provide wires and cable conforming to UL 83.
- D. Shielded Cable for Instrumentation Wiring: 7 –strand copper conductors, size No. 16 AWG. Insulate conductors individually with color coded polyethylene or polyvinylchloride. Twist pairs with varying lay (if more than one pair) and cover with cable tape and copper or aluminum coated Mylar shielding tape and tinned copper drain wire. Jacket: polyvinylchloride. Cables: rated 600 volts and 90 degrees C, and listed for installation in wet location.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Perform work in accordance with the National Electrical Code.
- B. Provide power cable identification as follows:

System Voltage	Neutral	Phase A	Phase B	Phase C
208/120V	White	Black	Red	Blue
240/120V	White- Gray Stripe	Black- Blue Stripe	Red- Blue Stripe	None
120/240V 3 phase	White Gray Stripe	Black Blue Stripe	Orange Blue Stripe	Red
480/277V	Gray	Brown	Orange	Yellow

- C. Use green to identify insulated ground conductors.

NOTE: Colored insulation, tapes or sleeves may be used to provide color coding. Insulated ground conductors must have green covering.

- D. Permanently identify each grounded and ungrounded conductor for each nominal voltage system at each Pump Control Panel. For 120/240V 3 phase system, the high leg to ground (208V) conductor shall be ORANGE.

3.02 INSTALLATION OF WIRING:

- A. Unless otherwise indicated, use no conductor smaller than No. 12 AWG for power, No. 14 AWG for control, and No. 16 AWG for shielded applications.
- B. Number and sizes of wires and conduits indicated are a guide only and are not necessarily correct for the actual equipment installed. Install as many wires and conduits as necessary for complete electrical system, and provide adequately for the equipment actually installed.
- C. Install conductors continuous from outlet to outlet and make no splices except within outlet or junction boxes.
- D. Install cable in underground raceway system without splices. There shall be no splices between connection points unless otherwise indicated.

- E. Draw all conductors contained within a single conduit at the same time.
- F. Apply wire pulling compound to conductors being drawn through conduits. Use a pulling compound compatible with the conductors being installed.
- G. Use no cable bend with radius of less than eight times its diameter.
- H. Wires and cables installed without prior submittal review are subject to removal at no additional expense.

3.03 CONDUCTOR IDENTIFICATION:

- A. Label each wire at both termination points. Carry individual conductor or circuit identification throughout, with circuit numbers or other identification clearly stamped on terminal boards and printed on directory cards in distribution cabinets and panelboards.
- B. Identify each wire in junction boxes, cabinets, and terminal boxes where total number of control, indicating, and metering wires is three or more and no terminal board is provided, including all power wire. Where no termination is made use a plastic-coated, self-adhesive, wire marker and where termination is made use a, plastic, pre-printed sleeve wire marker.
- C. In cases similar to above where terminal boards are provided for the control, indicating, and metering wires, identify all wires including motor leads and other power wires too large for connection to terminal boards, by sleeve wire markers as specified above.
- D. In manholes and handholes, identify each power wire by laminated plastic tag located so it is easily seen. Control wires to be bundled and marked as listed in conduit and wire schedule.

3.04 CONNECTORS, TERMINAL LUGS AND BOARDS:

- A. For wiring of circuits consisting of No. 10 or No. 12 AWG, such as for lighting branch circuits, use self-insulated pressure type connectors for all splices or joints.
- B. Terminate all wires connected to terminal boards, terminal blocks, or to other similar terminals by means of ring and tongue, nylon self-insulated, tin-plated copper pressure terminals.
- C. Terminal boards shall be 600 volts and rated for 125% of the ampacity of the connected circuit. They shall have screw terminals, with white marking strips for

wire identification. Terminate only one wire on a terminal, including ground wires, unless rated for more.

- D. Wire connections for which terminals are not supplied, for example, at solenoids or motor terminal junction boxes:

10AWG and smaller: Use self insulated pressure-type connectors.

8AWG and larger: Use insulated, mechanical type with set screw or follower bearing directly on the wire. Split bolt connectors are not acceptable.

- E. Clearly and permanently mark terminal strips with ink or indelible pencil. Mark each wire consistently throughout entire system. Use the notation given on manufacturer's wiring diagrams wherever possible.

3.05 TESTING:

- A. Perform tests of all cables prior to energizing in accordance with Section 01 43 00.
- B. Submit results of all cable tests on forms indicating cable size, voltage, time, date, name of tester and witness.

3.06 CONTRACT CLOSEOUT:

- A. Provide in accordance with Section 01 77 00.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for ELECTRICAL WIRES AND CABLES.

--- END OF SECTION ---

**GROUNDING
SECTION 26 05 26**

PART 1 – GENERAL

1.01 SCOPE

- A. Provide a single, complete, integrated grounding system, including conductors, raceways, and connections, indicated and specified, and in accordance with the National Electrical Code Article 250 and the National Electrical Safety Code.
- B. Include grounding of electric equipment enclosures etc., ground electrode systems with ground rod.
- C. Include grounding conductors completely inter-connecting water supply pipe, ground rods, ground grid, other distribution equipment, and other groundable equipment.

1.02 RELATED WORK:

- A. Section 26 05 00: Electrical Work – General
- B. Section 26 05 33: Electrical Conduit

1.03 REFERENCES:

- A. American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE):
 - 1. ANSI-C2-/IEEE: National Electrical Safety Code.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA-70: National Electric Code.

1.04 SUBMITTALS:

- A. Submit the following in accordance with Section 01 33 00 - Submittals:
 - 1. Submit shop drawings and manufacturers' product data in accordance with requirements of Section 26 05 00.
 - 2. Submit information on:
 - i. Ground rods

- ii. Exothermic welding
- iii. Connecting hardware

PART 2 – PRODUCTS

2.01 MANUFACTURER'S COMPLIANCE:

- A. Manufacturer's acceptance contingent upon products' compliance with the specifications.

2.02 MANUFACTURERS:

A. Ground Rods:

- 1. ERICO Products Inc.

B. Exothermic Welding:

- 1. ERICO Products, Inc.
- 2. Or an acceptable equivalent product.

C. Connecting Hardware:

- 1. ERICO Products Inc.
- 2. Thomas and Betts
- 3. Or an acceptable equivalent product.

2.03 MATERIALS AND COMPONENTS:

A. Conductors:

- 1. Provide copper grounding conductors bare or insulated, sized as indicated or as required by the NEC. Minimum bare conductor size shall be No. 2 AWG. Provide protection of conductors if physical damage would result from direct exposure.
- 2. Provide bare conductors where conductors are buried in the earth or where they are embedded in the concrete.

- B. Ground Rods: Provide 5/8-inch diameter, 10-foot long copper-clad steel ground rods where indicated. Where rock is encountered, grounding plates may be used in lieu of grounding rods.

C. Connections:

1. Provide silicon bronze ground clamps for use on copper or brass pipes which are U.L. listed.
2. Provide ground clamps, for use on iron pipes, of galvanized or malleable iron, or of standard noncorrosive material.
3. Furnish ground clamps, for use on pipes, with rigid metal base providing good contact by proper seating on the pipe. Do not use strap type clamps.
4. Provide copper-clad steel ground rods; Make cable to ground rod connection without passing over end of ground rod.

PART 3 - EXECUTION

3.01 EXOTHERMIC WELDING:

- A. Welding shall be by the exothermic process.
- B. Within the welding procedure, include the proper mold and powder charge and conform to the manufacturer's recommendations.
- C. Welding processes shall be the exothermic fusion type that will make a connection without corroding or loosening.
- D. The welding process shall join all strands and not cause the parts to be damaged or weakened.
- E. Completed connection or joint shall be equal or larger in size than the conductors joined and have the same current-carrying capacity as the largest conductor.
- F. Paint buried ground connection with a bitumastic paint.

3.02 INSTALLATION OF GROUNDING CONDUCTORS:

- A. Install grounding conductors so that they will not be exposed to physical damage. Install connections firm and tight. Arrange conductors and connectors so no strain on connections. Grounding conductors for support structures, antenna, pressure transmitter, and light pole shall be installed in PVC conduit passing through the concrete base or slab for each of these pieces of equipment. Conduit shall pass through and extend 6 inches from the side of the concrete to allow for future maintenance and replacement as required.

- B. Run grounding conductors associated with concrete ductbank in common trenches.
- C. Bury equipment grounding conductors 30 inches deep. Bring loops or taps up for connection to equipment or other items to be grounded.
- D. Where raceways are used to contain and protect grounding conductors, install in accordance with Sections 26 05 33.
- E. Where bare grounding conductors are contained within metallic raceways, bond ends of raceways to conductors.
- F. Install loop type, low impedance, grounding system interconnecting all components so at least two grounding connections are provided for each major item of electrical equipment. Ensure that severing of any single grounding conductor in this system does not remove grounding protection on any major item.
- G. Buried and concealed ground connections shall use exothermic welding.
- H. Make accessible connections to structural members by exothermic welding process or by bolted connector. Connections to equipment or ground bus by bolted connectors.

3.02 INSTALLATION OF GROUND RODS:

- A. Install ground rods near equipment as indicated on schematic. Install the top of the rod 12-in. below the ground surface.
- B. Make connection to overall grounding system as indicated.
- C. Ensure that final resistance of interconnected ground system is 5 ohms, or less. Measure ground resistance in normally dry conditions, and not less than 48 hours after rainfall.

3.03 EQUIPMENT GROUNDING:

- A. Ground each piece of electrical equipment by means of a grounding conductor installed in raceway feeding that piece of equipment. Grounding conductors installed in conduit with insulated conductors to be furnished with green, 600-volt insulation. Ground conductors are in addition to and not to be considered as the neutral wire of the system.
- B. Connect power transformer cases and neutrals to grounding system. Connect neutral ground connection at transformer terminal. Provide two separate,

independent, diagonally opposite, connections for power transformers so removal of one connection will not impair continuity of other.

- C. Connect a grounding conductor between panelboard and grounding system. Where a grounding bar is furnished with panelboard, connect grounding conductor to bar.
- D. Where conduits are not effectively grounded by firm contact with a grounded enclosure, apply grounding bushings on at least one end of conduit run.
- E. Ground wire fences when used to enclose electrical equipment or when overhead electrical lines cross fence. Unless otherwise indicated, provide grounding by buried outside peripheral ground loop; connections to each corner fence post and nearby ground rod; flexible connections to each gate; and at least two connections to grounding system from approximately opposite positions on fence.

3.04 SIGNAL GROUNDING:

- A. Ground signal surge protection and shields of twisted, shielded cable using a signal bonding conductor. The signal bonding conductor shall be a continuous path from the instrument surge protection or shield to the grounding electrode conductor. The signal bonding conductor shall be isolated from the equipment grounding conductor for its entire path.
- B. Where convenient several signal bonding conductors may be combined, providing that all the following conditions are met:
 - 1. The combined signal bonding conductor shall have the equivalent cross section of the conductors that it was combined from or three times the cross section of the largest conductor that it was combined from, whichever is less.
 - 2. The combined signal bonding conductor shall be isolated from the equipment grounding conductor.
 - 3. Where two signal bonding conductors are combined use a three port insulated splice.
 - 4. Where three or more signal bonding conductors are combined, use a copper bus mounted on 600V insulators. Attach each conductor to the bus using an insulated ring tongue lug and screw terminal.

3.05 TESTS AND CHECKOUTS:

A. Testing shall not be performed within 48 hours of rainfall. Dry season resistance of each electrode(s) shall not exceed 5 ohms. If such resistance cannot be obtained with the system as installed, additional grounding rods shall be provided as required.

B. Furnish copies of test reports on ground system.

3.06 CONTRACT CLOSEOUT:

A. Provide in accordance with Section 01 77 00.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum prices for GROUNDING.

--- END OF SECTION ---

**ELECTRICAL CONDUIT
SECTION 26 05 33**

PART 1 – GENERAL

1.01 SCOPE

This Section covers the general provision for furnishing and installing all conduits, related boxes and fittings, and associated accessories as required for the electrical power, control, annunciation, instrumentation, communication, and lighting systems as shown on the Drawings and as specified herein. All necessary hardware including, but not limited to screws, bolts, hangers, concrete inserts, clamps, locknuts, bushings, sealing bushings, couplings, pulling-in irons, identification tags, etc. shall be included.

1.02 QUALITY ASSURANCE

A. Acceptable Manufacturers

Shall include but not be limited to Allied Tube & Conduit, Republic Conduit and Wheatland Tube Company.

B. Applicable Standards

All Work shall conform to the applicable provisions of the codes, standards, and Specifications, as specified herein, and the following:

Name	Abbreviation
Specifications for Rigid Steel Conduit, Zinc Coated	ANSI C80.1
Specifications for Fittings for Rigid Metal Conduit and Electrical Metallic Tubing	ANSI C80.6
Conduit Fittings and Accessories	NEMA FB-1
Outlet Boxes and Fittings	UL-514
National Electrical Code	NEC

1.03 SUBMITTALS

- A. The Contractor shall submit to the Owner's Representative for review drawings, product specifications and descriptions, together with operating and maintenance instructions, specified in Section 01 33 00 of all equipment furnished.

- B. As part of the Record Drawings submitted, the Contractor shall submit a conduit schedule at the completion of the Project.

The conduit schedule shall contain, as a minimum, the following information for each run of conduit.

1. Conduit designation.
2. Conduit type and size.
3. Routing: the routing shall identify the equipment (from-to) connected at the conduit termination.
4. Description of cables installed in the conduit including function of cables.

PART 2 - PRODUCTS

2.01 GENERAL

Electrical conduit and related fittings shall be U.L. listed. The conduit inside diameter shall have a smooth finish to facilitate fishing and/or pulling of wires and cables. Where flexible conduits are used they shall be of the liquid tight type.

2.02 SIZE REQUIREMENTS

Conduit smaller than 3/4-inch in diameter shall not be allowed. Conduit sizes shall be as shown on the Drawings. In cases where conduit sizes are not shown on the Drawings, the minimum size shall be in accordance with the applicable provisions of NEC.

2.03 DETAILS OF CONSTRUCTION

A. Rigid Metal Conduit and Fittings

1. Rigid metal conduit shall be heavy wall, hot-dip galvanized steel. Thin wall conduits and metallic tubing are not acceptable unless specifically shown on the Drawing or specified for use in other Sections of these Specifications.
2. Metal conduit fittings and covers shall be galvanized or sherardized iron or malleable iron castings with gaskets as required. Composition or rubber gaskets shall be provided where required to prevent entrance of moisture.
3. Rigid metal conduit expansion joint fittings shall consist of standard manufactured products, designed so as to prevent damage to the cables

and equipped with approved means of providing electrical continuity of the conduit run. Expansion joint fittings shall permit a small amount of transverse movement as well as longitudinal movement. All couplings and fitting joints shall be of the threaded type.

4. Aluminum shall not be used either for conduits, fittings, pullboxes, junction boxes, or any other electrical device, unless otherwise specifically shown on the Drawings.

B. Flexible Liquid-Tight Conduit

1. Flexible liquid-tight conduit shall be "Sealtite Type UA".
2. The conduit shall consist of an interlocked galvanized steel core and a liquid tight cover made of polyvinyl chloride synthetic resin. A ground bonding conductor shall be included.

C. Electrical Metallic Tubing (EMT) and Related Fittings Electrical metallic tubing shall comply with FS WW-C-563 and ANSI C80.3. EMT fittings shall comply with FS W-F-408. EMT shall be provided only as shown on the Drawings or as otherwise specified in other Sections of these Specifications. Couplings, connectors and other fittings for EMT shall be cadmium or zinc plated steel, or cadmium plated malleable iron and shall be rain tight, compression type.

D. Rigid Nonmetallic Conduit

1. Rigid nonmetallic conduit shall be of the polyvinyl chloride (PVC) type, schedule 80 as shown on the Drawings, and shall be in accordance with the applicable requirements of NEC.
2. The conduit, fittings and accessories shall be manufactured from polyvinyl chloride complying with ASTM D1784 and shall comply with all the applicable requirements of NEMA Publication No. TC2, UL 651 for EPC-80-PVC and N.E.C. Article 347.
3. Fittings and accessories for the electrical plastic conduit shall comply with all applicable requirements of NEMA Publication No. TC3.
4. The solvent cement used to join the conduit and fittings shall meet the requirements of ASTM D2564.

E. Outlet, Terminal, and Pullboxes and Covers

Outlet, and pullboxes and covers shall be made of stainless steel. Covers shall be secured with screws. Gaskets shall be provided for all boxes. Terminal boxes

shall be furnished with terminal blocks as required and as indicated on the Drawings.

F. Stainless Steel Junction Boxes

1. Junction boxes shall be mounted on the surface of a structure or embedded in a structure as shown on the plans. The junction box shall be furnished with a cover, gasket, and hardware. Hardware furnished for the cover shall be stainless steel.
2. A grounding lug shall be provided in every junction box. A stainless steel conduit fitting shall be used to connect conduit to a stainless steel junction box.
3. Box covers shall have a continuous formed, seamless, urethane, oil-resistant gasket. The gasket shall be placed directly onto the junction box cover. The gasket shall adhere to the cover without the use of adhesives.
4. Junction box covers shall be attached to the box with un-slotted hex head screws unless otherwise specified.
5. The box shall be made of Type 304 stainless steel, not less than 14 gauge, with all seams continuously welded with stainless steel weld wire and ground smooth. Exterior surfaces shall have a smooth polished finish. The box shall be according to NEMA Type 4X and be UL 50 "Junction and Pull Box", "Junction Box", or "Pull Box".
6. When specified for attachment to a structure, the box shall be suitable for surface mounting, complete with external stainless steel mounting lugs or brackets welded to the box. The box shall have an overlapping stainless steel cover that is secured to the box with a continuous stainless steel hinge and a minimum of four captive stainless steel clamps utilizing captive stainless steel hex-head bolts or deep slotted stainless steel screws.
7. When specified for embedment in structure, the box shall be constructed with the cover arranged to fit flush with the structure surface. The cover shall be attached with stainless steel unslotted hex-head screws.

PART 3 - EXECUTION

3.01 FACTORY TEST AND INSPECTION

Routine factory testing and inspection shall be performed in accordance with the requirements of the applicable standard.

3.02 INSTALLATION AND TESTING

A. General

Any and all excavation, trenching, coring, backfilling, incidental concreting (not part of a structure in which conduits are embedded) and/or concreting required for duct banks, etc. as required for the installation of Electrical Conduit shall be performed by the Contractor at the Contractor's expense. Installation of all raceway conduits and fittings shall be in accordance with these Specifications, manufacturers' recommendations, applicable standards, codes and regulations, and best engineering practices.

B. Installation of Rigid Steel Conduit

1. Installation of all conduits, boxed fittings, and accessories shall conform to the requirements of the "National Electrical Code", insofar as this is applicable. During installation, precaution shall be taken to protect the conduits and conduit threads from mechanical injury. The ends of conduits shall be sealed in an approved manner during installation whenever the work is interrupted. Runs shall be sealed upon completion by the use of caps and discs or plugs. The seals shall be maintained, except during inspection and tests, until the conductors are pulled in. Conduits shall be inspected before conductors are installed and thoroughly cleaned of water and dirt by means of compressed air, swabs or other approved methods. Conduits shall be checked for freedom from obstructions by pulling a wooded mandrel of the proper size through the conduit. All boxes and fittings shall be kept closed and free from dirt, moisture, and debris.
2. Each run of conduit between boxes or equipment shall be electrically continuous. Threads shall conform to ANSI-B2.1 standards for taper pipe threads. Conduits shall be cut square, ends reamed and threads cut with approved dies. Running or non-tapered threads will not be permitted. Conduits entering slip holes in boxes shall be secured with a locknut on each side at the box wall and terminated with bushings.
3. Threaded conduit joints shall be made watertight by use of red lead and oil, white lead and oil, or other approved compounds. Threaded joint compound shall be electrically conductive.
4. Exposed conduit shall be 3/4 inch IPS or larger and shall run in straight lines parallel to walls, beams or columns. Required offsets shall be accomplished by use of uniform offsets, bends, conduit fittings, or standard boxes. Where conduits are grouped, the offsets shall be made in a manner which will present a uniform and symmetrical appearance.

5. Conduits shall be supported as required by NEC. Capped conduit and conduit terminating in boxes or fittings shall be supported as close to the terminal as possible but in no case farther than 3 feet from the terminal. Galvanized clamps, U-bolts, and J-bolts shall be used to fasten conduits. Boxes and equipment housings shall be supported independently of the conduits. Conduits and boxes shall not be fastened directly to concrete but shall be spaced away by means of one inch galvanized metal channels or spacers. Machine screws or bolts set in concrete inserts or cinch anchors shall be used for securing clamps and boxes to concrete or to steel supporting channels. The use of explosive-driven anchors for securing clamps, supports, and boxes to concrete will not be permitted, except in such cases where special permission has been obtained in writing from the Owner.
6. Exposed conduits inside building shall run supported on walls or on trapezes away from wall.
7. Conduit embedded in concrete shall be one inch or larger, unless otherwise shown on the Drawings. Embedded conduit shall be sloped towards drain points and shall be rigidly supported and braced to avoid shifting during placement of concrete. Embedded conduit runs parallel to concrete surfaces shall be located behind the reinforcing steel except at terminal connections to outlets or junction boxes. Conduit extending out of concrete walls, floors, or beams shall be at right angles to the surface.
8. Minimum spacing of conduits embedded in concrete shall be as required by N.E.C. for proper conductor heat dissipation. The minimum spacing shall be maintained except where approaching and entering a box or panel. Conduit spacing shall also permit the flow of concrete between them.
9. Conduits embedded in concrete and terminating at motors or other equipment mounted on concrete bases shall be brought up to the equipment within the concrete base wherever possible.
10. All conduit boxes shall be so located that covers and openings are easily accessible. They shall be installed parallel with building lines, and where embedded shall be flush with the surface of the finished floor, wall, or ceiling. The Contractor shall remove and reset all boxes not properly installed or shifted out of line during concreting, whenever required or directed.
11. Conduits shall have long-sweep field bends wherever possible, but shall in no case have smaller radii bends than are allowed by NEC or as recommended by the manufacturer whichever is the most stringent. All field bends shall be manufactured bends or made with a bending machine

or other approved device. Field bends shall not reduce the internal diameter of the conduit or injure the protective coatings. The bend shall be free of kinks, indentations, or flattened surfaces. Heat shall not be applied. Standard bends shall be used where conduits turn out of the concrete, at the conduit terminations, and at electrical equipment. Where conduits enter switchgear cubicles or other enclosures, they shall be located by template.

12. Where conduits cross expansion joints or contraction joints, they shall be installed perpendicular to the plane of the joint and shall have expansion fittings.

Expansion fittings shall be as follows:

- i. Expansion fittings for exposed conduit shall have external bonding jumpers for ground continuity and shall be O.Z. Electrical Mfg. Co. Type Ex, Crouse-Hinds Type XJ, or equal.
 - ii. Expansion fittings embedded in concrete shall be expansion deflection type consisting of molded neoprene sleeves with bonding jumpers passing through separate waterproof compartments, and two silicon bronze couplings. They shall permit a 3/4-inch expansion and contraction and a 3/4-inch deflection without deformation.
13. All conduits shall be installed as shown on the Drawings, with the exact location and routing to be determined in the field as required.
14. Cable runs shall be segregated so that no two of the following types of cable occupy the same conduit:
 - i. 480/277V power cable.
 - ii. 240/120-V, AC, miscellaneous lighting and receptacle circuit cable; plug-in type.
 - iii. Low voltage or current, DC, control cable.
 - iv. Instrumentation cable.
15. Conduits penetrating walls, ceilings and floors of buildings and/or structures shall be sealed as shown on the Drawings. Sealing of conduit ID shall be by combination seal/drain fittings where shown on the Drawings. Sealing of conduit OD shall be by means of conduit sleeve and sealing compound. Sealing compound shall be of a type approved for the conditions and use.

C. Installation of Flexible Liquid-Tight Conduits

1. Flexible liquid-tight conduits shall be used for connection to motors and to any other equipment subject to vibration. Liquid-tight fittings and connectors shall be used in conjunction with the liquid-tight flexible conduit installation.
2. Flexible liquid-tight conduit lengths shall not exceed 6 feet.

D. Installation of EMT Conduits and Fittings

1. Installation of EMT shall conform to the applicable requirements of rigid steel conduits as previously specified.
2. EMT conduits shall be connected to the outlet boxes and panelboards by means of "gland" type connectors. Couplings between conduits shall be "gland" couplings. Conduits shall enter all couplings and connectors the full distance required and shall be securely held in place by a tightening of a "Locking Nut".
3. EMT shall not be embedded in concrete, used in hazardous locations where explosion-proof equipment is required, or buried in earth. Indentor or set screw type fittings shall not be used.

E. Installation of Rigid Nonmetallic (PVC) Conduits

1. Installation of rigid nonmetallic (PVC) conduit shall conform to applicable requirements of installation of rigid steel conduits as previously specified. Installation of rigid nonmetallic (PVC) conduit shall be as shown on the Drawings and shall be in accordance with the manufacturer's recommended procedures.
2. Installation shall meet the requirements of N.E.C. Article 347 Part A.
3. The conduit shall be cut square. All burrs shall be removed from the inside and outside of the conduit.
4. Bending:
 - i. Bending of the conduit shall be made so that the conduit will not be injured and the internal diameter of the conduit will not be effectively reduced. Bends shall be made with a standard PVC pipe bending equipment.
 - ii. The conduit section shall be heated evenly over the entire length of the bend. The use of torches or other flame-type devices will not be

allowed. Sections showing evidence of scorching or discoloration shall not be acceptable for use on the project.

- iii. The radius of the bend shall not be less than that shown in Table 346-10 of the National Electric Code.

5. Joints:

- i. All joints shall be test mated without forcing. The socket depth of the fitting shall be marked on the outside of the conduit without scratching or damaging the surface. The conduit should enter the fitting for the full depth of the socket depth.
- ii. Before applying cement, the surfaces to be joined shall be wiped clean and free of dirt, oil, grease or moisture. The solvent cement shall be applied to the conduit and fittings quickly, consistent with good workmanship. Under conditions of high humidity, a second full coating of cement shall be applied to the conduit before insertion.
- iii. Immediately after applying the coat of cement to the conduit and fittings, the conduit shall be inserted into the fitting socket until it bottoms at the fitting shoulder. The conduit shall be turned 1/4 turn during insertion to distribute the cement evenly. Excess cement shall be wiped away from the outside of the joint.
- iv. Newly assembled joints shall be handled carefully until the cement has gone through the set period. The recommended set periods are related to temperature as follows:

60 to 100 degrees F:	30 minutes
40 to 60 degrees F:	1 hour
20 to 40 degrees F:	2 hours
0 to 20 degrees F:	4 hours

6. Conduit Encased in Concrete:

- i. Underground concrete-encased conduit shall be supported on plastic spacers specifically designed for the purpose spaced along the length of the run as recommended by the manufacturer. Spacing between raceways within a common duct bank shall be not less than 2 inches. Concrete cover overall shall not be less than 3 inches all around the encased run. Care shall be exercised during concrete placement to assure that there are no voids, so that spacers are undisturbed, and so that conduit joints stay secure and unbroken. When pouring concrete the concrete shall be deflected

or diverted during placement to minimize the possible damage to or movement of the conduits.

- ii. Conduit encased in concrete shall have steel reinforcing where installed below roadway or other paved vehicle areas (including shoulder) and the reinforcement shall extend not less than 5 feet additional from the edge of pavement unless otherwise indicated. Steel reinforcement shall not be less than No. 4 bars at corners and otherwise spaced on 12-inch centers, tied with No. 4 bars on 12-inch centers.

7. Expansion Fittings

- i. Expansion fittings shall be provided for all runs crossing structural expansion joints.
- ii. Expansion fittings, as specified herein, shall be installed in all raceway runs crossing structural expansion joints. Unless otherwise indicated or approved by the Owner's Representative expansion fittings shall include an 8-inch expansion fitting plus a deflection fitting allowing not less than a 3/4-inch deflection in any direction. The drawings shall be examined to determine complete extent of expansion joints.
- iii. Concrete shall be formed around the expansion fittings in a manner to permit their movement as specified.

F. Stainless Steel Junction Boxes

1. Exposed junction boxes on structures shall be installed on 1/2 in. (13 mm) long stainless steel or brass spacers with the hinge on the side of the box and the cover lying in the vertical plane when closed. The exact orientation shall be as shown on the plans or as directed by the Engineer. Care shall be taken to assure proper orientation of mounting lugs.

Field cut conduit openings shall be uniform and smooth. All burrs and rough edges shall be filed smooth prior to the installation of conduit(s) into the junction box. Field cut conduit openings shall be fitted with the appropriate conduit fittings and accessories.

3.03 PAINTING

(Not applicable in this Section).

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for ELECTRICAL CONDUIT.

--- END OF SECTION ---

SERVICE AND DISTRIBUTION SECTION 26 20 00

PART 1 – GENERAL

1.01 SCOPE

This Section covers the requirements for the disconnection, revising, relocating and reconnecting of a complete working installation of the electrical service and distribution system as outlined in Section 26 05 00, specified in detail in other parts of this Section, other related Sections and/or as shown on the Drawings. The Contractor shall coordinate the requirements of the various parts of this Section of the Specifications with the Drawings when ordering materials or performing Work in conformance with the applicable provisions of this Section.

1.02 RELATED WORK

- A. Section 26 05 00: Electrical Work - General

PART 2 – PRODUCTS

2.01 ELECTRICAL SERVICES

The Commonwealth Edison Company will furnish, install and energize a new 277/480V, three (3) phase, four (4) wire, 60 Hertz service at the location shown in the plans. The Contractor's responsibility shall be to provide and install the materials identified in Section 26 05 00 to facilitate the new service. Upon switchover to the new service, the existing service shall be disconnected by ComEd and removed and disposed of by the Contractor. Removal shall include existing cables, meter enclosure, disconnect switch, conduit, wood pole and all other appurtenances. ComEd may also provide services to relocate existing primary distribution cables.

PART 3 - EXECUTION

3.01 GENERAL

- A. The methods of installation of Contractor furnished equipment and materials are described in related Sections of these Specifications and as shown on the Drawings, and shall be in accordance with the manufacturer and/or Commonwealth Edison standard procedures and recognized engineering practices.
- B. The intent of these Specifications is to provide underground electrical service for the pumping facility. The underground electrical service shall be installed in accordance with Commonwealth Edison requirements.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum prices for:

1. ELECTRIC SERVICE AND DISTRIBUTION

2. ELECTRIC SERVICE UTILITY FEE

- a. Includes an allowance of \$30,000 for the cost of work by Commonwealth Edison Company to provide the electrical service disconnect and reconnect and any other unforeseen expenses related to utility relocation. The final contract amount will be adjusted up or down in direct relation to the complete and final billing from Commonwealth Edison Company for their work. At the discretion of the Owner, this fee may be paid directly to the utility company by the Owner in which case the Allowance shall be rebated to the Owner.

--- END OF SECTION ---

**WIRING DEVICES AND LIGHTING FIXTURES
SECTION 26 27 26**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. This section specifies the furnishing, installation and connection of wiring devices and lighting fixtures.

1.02 RELATED WORK:

- A. Section 26 05 00: Electrical Work – General
- B. Section 26 05 16: Electrical Wires and Cables
- C. Section 26 05 26: Grounding
- D. Section 26 05 33: Electrical Conduit
- E. Section 33 09 30: Wastewater Pumping Control System

PART 2 - PRODUCTS

2.01 RECEPTACLES:

- A. General: All receptacles shall be listed by Underwriters Laboratories, Inc.
 - 1. Mounting straps shall be plated steel, with break-off plaster ears and shall include a self-grounding feature (this feature does not substitute for a grounding conductor terminated on grounding strap of device). Terminal screws shall be brass, brass plated or a copper alloy metal.
 - 2. Receptacles shall be of a screw terminal type, “pressure type quick wire” terminations are not allowed.
- B. Duplex receptacles shall be single phase, 20 ampere, 120 volts, 2-pole, 3-wire, and conform to the NEMA 5-20R configuration in NEMA WD 6. The duplex type shall have bussing break-off feature for two-circuit operation. The ungrounded pole of each receptacle shall be provided with a separate terminal.
 - 1. Bodies shall be gray in color or as directed by Owner.
 - 2. Ground Fault Interrupter Duplex Receptacles: Shall be an integral unit suitable for mounting in a standard outlet box.

- a. Ground fault interrupter shall be commercial grade and consist of a differential current transformer, solid state sensing circuitry and a circuit interrupter switch. It shall be rated for operation on a 60 Hz, 120 volt, 20-ampere branch circuit. Device shall meet NEC requirements. Device shall have a minimum nominal tripping time of 1/30th of a second. Devices shall meet UL 943.

C. Weatherproof Receptacles: Shall consist of a duplex receptacle, mounted in box with a gasketed, weatherproof, cast metal cover plate and cap over each receptacle opening. The cap shall be permanently attached to the cover plate by a spring-hinged flap. The weatherproof integrity shall not be affected when heavy duty specification or plug caps are inserted. Cover plates on outlet boxes mounted flush in the wall shall be gasketed to the wall in a watertight manner.

2.02 TOGGLE SWITCHES

- A. Toggle switches shall be totally enclosed tumbler type with bodies of phenolic compound. Toggle handles shall be gray in color or as directed by Owner.
 1. Switches installed in hazardous areas shall be explosion proof type in accordance with the NEC and as shown on the drawings.
 2. Shall be single unit toggle, butt contact, quiet AC type, heavy-duty general-purpose use with an integral self grounding mounting strap with break-off plaster ears and be of a screw terminal type.
 3. Shall be color coded for current rating, listed by Underwriters Laboratories, Inc., and meet the requirements of NEMA WD 1, Heavy-Duty and UL 20.
 4. Ratings:
 - a. 120 volt circuits: 20 amperes at 120-277 volts AC.
 5. The switches shall be mounted on the strike plate side of doors or as shown on plans.
 6. Incorporate barriers between switches with multi-gang outlet boxes where required by the NEC.
 7. All toggle switches shall be of the same manufacturer.

2.03 WALL PLATES:

- A. Wall plates for switches and receptacles shall be type 302 stainless steel or as directed by Owner.
- B. Standard NEMA design, so that products of different manufacturers will be interchangeable. Dimensions for openings in wall plates shall be accordance with NEMA WD1.
- C. For receptacles or switches mounted adjacent to each other, wall plates shall be common for each group of receptacles or switches.
- D. Wall plates for data, telephone or other communication outlets shall be as specified in the associated specification.
- E. Surface mounted boxes, NEMA1, shall be industrial grade raised galvanized steel covers. In shop areas all receptacles shall be dust proof and or waterproof where applicable.
- F. Waterproof device covers shall be cast iron, 4-corner screw type, for FS and FD type mounting. Device covers shall be zinc galvanized finish. Weatherproof covers shall be lockable.

2.03 LIGHT FIXTURES

- A. Valve vault light fixture shall be of LED type, classified for hazardous locations.
- B. The LED unit shall be corrosion-resistant.
- C. The fixture shall be an enclosed and gasketed type designed to exclude dirt, moisture and corrosive vapors from the interior of the luminaires and conduit system. A fluted globe and guard assembly shall be designed for installation or removal as a unit for ease of relamping.
- D. The finish shall be epoxy powder coated bodies and guards.
- E. The LED lighting engine and driver shall be high output LEDs, 45 watts, 50k hours to 70% initial lumens, 5000K color temperature, CRI 69 or greater, power factor greater than 0.90, THD <20% at full load, FCC 47CFR Part 15 Class B Compliant, thermal range 40°C to 55°C.
- F. Input voltage shall be 120 V.
- G. Fixture shall be ceiling or wall mounted with cast junction box and globe guard.
- H. Manufacturer shall be Hubbell HLEML series, or approved equal.

PART 3 - EXECUTION

3.01 WIRING DEVICES INSTALLATION

- A. Ground terminal of each receptacle shall be bonded to the outlet box with an approved green bonding jumper, and also connected to the green equipment grounding conductor.
- B. General: Devices shall be of the type specified herein. All devices shall be installed with “pigtailed” leads from the outlet box. No device shall be used in the “feed through” application. Screw terminals shall be used to connect all devices to the circuit and shall be grounded by means of a ground wire where grounding terminals are provided in the device.
- C. Installation: Devices and plates shall be installed in a “plumb” condition and must be flush with the finish surface of the wall where boxes are recessed.
- D. Mounting heights: All control and convenience devices shall be mounted between 36 and 48 inches above finish floor; mounting heights indicated on plans shall have precedence.

3.01 LIGHTING FIXTURES INSTALLATION

- A. Installation shall be in accordance with the NEC and as shown as on the drawings.
- B. Plan and layout work to avoid interferences with other Contract work. If unavoidable conflict, notify the Owners Representative.
- C. Conduit and wire from the fixtures, switches, and receptacles to the lighting panel shall be in accordance with the NEC.
- D. Connect fixture to junction box using conduit with a temperature rating equal to that of the fixture.
- E. Remove labels and marks, except the UL label, from exposed parts of the fixtures.
- F. Clean fixtures.
- G. Align and direct fixture to illuminate entire valve vault floor.
- H. Directly and rigidly mount on support structures.
- I. Unless otherwise noted, do not use fixtures to support conduit system.
- A. Treat weld area with rust-resistant primer and finish paint where brackets or supports for lighting fixtures are welded to steel members.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the lump sum unit price for ELECTRICAL WIRES AND CABLES.

--- END OF SECTION ---

**ENGINE GENERATOR
SECTION 26 36 20**

PART 1 – GENERAL

1.01 SCOPE

A. Description

This Section covers the engine generator set to be furnished, installed and tested as shown in the Drawings and as specified herein. All related accessories where required, but not specifically provided for in these Specifications, shall be included under this Section of Work.

1.02 RELATED WORK

- A. Section 26 05 00: Electrical Work – General
- B. Section 26 05 16: Electric Wires and Cables
- C. Section 26 05 26: Grounding
- D. Section 26 05 33: Electrical Conduit
- E. Section 26 20 00: Electric Service Installation
- F. Section 26 36 20: Automatic Transfer Switch
- G. Section 33 09 30: Wastewater Pumping Control System

1.03 QUALITY ASSURANCE

- A. The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.

B. Acceptable Manufacturers

ATS is to be supplied by the manufacturer of the existing on-site generator. Acceptable generator manufacturers are:

- 1. Kohler
- 2. Approved Equal

C. Qualifications

- 1. The equipment shall be produced by a manufacturer who is ISO 9001 certified for the design, development, production and service of its complete product line.
- 2. The power system shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains

a service organization available twenty-four hours a day throughout the year.

D. Applicable Standards

The generator set shall conform to the requirements of the following codes and standards:

1. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
2. NFPA 37 (Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines).
3. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
4. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.

1.04 SITE CONDITIONS

A. Ambient Conditions:

1. Engine- generator set shall operate in the following conditions without any damage to the unit or its loads.
 - i. Ambient Temperature: 77 °F
 - ii. Altitude: 689 ft
 - iii. Relative Humidity: 0-95%

1.05 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review drawings, product specifications and descriptions including control schematic diagrams, wiring connection diagrams, complete ratings, short circuit ratings together with certified test performed on similar equipment; installation instructions, operating and maintenance manuals, and field check-out, start-up and testing procedures specified in 01 33 00 for all equipment furnished.

PART 2 - PRODUCT

2.01 MANUFACTURERS

- A. Manufacturers: The basis for this specification is Kohler Power Systems, approved equals may be considered if equipment performance is shown to meet the requirements herein.

2.02 ENGINE-GENERATOR SET

- A. Factory-assembled and tested, diesel engine-generator set, Kohler model 150REOZJF with a 4R13X alternator.

- B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.

- 1. Rigging Information: Indicate location of each lifting attachment, generator-set center of gravity, and total package weight in submittal drawings.

- C. Capacities and Characteristics:

- 1. Power Output Ratings: Electrical output power rating for Standby operation of not less than 187.50 kVA and 150.00 kW when operating at 277/480 volts, 60 Hz, 0.80 power factor. The generator set shall be capable of a 130°C Standby rating while operating in an ambient condition of less than or equal to 77 °F and a maximum elevation of 689 ft above sea level. The standby rating shall be available for the duration of the outage.

- 2. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component. The engine-generator nameplate shall include information of the power output rating of the equipment.

- D. Generator-Set Performance:

- 1. Steady-State Voltage Operational Bandwidth: 1.0 percent of rated output voltage from no load to full load.

- 2. Transient Voltage Performance: Not more than 8 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within 3 seconds. On application of a 100% load step the generator set shall recover to stable voltage within 10 seconds.

- 3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Not more than 4 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within 5 seconds. On application of a 100% load step the generator set shall recover to stable frequency within 10 seconds.
6. Output Waveform: At full load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for any single harmonic. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50.
7. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 8 seconds without damage to generator system components. For a 1-phase, bolted short circuit at system output terminals, system shall regulate both voltage and current to prevent over-voltage conditions on the non-faulted phases.
8. Start Time: Comply with NFPA 110, Level 1, Type 10, system requirements.
9. Ambient Condition Performance: Engine generator shall be designed to allow operation at full rated load in an ambient temperature under site conditions, based on highest ambient condition. Ambient temperature shall be as measured at the air inlet to the engine generator for enclosed units, and at the control of the engine generator for machines installed in equipment rooms.

2.03 ENGINE

A. Fuel: Diesel

B. Rated Engine Speed: 1800RPM.

C. Lubrication System: The following items are mounted on engine or skid:

1. Lube oil pump: shall be positive displacement, mechanical, full pressure pump.

2. Filter and Strainer: Provided by the engine manufacturer of record to provide adequate filtration for the prime mover to be used.
 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- D. Engine Fuel System: The engine fuel system shall be installed in strict compliance to the engine manufacturer's instructions
- E. Governor: Adjustable isochronous, with speed sensing. The governing system dynamic capabilities shall be controlled as a function of engine coolant temperature to provide fast, stable operation at varying engine operating temperature conditions. The control system shall actively control the fuel rate as appropriate to the state of the engine generator. Fuel rate shall be regulated as a function of starting, accelerating to start disconnect speed, accelerating to rated speed, and operating in various isochronous states.
- F. Cooling System: Closed loop, liquid cooled
1. The generator set manufacturer shall provide prototype test data for the specific hardware proposed demonstrating that the machine will operate at rated standby load in an outdoor ambient condition of 40 deg C.
 2. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
 3. Size of Radiator overflow tank: Adequate to contain expansion of total system coolant from cold start to 110 percent load condition.
 4. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gage glass and petcock.
 5. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
 6. Duct Flange: Generator sets installed indoors shall be provided with a flexible radiator duct adapter flange.
- G. Muffler/Silencer: Selected with performance as required to meet sound requirements of the application, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine

manufacturer's engine backpressure requirements. For generator sets with outdoor enclosures the silencer shall be inside the enclosure.

- H. Air-Intake Filter: Engine-mounted air cleaner with replaceable dry-filter element and restriction indicator.
- I. Starting System: 12 or 24V, as recommended by the engine manufacturer; electric, with negative ground.
 - 1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
 - 2. Cranking Cycle: As required by NFPA 110 for level 1 systems.
 - 3. Battery Cable: Size as recommended by engine manufacturer for cable length as required. Include required interconnecting conductors and connection accessories.
 - 4. Battery Compartment: Factory fabricated of metal with acid-resistant finish.
 - 5. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation. The battery charging alternator shall have sufficient capacity to recharge the batteries with all parasitic loads connected within 4 hours after a normal engine starting sequence.
 - 6. Battery Chargers: Unit shall comply with UL 1236, provide fully regulated, constant voltage, current limited, battery charger for each battery bank. It will include the following features:
 - a. Operation: Equalizing-charging rate based on generator set manufacturer's recommendations shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
 - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 20 deg C to plus 40 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
 - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.

- d. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
- e. Provide LED indication of general charger condition, including charging, faults, and modes. Provide a LCD display to indicate charge rate and battery voltage. Charger shall provide relay contacts for fault conditions as required by NFPA110.
- f. Enclosure and Mounting: NEMA, Type 1, wall-mounted cabinet.

2.04 FUEL OIL STORAGE

- A. Comply with NFPA 30.
- B. Sub Base-Mounted Fuel Oil Tank: Provide a double wall secondary containment type sub base fuel storage tank. The tank shall be constructed of corrosion resistant steel and shall be UL 142, UL 2085, CSA listed and labeled. The fuel tank shall include the following features:
 - 1. Capacity: Sized as necessary to provide 24 hours of run time at nominal capacity.
 - 2. Tank rails and lifting eyes shall be rated for the full dry weight of the tank, genset, and enclosure.
 - 3. Electrical stub up(s)
 - 4. Normal & emergency vents
 - 5. Lockable fuel fill
 - 6. Mechanical fuel level gauge
 - 7. High and low level switches to indicate fuel level
 - 8. Leak detector switch
 - 9. Sub base tank shall include a welded steel containment basin, sized at a minimum of 130% of the tank capacity to prevent escape of fuel into the environment in the event of a tank rupture.
 - 10. Fill port with overfill prevention valve (OFPV)

11.5 gallon fill/spill dam or bucket

12. Tank design shall meet the regional requirements for the Project location

2.04 CONTROL AND MONITORING

- C. Engine generator control shall be microprocessor based and provide automatic starting, monitoring, protection and control functions for the unit.
- D. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. (Switches with different configurations but equal functions are acceptable.) When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.
- E. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of the local (generator set-mounted) and/or remote emergency-stop switch also shuts down generator set.
- F. Configuration: Operating and safety indications, protective devices, system controls, engine gages and associated equipment shall be grouped in a common control and monitoring panel. Mounting method shall isolate the control panel from generator-set vibration. AC output power circuit breakers and other output power equipment shall not be mounted in the control enclosure.
- G. Indicating and Protective Devices and Controls: As required by NFPA 110 for Level 1 system, and the following:
 - 1. AC voltmeter (3-phase, line to line and line to neutral values).
 - 2. AC ammeter (3-phases).
 - 3. AC frequency meter.

4. AC kVA output (total and for each phase). Display shall indicate power flow direction.
5. Ammeter-voltmeter displays shall simultaneously display conditions for all three phases.
6. Emergency Stop Switch: Switch shall be a red “mushroom head” pushbutton device complete with lock-out/tag-out provisions. Depressing switch shall cause the generator set to immediately stop the generator set and prevent it from operating.
7. Fault Reset Switch: Supply a dedicated control switch to reset/clear fault conditions.
8. DC voltmeter (alternator battery charging).
9. Engine-coolant temperature gage.
10. Engine lubricating-oil pressure gage.
11. Running-time meter.
12. Generator-voltage and frequency digital raise/lower switches. Rheostats for these functions are not acceptable. The control shall adjustment of these parameters in a range of plus or minus 5% of the voltage and frequency operating set point (not nominal voltage and frequency values.)
13. AC Protective Equipment: The control system shall include over/under voltage, over current, short circuit, loss of voltage reference, and over excitation shut down protection. There shall be an overload warning, and overcurrent warning alarm.
14. Status LED indicating lamps to indicate remote start signal present at the control, existing alarm condition, not in auto, and generator set running.
15. A graphical display panel with appropriate navigation devices shall be provided to view all information noted above, as well as all engine status and alarm/shutdown conditions (including those from an integrated engine emission control system). The display shall also include integrated provisions for adjustment of the gain and stability settings for the governing and voltage regulation systems.
16. Panel lighting system to allow viewing and operation of the control when the generator room or enclosure is not lighted.

17. DC control Power Monitoring: The control system shall continuously monitor DC power supply to the control, and annunciate low or high voltage conditions. It shall also provide an alarm indicating imminent failure of the battery bank based on degraded voltage recover on loading (engine cranking).
- H. Remote Emergency-Stop Switch: Flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.
- I. Common Remote Audible Alarm: Comply with NFPA 110 requirements for Level 1 systems. Include necessary contacts and terminals in control and monitoring panel.
1. Overcrank shutdown.
 2. Coolant low-temperature alarm.
 3. Control switch not in auto position.
 4. Battery-charger malfunction alarm.
 5. Battery low-voltage alarm.
- J. Remote Alarm Annunciator: Comply with NFPA 110. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition.

2.05 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H
- D. Temperature Rise: 125 / Class H environment.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, over speed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.

- G. Enclosure: Drip-proof.
- H. Voltage Regulator: SCR type, Separate from exciter, providing performance as specified. The voltage regulation system shall be microprocessor-controlled, full wave rectified, and provide a pulse-width modulated signal to the exciter. No exceptions or deviations to these requirements will be permitted.
- I. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.
- J. Subtransient Reactance: 15 percent maximum, based on the rating of the engine generator set.

2.06 OUTDOOR GENERATOR-SET ENCLOSURE

- A. Description: Weather Steel housing. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Instruments, control, and battery system shall be mounted within enclosure.
- B. Construction:
 - 1. Hinged Doors: With padlocking provisions. Restraint/Hold back hardware to prevent door to keep door open at 180 degrees during maintenance. Rain lips over all doors.
 - 2. Exhaust System:
 - a. Muffler Location: Within enclosure.
 - 3. Hardware: All hardware and hinges shall be stainless steel.
 - 4. Mounting Base: Suitable for mounting on sub-base fuel tank.
 - 5. A weather protective enclosure shall be provided which allows the generator set to operate at full rated load with a static pressure drop equal to or less than 0.5 inches of water.
- C. Engine Cooling Airflow through Enclosure: Housing shall provide ample airflow for engine generator operation at rated load in an ambient temperature of 40 deg C.
 - 1. Louvers: Fixed-engine, cooling-air inlet and discharge.
- D. Sound Performance: Reduce the sound level of the engine generator while operating at full rated load to a maximum of 72 dBA measured at any location 23 ft from the engine generator in a free field environment.

E. Site Provisions:

1. Lifting: Complete assembly of engine generator, enclosure, and sub base fuel tank (when used) shall be designed to be lifted into place as a single unit, using spreader bars.

2.07 VIBRATION ISOLATION DEVICES

- A. Vibration Isolation: Generators installed on grade shall be provided with elastomeric isolator pads integral to the generator, unless the engine manufacturer requires use of spring isolation.

2.08 FINISHES

- A. Components: Powder-coated and baked over corrosion-resistant pretreatment and compatible primer. Manufacturer's standard color or as directed on the drawings.

PART 3 - EXECUTION

3.01 FACTORY TEST AND INSPECTION

- A. Each item of equipment shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Monitor and control devices shall be functionally tested to verify correct operation and that all parts function properly.

3.02 INSTALLATION AND TESTING

- A. The Contractor shall install the equipment as shown on the Drawings in accordance with the manufacturer's recommendations. The Contractor shall adjust and calibrate the equipment after all connections are made.
- B. All equipment and components shall be tested by operating them a reasonable number of times to demonstrate their proper and safe installation and operation. To determine what constitutes a safe and proper installation, these Specifications, manufacturer's recommendations, guidelines set by NEC, IEEE, ANSI, OSHA, etc. shall be the norm.
- C. Operational tests shall be performed to verify correctness of operation, connections, and interconnections with other equipment.
- D. After the equipment has been made ready for operation, the Contractor shall perform field test of the engine generator. The Contractor shall furnish the services

of a factory representative who shall provide final checkout of the entire installation covered by these Contract Documents and supervise the initial start-up and test of the engine generator. The tests shall include load, phase sequence, and utility power tests. Field testing shall include a simulated power failure and load transfer.

- E. The loads shall be operated continuously for a period of not less than 30 minutes or as otherwise mutually agreed upon between Owner, Owner's Representative and Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for DIESEL ENGINE GENERATOR.

--- END OF SECTION ---

**AUTOMATIC TRANSFER SWITCH
SECTION 26 36 23**

PART 1 – GENERAL

1.01 SCOPE

A. Description

This Section covers the automatic transfer switches (ATS) to be furnished, installed and tested as shown in the Drawings and as specified herein. All related accessories where required, but not specifically provided for in these Specifications, shall be included under this Section of Work.

1.02 RELATED WORK

- A. Section 26 05 00: Electrical Work – General
- B. Section 26 05 16: Electric Wires and Cables
- C. Section 26 05 26: Grounding
- D. Section 26 05 33: Electrical Conduit
- E. Section 26 20 00: Service and Distribution
- F. Section 33 09 30: Wastewater Pumping Control System

1.03 QUALITY ASSURANCE

A. Acceptable Manufacturers

ATS is to be supplied by the manufacturer of the existing on-site generator. Acceptable generator manufacturers are:

- 1. Kohler
- 2. Approved Equal

B. Applicable Standards

All Work shall conform to the applicable provision of the codes, standards and Specifications, as specified herein and the following:

Name	Abbreviation
National Electrical Code	NEC
National Electrical Manufacturers Assoc.	NEMA
Underwriters Laboratories	UL

1.04 SUBMITTALS

The Contractor shall submit to the Owner's Representative for review drawings, product specifications and descriptions including control schematic diagrams, wiring connection diagrams, complete ratings, short circuit ratings together with certified test performed on similar equipment; installation instructions, operating and maintenance manuals, and field check-out, start-up and testing procedures specified in 01 33 00 for all equipment furnished.

PART 2 - PRODUCT

2.01 GENERAL

- A. The automatic transfer switch shall be furnished complete with all necessary sensing relays for each phase of the normal power sources and the standby power source plus all necessary control relays and contacts to transfer the load from the normal power source to the emergency standby power source. Sensing and control logic shall be solid state and mounted on plug-in printed circuit boards. Printed circuit boards shall be keyed to prevent incorrect installation. Interfacing relays shall be industrial control grade plug in type with dust covers. The ATS shall be provided with normal and emergency switch position contacts for use in signaling "normal" or "emergency" status.
- B. The automatic transfer switch shall be listed by Underwriters Laboratory, Standard 1008.
- C. The ATS shall be of open construction, suitable for mounting by the Wastewater Pumping Control System supplier in the Wastewater Pumping Control System specified in Section 33 09 30 and as shown on the Drawings.

2.02 RATING AND OPERATION

The automatic transfer switch designated ATS shall be rated for normal and emergency sources and shall have full 600V insulation on all main contacts and current carrying parts. The automatic transfer switch shall be a 4-pole, 4-wire type with overlapping neutral and shall be rated 200A continuous current for use on a 277/480V, 60Hz system, and shall be capable of withstanding 22,000 A, interrupting/fault close RMS, symmetrical three phase short circuit current for 3 cycles without contact damage or contact separation.

2.03 DETAILS OF CONSTRUCTION

A. Construction

Automatic transfer switch shall be 4-pole, 4-wire unit with overlapping neutral. Normal and emergency contacts shall be mechanically interlocked by the operating linkage when in the open or closed position. All parts of the mechanical

driving system and mechanical interlocks shall be electrically isolated and at ground potential.

B. Load Transfer

There shall be three normal line voltage sensing relays and sequencing controls such that a loss of power in the normal incoming power line below 75% of rated voltage, loss of phase, or voltage imbalance condition of the normal feed will initiate change over to the alternative (secondary) power source, after an adjustable time delay to ignore momentary outages. Upon proper voltage level from the alternative (secondary) power source, the load shall be transferred to the secondary power source. Upon restoration of normal voltage on the utility incoming power line, the transfer panel, after an adjustable time delay, shall transfer load back to Normal Line.

C. Current Carrying Contacts, Coils and Relays

Current carrying contacts, coils and relays shall be readily accessible from the front for maintenance and inspection as individual units. Replacement of any part shall not require removal of the switch panel from the enclosure, or disconnecting the operating linkage or power conductors.

D. Indicating Lights

Indicating lights shall be identified with nameplates mounted on the front of the cabinet door.

E. Test Switch

Test switch shall be provided to simulate normal power failure.

F. Inphase Monitoring

Bidirectional Inphase Transfer System to control transfer operation between live sources. Shall provide variable transfer initiation which limits motor inrush current to magnitude or normal starting current ignoring unequal source voltages and wave shape distortion from solid state controlled loads. Operation shall be over a frequency difference range of +/-2.0 Hz. If voltage of the source carrying load drops below 70%, the inphase function shall be automatically bypassed.

G. Accessories

Accessories shall be provided as follows:

1. Mounted green and red pilot lights for indicating switch in normal and emergency positions, including fuses and auxiliary contacts, rated 10 amps 250 VAC.
2. Individually mounted amber pilot lights for indicating when normal and emergency source voltages are available, including fuses and auxiliary contacts.
3. One normally open auxiliary contact which closes when an abnormal condition is detected on the normal source feed and/or the normal source is de-energized.
4. Ground Bus.
5. Two position test switch. Maintained contact for auto and momentary contact for test.
6. Adjustable close differential relays.
7. Adjustable time delay to emergency to delay transfer to emergency for 0-5 minutes.
8. Adjustable time delay on restoration to delay retransfer to normal for 0-30 minutes.
9. Adjustable time delay to override momentary normal source outages to delay all transfer switch signals for 0.5 to 10 seconds.
10. Normally open auxiliary contact for initiating change over to alternative (secondary) power source. Contact shall close upon loss of normal power. The contact shall remain closed until such time as normal power is restored and the automatic transfer switch has transferred back to the normal position.
11. Terminal boards for control wiring connection.
12. Exercise timer with minimum 30 minutes (adjustable) once per week.

PART 3 - EXECUTION

3.01 FACTORY TEST AND INSPECTION

Each item of equipment shall be shop-assembled and tested in accordance with the manufacturer's standard procedure. Monitor and control devices shall be functionally tested to verify correct operation and that all parts function properly.

3.02 INSTALLATION AND TESTING

- A. The Contractor shall install the equipment as shown on the Drawings in accordance with the manufacturer's recommendations. The Contractor shall adjust and calibrate the equipment after all connections are made.
- B. All equipment and components shall be tested by operating them a reasonable number of times to demonstrate their proper and safe installation and operation. To determine what constitutes a safe and proper installation, these Specifications, manufacturer's recommendations, guidelines set by NEC, IEEE, ANSI, OSHA, etc. shall be the norm.
- C. Operational tests shall be performed to verify correctness of operation, connections, and interconnections with other equipment.
- D. After the equipment has been made ready for operation, the Contractor shall perform field test on the automatic transfer switch. The Contractor shall furnish the services of a factory representative who shall provide final checkout of the entire installation covered by these Contract Documents and supervise the initial start-up and test of the automatic transfer switch. The tests shall include load, phase sequence, and utility power tests. Field testing shall include a simulated power failure and load transfer.
- E. The loads shall be operated continuously for a period of not less than 30 minutes or as otherwise mutually agreed upon between Owner, Owner's Representative and Contractor.

3.03 PAINTING

- A. All equipment specified in this Section shall be shop-painted with the manufacturer's standard finish. All equipment specified in this Section shall be field-painted as directed by the Owner.
- B. The Contractor shall be responsible for coordination of the compatibility between the manufacturer's standard finish and the field-paint specified.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Work specified in this Section will not be paid for as a separate item, but shall be considered as included in lump sum unit price for WASTEWATER PUMPING CONTROL SYSTEM in Section 33 09 30.

--- END OF SECTION ---

EARTH EXCAVATION, BACKFILL, FILL AND GRADING SECTION 31 23 16

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Perform the following earth excavation, backfill, fill and grading as indicated or specified:
 - 1. Make excavations to accommodate piping, conduits, foundations and other structures.
 - 2. Provide materials for backfilling excavations and constructing embankments and fills as indicated and specified.
 - 3. Construct embankments of compacted materials.
 - 4. Grade surfaces to meet finished grades indicated.
 - 5. Immediately notify the Engineer if suspected hazardous materials are encountered and cease operations in that part of work.
 - 6. Remove boulders within the excavation limits.

1.02 RELATED WORK

- A. Section 01 57 00: Erosion and Sediment Control.
- B. Section 02 01 00: Site Preparation.
- C. Section 03 30 00: Concrete Work

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications:
 - 1. C33: Specification for Concrete Aggregates.
 - 2. C136: Sieve Analysis of Fine and Coarse Aggregates.
 - 3. D421: Practice for Dry Preparation of Soil Samples for Particle Size Analysis and Determination of Soil Constants.
 - 4. D422: Test Method for Particle-Size Analysis of Soils.
 - 5. D1140: Test Method for Amount of Material in Soils Finer than the No. 200 (75 Fm) Sieve.
 - 6. D1556: Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

7. D1557: Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft³ (600 kN-m/m³)).
8. D2167: Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.)).
9. D2922: Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods. (Shallow Depth).
10. D3017: Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
11. D4318: Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
12. D4718: Practice for Correction of Unit Weight and Water Content for Soils Containing Oversized Particles.
13. D4944: Test Method for Field Determination of Water (Moisture) Content of Soil by the Calcium Carbide Pressure Tester Method.
14. D4959: Test Method for Field Determination of Water (Moisture) Content of Soil by Direct Heating Method.
15. Test Method for Rapid Determination of Percent Compaction.

- B. Occupational Safety and Health Administration (OSHA) Standards and Regulations contained in Title 29: Subpart P - Excavations, Trenching and Shoring.

1.04 DEFINITIONS

- A. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D1556 to the maximum dry density determined by ASTM D1557 Procedure C, multiplied by 100.
- B. Proof Roll: Compaction with a minimum of 4 passes of a vibratory steel drum or rubber tire roller. Vibratory plate compactors shall be used in small areas where vibratory steel drum or rubber tire roller cannot be used.
- C. Acceptable Material: Material which does not contain organic silt or organic clay, peat, vegetation, wood or roots, stones or rock fragments over 6-inch [15 cm] in diameter, porous biodegradable matter, loose or soft fill, excavated pavement, construction debris, or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material.
- D. Unacceptable Materials: Materials does not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.

1.05 SUBMITTALS

- A. Submit the following in accordance with Section 01 33 00 - Submittals:

1. Qualifications of the Contractor's Independent Testing Laboratory as specified in Paragraph 1.06 I, four (4) weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.
2. Submit an excavation, backfilling, and filling plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
 - a. Detailed sequence of work.
 - b. General description of construction methods.
 - c. Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
 - d. Details of dust control measures.
 - e. Proposed locations of stockpiled excavation and/or backfill materials.
 - f. Proposed surplus excavated material off-site disposal areas and required permits.
 - g. Details of erosion and sedimentation control measures which will prevent erosion and sedimentation during the earth moving activities.
3. Laboratory testing results of gradation and moisture-density relationship. Submittal shall include specific location of the source and the date when sample was taken.
4. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations.

1.06 QUALITY ASSURANCE AND CONTROL

- A. Provide in accordance with Section 01 43 00 and as specified.
- B. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- C. Do not excavate, construct embankments, or fill until all the required submittals have been reviewed by the Engineer.

D. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partially and completed structures, pipelines and embankments or existing structures and pipelines.

E. Field Testing and Inspections:

1. By Contractor's independent testing laboratory, acceptable to the Engineer, at Contractor's expense as specified in Paragraph 1.06 G.
2. Location of tests mutually acceptable to testing laboratory and the Engineer or as directed by the Engineer.
3. In the event compacted material does not meet specified in-place density, re-compact material and retest this area until specified results are obtained at no additional to the Owner.
4. Contractor's testing laboratory to perform inspection at least once daily to confirm lift thickness and compaction effort for entire fill area.
5. Owner will retain the services of an independent testing laboratory to conduct confirmatory testing and inspection.

F. Methods of Field Testing:

1. In-Place Density: ASTM D1556, ASTM D2167, or ASTM D2922.
2. In-Place Moisture Content: ASTM D3017, ASTM D4944, or ASTM D4959.

G. Material Testing Frequency: The following testing frequencies are minimum required or all structural and non-structural fill, grading and embankment.

1. Field In-Place Density and Moisture Content - Aggregate shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than one test per:
 - a. Trenches under structures foundation preparation or roadways subbase: Every 1000 lin. ft. [300 m.] per lift.
 - b. Trenches in areas without structures or roadways: Every 1000 lin. ft. [300 m.] per alternate lift.
 - c. Paved Roadways: Every 200 lin. ft. [60 m.] per lift.
 - d. Paved Areas: 3,500 sq. ft. [350 sq. m.] per lift.

- e. Under Structure: 1,000 sq. ft. [100 sq. m.] per lift.
 - f. Around Structures: 1,500 sq. ft. [150 sq. m.] per lift.
 - h. Embankment Fills: 10,000 sq. ft. [1000 sq. m.] per lift.
2. Moisture Density - One per source, except for aggregate. Repeat the moisture density test for every 5,000 cubic yard of material use, and whenever visual inspection indicates a change in material gradation as determined by the Engineer.
 3. Gradation Analysis - A minimum of one per source and for each moisture density test and whenever visual inspection indicates a change in material gradation.
 4. Owner's testing laboratory to conduct confirmatory testing at a minimum frequency of 25% of the specified frequencies in paragraph 1.06.H, or as directed by Owner's Engineer.

H. Construction Tolerances:

1. Construct finished surfaces to plus or minus 1 inch [2.5 cm] of the elevations indicated.
 2. Grade cut and fill areas to plus or minus 0.20 foot [6.0 cm] of the grades indicated.
 3. Complete embankment edges to plus or minus 6 inches [15 cm] of the slope lines indicated.
 4. Provide the Engineer with adequate survey information to verify compliance with above tolerances.
- I. Cut pavement with a saw or pneumatic tools to prevent damage to remaining pavement without extra compensation. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.
- J. Pipes, drains, and other utilities may exist in certain locations not indicated on drawings. No attempt has been made to show all services. Completeness or accuracy of information given is not guaranteed.
- K. Dig test pits considered as incidental to the normal excavation as indicated and specified in this Section, at no additional compensation.

- L. Carefully support and protect from damage, existing pipes, poles, wires, fences, curbs, property line markers, and other structures, which the Engineer determines must be preserved in place without being temporarily or permanently relocated. Should such items be damaged, restore without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.
- M. Whenever certain existing structures, as described below, are encountered, and the Engineer so directs, change the location, remove and later restore, or replace such structures, or assist the Owner in doing so.
- N. In removing existing pipes or other structures, include for payment only those new materials which are necessary to replace those unavoidably damaged as determined by the Engineer.
- O. The preceding two paragraphs apply to pipes, wires, and other structures which meet the following: (a) are not indicated on the drawings or otherwise provided for, (b) encroach upon or are encountered near and substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer, will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.
- P. Restore existing property or structures as promptly as practicable.
- Q. If material unacceptable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, remove such material to the required width and depth as directed by the Engineer and replace it with aggregate, select borrow, or concrete.
- R. Do not remove excavation materials from the site of the work or dispose of except as directed or permitted by the Engineer.
- S. Haul away and dispose of surplus excavated materials at locations directed by the Engineer at no additional cost to the Owner.
- T. During progress of work, conduct earth moving operations and maintain work site so as to minimize the creation and dispersion of dust. Furnish and spread calcium chloride if the Engineer decides that it is necessary for more effective dust control.
- U. Provide suitable and safe bridges and other crossings where required for accommodation of travel, and to provide access to private property during construction, and remove said structures thereafter.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Use only acceptable materials from excavations or borrows.
- B. Provide 1,500 psi [10 MPa] concrete.
- C. Aggregate Base Course: CA-6 per SSRBC, Section 1004.
- D. Bridging Base Course: CA-1 per SSRBC Section 1001.
- E. Geotextile Fabric: Woven or nonwoven filaments of polypropylene, polyester, or polyethylene per SSRBC Section 1080.02.

2.02 EQUIPMENT

- A. The compaction equipment shall be selected by the Contractor, and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:
 - 1. Manually operated vibratory plate compactors weighing no less than 200 pounds [90 kg] with vibration frequency no less than 1600 cycles per minute.
 - 2. Vibratory steel drum or rubber tire roller weighing at least 12,000 pounds [5450 kg].

PART 3 – EXECUTION

3.01 SITE MAINTENANCE

- A. Site Leveling: Grade site as to maintain it in a level unrutted condition and to eliminate puddling of surface and subsurface water.

3.02 EXCAVATION

- A. Execution of any earth excavation shall not commence until the related excavation support systems, and backfill and fill materials submittals are reviewed by the Engineer and all Engineer's comments satisfactorily addressed.
- B. Carry out program of excavation, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or of work previously completed under this contract.

- C. Excavate to widths that give suitable room for building structures or laying and jointing piping.
- D. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.
- E. Excavate to lines and grades indicated in an orderly and continuous program.
- F. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.
- G. Excavate to elevations indicated, or deeper, as directed by the Engineer, to remove unacceptable bottom material.
- H. Exercise care to preserve material below and beyond the lines of excavations.
- I. Place excavated material at the approved stockpile locations and in no case closer than 3 feet [90 cm] from edge of excavations to prevent cave-ins of bank slides.
- J. Regard small, less than one cubic yard, boulders, rock fragments, and concrete encountered during excavation as a normal part of in-place soils and not included for payment as rock.

3.03 SEPARATION OF EXCAVATED MATERIALS FOR REUSE:

- A. Remove only existing pavement that is necessary for prosecution of work.
- B. Carefully remove loam and topsoil from excavated areas. Store separately for further use or furnish equivalent loam and topsoil as directed.
- C. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material.

3.04 TRENCH EXCAVATION

- A. When pipe is to be laid in gravel bedding or concrete cradle, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.
- B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated just before placing of pipe by use of hand tools. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.

3.05 DEPTH OF TRENCH

- A. Excavate trenches to depths so as to permit pipe to be laid at elevations, slopes, or depths of cover indicated on drawings, and at uniform slopes between indicated elevations.

3.06 WIDTH OF TRENCH

- A. Make pipe trenches as narrow as practicable and do not widen by scraping or loosening materials from the sides. Make every effort to maintain sides of trenches firm and undisturbed until backfilling has been placed and compacted.
- B. Excavate trenches with approximately vertical sides between springline of pipe and elevation 1 ft. [30 cm] above top of pipe.

3.07 TRENCH EXCAVATION IN FILL

- A. Place and compact material to top of fill or to a minimum height of 1 ft. [30 cm] above top of pipe, whichever is less, when pipe is to be laid in embankment or other recently filled material. Take particular care to ensure maximum consolidation of material under pipe location. Excavate pipe trench as though in undisturbed material.

3.08 EXCAVATION NEAR EXISTING STRUCTURES

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly.

3.09 REMOVAL OF SUBSURFACE OBSTRUCTIONS

- A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.
- B. Excavate test pits when determination of exact location of pipe or other underground structure is necessary for doing work properly.

3.10 UNAUTHORIZED EXCAVATION

- A. When the bottom of any excavation for structures is taken out beyond limits indicated or specified, backfill, with Aggregate Base Course compacted to 95% maximum dry density.

3.11 REUSE AND DISPOSAL OF SURPLUS EXCAVATED MATERIALS

- A. Reuse surplus acceptable excavated materials for backfill; deposit neatly and grade so as to make or widen fills, flatten side slopes, or fill depressions; or legally dispose off-site; all as directed or permitted and without additional compensation.

3.12 SUBGRADE PREPARATION AND PROTECTION

- A. Remove loam and topsoil, loose vegetative matter, stumps and large roots from areas upon which embankments will be built or material will be placed for grading. Shape subgrade as indicated on drawings, and prepare by forking, furrowing, or plowing so that the first layer of new material placed thereon will be well bonded to it.
- B. As directed by the Engineer, overexcavate unacceptable materials below the foundation subgrade. Backfill the overexcavation with compacted Aggregate Base Course.
- C. Proof roll the foundation subgrade prior to backfilling and filling operation, or placing foundation concrete.
- D. Proof roll the pipe trench foundation subgrade prior to backfilling and filling operation, or placing soil-supported pipeline.
- E. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the pipe trench foundation subgrade to avoid disturbance of the bearing surface. Tamp the exposed subgrade with the excavating bucket prior to backfilling and filling operation, or placing soil-supported pipeline.

3.13 CARE AND RESTORATION OF PROPERTY

- A. Enclose uncut tree trunks adjacent to work in wooden boxes of such height as may be necessary for protection from injury from piled material, equipment, operations, or otherwise due to work. Operate excavating machinery and cranes of suitable type with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. Cut all branches, limbs, and roots smoothly and neatly without splitting or crushing. Neatly trim, cut the injured portions and cover with an application of grafting wax or tree healing paint as directed.

- C. Protect cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations by suitable means or dig up and temporarily replant and maintain. After construction operations have been substantially completed, replant in original positions and care for until growth is reestablished. If cultivated hedges, shrubs, and plants are injured to such a degree as to effect their growth or diminish in their beauty or usefulness, replace by items of equal kind and quality existing at the start of the work.
- D. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces.
- E. Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

3.14 BACKFILLING - GENERAL

- A. Do not place, spread, roll or compact fill material during unfavorable weather conditions. If interrupted by heavy rain or other unfavorable conditions, do not resume until ascertaining that the moisture content and density of the previously placed soil are as specified.
- B. Do not use water jetting or flooding as a means of compaction.

3.15 MATERIAL PLACEMENT AND COMPACTION REQUIREMENTS

A. Select Borrow, and Fine Aggregate:

1. Dump and spread in layers not to exceed 8-in. [20 cm] uncompacted thickness.
2. Compact, fill and backfill under structure and bedding for pipes (from below pipe to spring line) as indicated but to not less than 95 percent. Compact to not less than 90 percent in other areas unless otherwise indicated.

B. Aggregate Base Course:

1. Dump and spread in layers not to exceed 8-in. [20 cm] uncompacted thickness.
2. Compact using self propelled vibratory steel drum or rubber tire rollers with a minimum of 4 passes in directions perpendicular to one another in

open areas. In small areas, use manually operated vibratory plate compactors with a minimum of 4 passes.

3. Compact to 95% maximum dry density.
- C. Bank-run Gravel and Acceptable materials for use as non-structural fill:
1. Dump and spread in layers not to exceed 12-in. [30 cm] uncompacted thickness.
 2. Compact to not less than 90 percent unless otherwise indicated.
- D. Backfilling and filling operation shall be suspended in areas where tests are being made until tests are completed and the testing laboratory has advised the Engineer that adequate densities are obtained.

3.16 STRUCTURAL FILL AND BACKFILL UNDER STRUCTURES

- A. Compact fill and backfill under structures and pavements with Aggregate Base Course.

3.17 NON-STRUCTURAL BACKFILL AROUND STRUCTURES

- A. Use acceptable materials for non-structural backfill around structures and compacted as specified and indicated.
- B. Conduct hydraulic testing as soon as practicable after structures are constructed and other necessary work has been done. Start backfilling promptly after completion of tests.
- C. Deposit material evenly around structure to avoid unequal soil pressure.
- D. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage.

3.18 BACKFILLING PIPE TRENCHES

- A. General:
1. Begin backfilling and proceed until completed after: the pipes and conduits have been laid, joints have acquired maximum degree of hardness, pipelines and conduits have successfully passed tests and inspections as required in the Specifications, and concrete or masonry structures within the trench have reached their design strength to support all loads.

2. Backfill and compact indicated material under, around, and above pipes, conduits, and other structures to the indicated or specified compaction density requirement. Utilize compaction devices which will not damage the pipe, conduit, or structure within the trench.
3. Do not drop backfill material into trench from a height of more than 5 ft. [150 cm], or in a manner which will damage the pipe, conduit, or other structure within trench.

B. Pipe Trenches:

1. Materials:

- a. From below pipe to 1 ft. [30 cm] above top of pipe: Use screened gravel, or crushed stone, unless otherwise indicated.
 - b. One foot [30 cm] above top of pipe to finished grade or to pavement subbase: Use bank-run gravel or acceptable materials, unless otherwise indicated.
2. Compacting Around Pipes: Compact material around circumference of pipe and the area between the trench wall and the pipe by hand tamping in 6 inches [15 cm] layers.
 3. Compacting Above Pipe: Compact material by hand tamping. If trench width is wide enough to accommodate power tools and the compacted material over the pipe will support the load of the power tools without damage to the pipe, use rollers or other powered compaction equipment able to more readily achieve compaction requirements.

3.19 MATERIAL FOR FILLING AND EMBANKMENTS

- A. Use acceptable materials for filling and building embankments unless otherwise indicated.

3.20 PLACING AND COMPACTING EMBANKMENT MATERIAL

- A. Compact fill material as specified and indicated.
- B. Perform fill operation in an orderly and systematic manner using equipment in proper sequence to meet the specified compaction requirements.
- C. Place fill on surfaces which are free of unacceptable materials.

- D. Begin filling in lowest section of work area. Grade surface of fill approximately horizontal but provide with sufficient longitudinal and transverse slope to allow for runoff of surface water from every point.
- E. Conduct filling so that no obstruction to drainage from other sections of fill area is created at any time.
- F. Reduce moisture content of fill material, if necessary, in source area by working it over under warm and dry atmospheric conditions. A large disc harrow with two to three foot diameter disks may be required for working soil in a drying operation.
- G. Compact uniformly throughout. Keep surfaces of fill reasonably smooth and free from humps and hollows which would prevent proper and uniform compaction. Do not permit hauling equipment to follow a single track on the same layer but direct equipment to spread out to prevent overcompaction in localized areas. Take care in obtaining thorough compaction at edges of fill.
- H. Slightly slope surface of fill to ensure drainage during periods of wet weather. Do not place fill while rain is falling or after a rain-storm until the Engineer considers conditions satisfactory. During such periods and upon suspension of filling operations for any period in excess of 12 hours, roll smooth the surface of fill using a smooth wheel static roller to prevent excessive absorption of rainfall and surface moisture. Prior to resuming compaction operations, remove muddy material off surface to expose firm, compacted material, as determined by the Engineer.
- I. When fill is placed against an earlier fill or against in-situ material under and around structures, including around piping beneath structures or embankments, slope junction between two sections of fill, 1 vertical to 1.5 horizontal. Bench edge of existing fill 24- in. [60 cm] to form a serrated edge of compact stable material against which to place the new fill. Ensure that rolling extends over junction between fills.
- J. When fill is placed directly upon another older fill, clean surface thoroughly of debris and remove any loose material. Then proof roll the entire old surface.
- K. After spreading each loose lift to the required thickness and adjusting its moisture content as necessary, roll with sufficient number of passes to obtain the required compaction. One pass is defined as the required number of successive trips which by means of sufficient overlap will insure complete coverage and uniform compaction of an entire lift. Do not make additional passes until previous pass has been completed.
- L. In case material of any fill sinks and weaves under roller or under hauling units and other equipment, required degree of compaction is not being obtained. Reduce the moisture content. If such sinking and weaving produces surface

cracks, suspend operations on that part of the embankment until it becomes sufficiently stabilized. Ideal condition in fill is that attained when the entire fill below the surface being rolled is so firm and hard as to show only the slightest weaving and deflection as roller passes. Spread out rolling operations over the maximum practicable area to minimize condition of sinking and weaving.

- M. If because of defective workmanship, compaction obtained over any area is less than that required, remedy condition at no cost to Owner. If additional rolling or other means fail to produce satisfactory results, remove material in that area down to a level of satisfactory density. Perform removal, replacement, and rerolling without additional compensation.

3.21 COMPACTION CONTROL OF BACKFILL, FILL, AND EMBANKMENT

- A. Compact to density specified and indicated for various types of material. Control moisture content of material being placed as specified or if not specified, at a level slightly lower than optimum.
- B. The soil testing laboratory shall provide inspection during filling or backfilling operations to ensure compaction of aggregate and record compaction equipment in use.
- C. Moisture control may be required either at the stockpile area, pits, or on embankment or backfill. Increase moisture content when material is too dry by sprinkling or other means of wetting uniformly. Reduce moisture content when material is too wet by using ditches, pumps, drainage wells, or other devices and by exposing the greatest possible area to sun and air in conjunction with harrowing, plowing, spreading of material or any other effective methods.

3.22 ALLOWANCE FOR SHRINKAGE

- A. Build embankments or backfill to a height above finished grade which will, in the opinion of the Engineer, allow for the shrinkage or consolidation of material. Initially, provide at all points, an excess of at least one percent of total height of backfill measured from stripped surface to top of finished surface.
- B. Supply specified materials and build up low places as directed, without additional cost if embankment or backfilling settles so as to be below the indicated level for proposed finished surface at any time before final acceptance of the work.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

A. Payment for the Work specified in this Section will be made at the lump sum prices for:

1. EARTHWORK

- a. Includes all work in this section with exception of 4.02.A.2 - 3 below.

2. COMPACTED CA-6 SUBGRADE

- a. Under wet well, traffic box enclosure, generator, and valve vault / meter / bypass vault.
- b. Subgrade for sidewalk construction shall be included in the contract unit pricing for CONCRETE SIDEWALK, 5" as specified in Section 03 30 00.
- c. Subgrade for curb and gutter shall be included in the contract unit pricing for M3.12 CURB AND GUTTER.
- d. Subgrade for concrete apron construction shall be included in the contract unit pricing for CONCRETE APRON, 6" as specified in Section 03 30 00.
- e. Subgrade for asphalt driveway construction shall be included in the contract unit pricing for ASPHALT DRIVEWAY as specified in Section 32 12 16.

3. COMPACTED CA-1 SUBGRADE

- a. Under valve vault / meter / bypass vault.

--- END OF SECTION ---

**DEWATERING
SECTION 31 23 19**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes specifications for temporary dewatering systems.
- B. Refer to Section 02 06 14 – Geotechnical Data Report and the Proposed Lift Station plan and details for soil groundwater elevations.

1.02 SYSTEM DESCRIPTION

- A. Remove water which accumulates in excavations during the progress of work so that all work can be done in the dry, unless otherwise approved by the Engineer. Keep excavated areas free from water while underground utilities or structures are constructed, while concrete is setting and until backfill or elements of the structure have been placed to a sufficient height to anchor the work against possible leakage or buoyant uplift forces. A height to anchor the work against buoyant uplift forces shall be considered sufficient when the dead load weight of the backfill or elements of the structure exceeds the uplift forces by a minimum factor-of-safety of 1.5.
- B. In addition to the other requirements specified herein, design the dewatering systems to perform as follows:
 - 1. Prevent damage to adjacent properties, buildings, structures, utilities, and other work as a result of settlement or other groundwater-related effects.
 - 2. At all times, maintain groundwater levels over the entire excavation a minimum of 2 feet below the excavation grade.
- C. At all times, have on the work site sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable. Dispose of water in accordance with the detailed requirements specified herein and so as to cause no injury to personnel or the public, damage to public or private property, nor menace to the public health.
- D. Design dewatering system to prevent pumping fines from below grade or disturbing materials exposed at the excavation bottom. Wells shall be cased, and filter(s) shall be provided to prevent such pumping of fines.
- E. Provide a sufficient number of monitoring wells to confirm the following:

1. The dewatering system is performing as intended and is achieving the specified reduction in groundwater levels.
 2. Construction site groundwater levels inside and outside dewatered excavations to determine the acceptability of removing the dewatering system from operation.
- F. Furnish container for construction dewatering complete with baffles for the purpose of filtering silt prior to discharge of water. Size container or containers to suit dewatering and storage demands. Alternatively, provide filter bags of sufficient size for dewatering.
- G. If the approved methods include displacing groundwater as concrete or other work is placed in excavations, the dewatering system shall capture groundwater as it is displaced and follow the procedures herein for its containment, analysis, and discharge.
- H. Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering.

1.03 SUBMITTALS

- A. Submit dewatering plan including shop drawings and design data including the following elements:
1. The proposed type of dewatering system.
 2. Arrangement, location, and depths of system components.
 3. Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.
 4. Types and sizes of filters.
 5. Design calculations demonstrating adequacy of the proposed system and equipment.
 6. Methods of disposal of pumped water.
 7. Method of water quality monitoring.
 8. Type of filtration and chemical treatment of contaminated water, as applicable.
 9. Well point system design, if proposed: Submit design complete with calculations and shop drawings.

10. Method for establishing and monitoring construction site groundwater levels.

11. Criteria for determining the acceptability of removing the dewatering system from operation.

B. Prior to removing the dewatering system from operation, submit documentation and calculations verifying that the approved criteria for determining the acceptability of removing the system from operation have been met.

1.04 DELIVERABLES

A. Submit copies of permits required for work of this Section.

1.05 QUALITY ASSURANCE

A. Well point design, if applicable, shall be prepared, signed, and sealed by a geotechnical engineer registered by the State of Illinois and qualified and experienced to perform such design.

PART 3 – EXECUTION

3.01 DEWATERING

A. Except as otherwise indicated in the Contract Documents, perform dewatering to accomplish a lowering of measured static ground water level to an elevation which is suitable for the construction of structures below grade.

B. When pumping is required to reduce groundwater levels, accomplish pumping in a manner that will not disrupt the surrounding environment.

C. The Contractor may, during the daylight hours of 8:30 AM to 4:30 PM, use generators to operate the dewatering pumps. During all other hours, power to run the pumps shall be electric and obtained from the electric power utility in accordance with Section 01 50 00, Construction Facilities, unless otherwise authorized by the Engineer and jurisdictional authorities.

D. If any dewatering well pumps fines, terminate pumping and construct new well at a different location with a revised design which eliminates the pumping of fines.

E. Do not turn off the dewatering system in a manner that the upsurge in water weakens the subgrade for completed excavation and structure foundation work.

F. Remove storage containers, including those cleaned, and other dewatering facilities from the site at the completion of dewatering operations.

3.02 CONTAINMENT, ANALYSIS, AND DISCHARGE OF GROUNDWATER EXTRACTED

- A. Containment: Upon extraction, store groundwater extracted in the process of construction dewatering in containers prior to discharge or disposal of water, as applicable. Keep containers locked to prevent accidental or purposeful discharge of the water. Contain and store the water on-site and in such a manner that it will not interfere with the Contractor's existing or continued construction operations.
- B. Analysis: Collect and analyze water samples taken directly from each storage container to verify that the extracted groundwater meets applicable discharge requirements. Number of samples taken per container shall be at the sole discretion of the Engineer.
- C. Discharge Requirements: Discharge no water which exceeds regulatory requirements or the jurisdictional authority's discharge requirements.
- D. Use: Extracted groundwater of sufficient quality as shown by test data may be used on site with Engineer's written approval for those purposes approved by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

Work specified in this Section will not be measured or paid for as a separate item, but shall be considered as included in the prices bid for the various pay items of work involved.

--- END OF SECTION ---

SHORING, SHEETING, AND BRACING
SECTION 31 41 00

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes: Work required for protection of an excavation or structure through shoring, sheeting, and bracing.

1.02 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Section 01 33 00.
- B. Contractor's Submittals: Submit a Certificate only, signed and sealed by a Licensed Professional Engineer experienced in Structural Engineering and registered in the State of Illinois, that certifies that the Licensed Professional Engineer has evaluated and approved the Contractor's excavation plan and has prepared complete design calculations and working drawings for the shoring, sheeting and bracing, not specifically shown on the Contract Drawings, which will be used for excavation support.

1.03 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. All Federal, State and local laws and regulations applying to the design and construction of shoring, sheeting and bracing.
 - 2. National Bureau of Standards Building Science Series 127 "Recommended Technical Provisions for Construction Practice in Shoring and Sloping Trenches and Excavations."

PART 2 – PRODUCTS

2.01 MANUFACTURERS AND MATERIALS

- A. Use manufacturers and materials for shoring, sheet and bracing as recommended by the Contractor's Licensed Professional Engineer who designed the shoring, sheeting, and bracing. Products shall be subject to the review of the Owner's Representative.
- B. Fabrication of sheeting / shoring / bracing shall be in accordance with applicable requirements of IDOT Standard Specification Article 505.04.

PART 3 – EXECUTION

3.01 SHORING, SHEETING AND BRACING INSTALLATION

- A. General: Provide safe working conditions, prevent shifting of material, prevent damage to structures or other work, and avoid delay to the work, all in accordance with applicable laws and regulations. Properly shore, sheet, and brace all excavations that are not cut back to the proper slope, as determined by the Contractor's Licensed Professional Engineer.
 - 1. Take sole responsibility for the design and adequacy of shoring, sheeting and bracing not shown on the Contract Drawings.
 - 2. Take sole responsibility for the methods of installation of the shoring, sheeting and bracing.
- B. Arrange shoring, sheeting and bracing so as not to place any strain on portions of completed work until the general construction has proceeded far enough to provide ample strength.
- C. If the Contractor or its Licensed Professional Engineer is of the opinion that at any time the Contractor's excavation plan, shoring, sheeting or bracing is inadequate or unsuited for the purpose, take immediate and appropriate action. Provide a new Certificate if the Contractor's excavation plans, shoring, sheeting or bracing require modifications.
- D. Monitoring: Periodically monitor horizontal and vertical deflections of sheeting, shoring and bracing.
- E. Accurately locate all underground utilities and take the required measures necessary to protect them from damage. All underground utilities shall be kept in service at all times as specified in Division 1.
- F. Remove shoring, sheeting and bracing as the excavation is refilled in a manner to avoid the caving in of the bank or disturbance to adjacent areas or structures or pipe bedding.
 - 1. Carefully fill voids left by the withdrawal of the shore, sheeting and bracing. No separate payment will be made for the filling of such voids.
 - 2. If pipe bedding is disturbed, re-compact it to meet specified density requirements.
- G. Permission for Removal: Obtain permission from the Contractor's Licensed Professional Engineer before the removal of any shoring, sheeting or bracing.

Retain the responsibility for injury to structures or to other property or persons for failure to leave such shoring, sheeting and bracing in place even though permission for removal has been obtained.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT:

- A. Payment for the Work specified in this Section will be made at the lump sum prices for TEMPORARY SOIL RETENTION SYSTEMS.

--- END OF SECTION ---

ASPHALT PAVING SECTION 32 12 16

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes: Asphalt paving mix, asphalt materials, aggregate base course, primer preparation, tack coat preparation, and placing asphalt pavement – two courses.

1.2 SUBMITTALS

- A. Product data: Submit product information and mix design
- B. Certification: Provide Manufacturer's Certification Report that products and materials meet or exceed all specified requirements.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Section 1030 of the IDOT Standard Specifications.
- B. Equipment shall conform to Section 1102 of the IDOT Standard Specifications.
- C. Obtain materials from same source throughout.

1.4 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum five years' experience.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not place binder course when temperature in the shade is below 40 degrees F, surface course when temperature in the shade is below 45 degrees F, or any course if surface is wet or frozen.
- B. Install Work in accordance with Section 406 of the IDOT Standard Specifications.
- C. Place bitumen mixture when mixture temperature is not more than 15 degrees F below bitumen supplier's bill of lading and not more than maximum specified temperature.
- D. Contractor shall comply with all local, state, and federal regulations applicable to Work of this Section.
- E. Contractor shall comply with and be solely responsible for compliance with U.S. Department of Labor OSHA Part 1926 Safety and Health Regulations for Construction for this Work.

- F. Contractor performing Work of this Section shall be solely responsible for identifying, furnishing, installing and maintaining equipment and materials required by the state and federal regulations to establish safe working conditions during Work of this Section.

PART 2 PRODUCTS

2.1 ASPHALT PAVING MIX

- A. Use dry material to avoid foaming. Mix uniformly.
- B. Provide Asphaltic Concrete Binder Course, Leveling Binder and Surface Course Mixtures as specified in the plans meeting Section 406 of the IDOT Standard Specifications.
- C. Recycled Asphalt Pavement (RAP) may be used.
 - 1. Contractor may use up to 25 percent RAP for binder course mixtures. When RAP exceeds 20%, PG 58-22 asphalt shall be used.
 - 2. Contractor may use up to 15 percent RAP in surface course mixtures.

2.2 ASPHALT MATERIALS

- A. Primer and Tack Coat in accordance with Section 406 of the IDOT Standard Specifications.

2.3 SOURCE QUALITY CONTROL AND TESTS

- A. Submit proposed mix design for each mixture for review prior to beginning of Work.
- B. Perform Asphaltic Concrete Testing in accordance with Section 406 of the IDOT Standard Specifications.

PART 3 EXECUTION

3.1 TEMPORARY ACCESS

- A. Provide aggregate for temporary access at entrances per 32 11 23 – Aggregate Base Courses. Private entrance minimum width shall be 12 feet with a maximum grade of eight percent. Commercial entrance minimum width shall be 24 feet with a maximum grade shall be six percent.

3.2 EXAMINATION

- A. Division 1: Verification of existing conditions before starting work.
- B. Verify compacted aggregate base is acceptable and ready to support paving and imposed loads.
- C. Verify gradients and elevations of base are correct.

3.3 AGGREGATE BASE COURSE

- A. Section 32 11 23 "Aggregate Base Course" forms base course construction for Work of this section.
- B. Prior to paving, Contractor shall proofroll the prepared aggregate base course as specified under Section 32 11 23. Remedial work required shall be as specified under Section 32 11 23.

3.4 PRIME COAT APPLICATION

- A. Apply prime coat in accordance with Section 406 of the IDOT Standard Specifications.
- B. Apply prime coat on milled surfaces at a uniform rate of 0.05 lb/sf
- C. Use clean sand to blot excess primer.

3.5 TACK COAT APPLICATION

- A. Apply tack coat in accordance with Section 406 of the IDOT Standard Specifications.
- B. Apply tack between asphalt lifts at uniform rate of 0.025 lb/sf
- C. Apply tack coat to contact surfaces of curbs and gutters.
- D. Coat surfaces of utility structure frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.6 PLACING ASPHALT PAVEMENT - TWO COURSE INSTALLATION

- A. Install asphalt pavement in accordance with Section 406 of the IDOT Standard Specifications.
- B. Place asphalt binder course within 24 hours of applying primer
- C. Place binder course to thickness shown on Drawings.
- D. Place surface course within 24 hours of placing and compacting binder course. When binder course is placed more than 24 hours before placing surface course, clean surface and apply tack coat before placing surface course.
- E. Place surface course to thickness shown on Drawings.
- F. Install utility grilles and frames in correct position and elevation prior to installation of pavement.
- G. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

H. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.7 TOLERANCES

A. Flatness: Maximum variation of 3/8-inch measured with 15-foot straight edge.

B. Scheduled Compacted Thickness: Within 1/4-inch.

C. Variation from Indicated Elevation: Within 1/4-inch.

3.8 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 1 and particularly Parts 1.06 and 3.02 of Section 01 40 00. Frequency of tests shall be as determined by Testing Agency and approved by Engineer.

3.9 PROTECTION OF FINISHED WORK

A. Immediately after placement, protect pavement from mechanical injury for 12 hours or until surface temperature is less than 140 degrees F, whichever occurs first.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. HMA DRIVEWAY will be measured for payment in place, and the area computed in square yards.

4.02 PAYMENT:

A. Payment for the Work specified in this Section will be made at the contract unit price per square yard for HMA DRIVEWAY which includes all work in this specification, earthwork, and 9" CA-6 compacted stone base course as shown on the plans.

--- END OF SECTION ---

CONCRETE PAVING

SECTION 32 13 13

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

1. Materials and installation requirements for exterior concrete components as follows:
 - a. Concrete Driveway Apron Pavement.
 - b. Sidewalk.
 - c. Curb and Gutter.

1.2 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in the Standard General Conditions.
- B. Mix Design: For each class of concrete.
- C. Product Data: Data on joint filler, reinforcement, admixtures, and curing and sealing compound, and detectable warning tiles

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Illinois Department of Transportation standards indicated in Check Sheet 24 and 25 of the Supplemental Specifications and Recurring Special Provisions.
- B. Obtain cementitious materials from same source throughout.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F or surface is wet or frozen.

PART 2 PRODUCTS

2.1 FORM MATERIALS

- A. In accordance with Article 1103.05 of the IDOT Standard Specifications.

2.2 REINFORCEMENT

- A. Reinforcing Steel: Epoxy coated finish, Article 1006.10 of the IDOT Standard Specifications.

- B. Dowel Bars: Epoxy coated finish, Article 1006.11 of the IDOT Standard Specifications.
- C. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, and dowels in place shall be in accordance with Article 1006.11 of the IDOT Standard Specifications.

2.3 CONCRETE MATERIALS

- A. In accordance with Section 1020 of the IDOT Standard Specifications.

2.4 CHEMICAL ADMIXTURES

- A. In accordance with Section 1021 of the IDOT Standard Specifications.

2.5 ACCESSORIES

- A. Joint Filler: In accordance with Section 1051 of the IDOT Standard Specifications.
- B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating, intended for use on concrete.

2.6 CURING AND TREATMENT MATERIALS

- A. Water: Potable and clean.
- B. Membrane Curing Compound: Type III in accordance with Article 1022.01 Paragraph (C) of the IDOT Standard Specifications.
- C. Protective Coat: In accordance with Article 1023.01 of the IDOT Standard Specifications.
- D. Hot-Applied Joint Sealants: In accordance with Article 1050.02 of the IDOT Standard Specifications.

2.7 CONCRETE MIX

- A. Use mix proportions for the appropriate Class of concrete as set forth in Section 1020 of the IDOT Standard Specifications.
- B. High-early strength concrete mix shall be used at commercial entrances.
- C. A qualified agency acceptable to Engineer shall prepare mix designs. Submit copies of mix designs for Engineer's review prior to placing any concrete.

- D. Mix design shall indicate brands, types, and quantities of admixtures included, compressive strength, slump, sieve analysis for fine and coarse aggregate, quantities of all ingredients, type and brand of cement, source of aggregate, and whether fine aggregate is natural or manufactured.
- E. Use accelerating admixtures in cold weather only when approved by Engineer in writing. Use of admixtures will not relax cold weather placement requirements.
- F. Use calcium chloride only when approved by Engineer in writing.
- G. Use set retarding admixtures during hot weather only when approved by Engineer in writing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted granular base is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 SUBBASE

- A. Section 32 11 23 Aggregate Base Course, forms base construction for Work in this section.

3.3 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.
- B. Coat surfaces of utility frames with oil to prevent bond with concrete.
- C. Notify Engineer a minimum 24 hours prior to commencing concrete operations.

3.4 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete operations.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement

3.5 PLACING REINFORCEMENT

- A. Place reinforcement as indicated

- B. Interrupt reinforcement at expansion joints.
- C. Place tie bars to achieve pavement and curb alignment as detailed.

3.6 PLACING CONCRETE

- A. Place concrete in accordance with Section 420, 423, 424 and 606 of the IDOT Standard Specifications.
- B. Commercial entrances shall require high-early strength concrete mix.
- C. Concrete may be placed using slip form technique.
- D. Ensure reinforcement, inserts, embedded parts, and formed joints are not disturbed during concrete placement.
- E. Place concrete continuously over full width or panel and between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.7 JOINTS

- A. Place expansion joints using joint filler in accordance with IDOT Standards. Place joint filler between paving components and building or other appurtenances.
- B. Align curb, gutter, and pavement joints.
- C. Install tie bars and dowel bars in accordance with Section 420 and 606 of the IDOT Standard Specifications.
- D. Jointing shall be performed by hand tools or saw-cutting. Jointing tools and equipment must provide minimum joint depth as specified by ACI requirements.
- E. If method of jointing is saw-cutting, Contractor shall perform saw-cutting operations as soon as possible following curing process, without damaging new concrete.

3.8 COMBINATION CONCRETE CURB AND GUTTER

- A. Work shall include placement of two (2) #4 continuous reinforcing bars as shown on the detail sheet along the full length of the new curb and shall have polyurethane coated fiber in the mix. The fiber shall be mixed in the concrete at a rate of 1.5 lbs per cubic yard of concrete at the ready-mix plant, not at the job site.
- B. Work shall include transition back from depressed curb to existing curb type.

3.9 INSTALLING DETECTABLE WARNINGS

- A. Set panels into wet concrete at locations as shown on the drawings. Press panels into concrete to match top of concrete elevation. Do not over depress.

B. Clean any wet concrete off panel surface.

3.10 FINISHING

A. Sidewalk Paving: Broom finish. Edge sidewalk to 1/2-inch radius. Trowel joint edges.

B. Curbs and Gutters: Broom finish.

C. Direction of Texturing: Transverse to pavement direction.

D. Place curing compound on exposed concrete surfaces immediately after finishing.

3.11 JOINT SEALING

A. Separate pavement from vertical surfaces with 1/2-inch thick joint filler.

B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

C. Extend joint filler from bottom of pavement to within 1/8-inch of finished surface unless otherwise indicated on the plans.

D. Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless requirements that are more stringent apply.

E. Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

F. Provide backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that become wet before sealant application and replace them with dry materials.

G. Install sealants by the following techniques at same time backer material is installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

H. Tooling of Non-Sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below forming smooth, uniform beads; eliminating air pockets; and ensuring contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.

2. Use tooling agents approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
- I. Provide joint sealant configuration complying with sealant manufacturer requirements and of depth and at locations indicated.

3.12 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4-inch in 10 feet.
- B. Maximum Variation from True Position: 1/4-inch.

3.13 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under Provisions of Division 1 and particularly Parts 1.06 and 3.02 of Section 01 40 00. Frequency of test cylinders, slump test, air tests, and documentation shall be as determined by the Engineer.

3.14 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 2 days minimum after finishing and vehicular traffic over pavement for 7 days minimum after finishing.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. CONCRETE APRON, 6" will be measured for payment in place, and the area computed in square yards.
- B. CONCRETE SIDEWALK, 5" will be measured for payment in place and the area computed in square foot. Detectable warnings will not be measured for separately.
- C. M3.12 CURB AND GUTTER will be measured for payment in feet of newly placed curb and gutter.

4.02 PAYMENT:

- A. CONCRETE APRON, 6"
 1. Payment for the Work specified for this item will be made at unit price per square yard measured in place.
 2. Work includes all work in this specification as well as earthwork and 5" of CA-6 compacted stone base course as shown on the plans.

B. CONCRETE SIDEWALK, 5"

1. Payment for the Work specified for this item will be made at unit price per square foot measured in place.
2. Work includes all work in this specification as well as earthwork and 2" of CA-6 compacted stone base course and 6" thickness at all driveways and trench crossings as shown on the plans.

C. M3.12 CURB AND GUTTER

1. Payment for the Work specified for this item will be made at unit price per foot measured in place.
2. Work includes all work in this specification as well as earthwork, 2" of CA-6 compacted stone base course as shown on the plans, and replacement of asphalt required for curb removal and replacement.

--- END OF SECTION ---

**TOPSOIL, SEEDING & MULCH
SECTION 32 92 00**

PART 1 – GENERAL

1.01 SCOPE

A. This Section covers the Work required for the restoration of plain grassy areas impacted by all related infrastructure improvements scheduled for the area involved, and all things necessary for preparing, placing, and maintaining topsoil, seed and mulch in accordance with these Specifications and as shown on the Drawings. All disturbed areas shall be restored with topsoil, seed and mulch. Disturbed areas include those within the fenced limits shown on the plans and all other areas impacted due to construction activities, material storage, and equipment storage. The Work of this Section includes, but is not limited to the following:

1. Preparation of sub-grade to receive topsoil.
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2. Placing, raking and leveling of topsoil as required to prepare for seed and mulch.
3. Placing of seed and mulch.
4. Maintenance of seed and mulch.

1.02 QUALITY ASSURANCE

- A. Work of this Section shall conform to the applicable requirements of the IDOT Standard Specifications Sections 250 and 251, modified as herein specified.
- B. As a measure of the quality of Work to be performed, the Contractor shall be responsible for restoring all disturbed areas to original conditions (as a minimum).

1.03 SUBMITTALS

- A. Contractor shall submit to the Owner's Representative for review prior to procurement of the materials, the brand name and mixture of the seed, and the brand name and chemical composition of the fertilizer.

PART 2 – PRODUCTS

2.01 TOPSOIL

- A. Topsoil for seeded areas shall be 4 inches in thickness as a minimum.

- B. No spreading of topsoil will be permitted until subgrade is approved by the Owner's Representative.
- C. Topsoil shall be a finely pulverized, fertile, friable, rich, black dirt free of lump/clots and without admixture of sub-soil, or any material toxic to plant growth.
- D. Topsoil shall be of uniform quality and free of large roots, stick, hard clay, weeds, brush, stones or other litter or waste products and shall have demonstrate, in its original location, the ability to grow healthy grass.
- E. Topsoil shall not be delivered or spread in muddy or frozen condition.

2.02 SEED

- A. Seed shall be native to the area and shall be in accordance with the applicable requirements of IDOT Standard Specification, Article 250.02.
- B. Seeding Mixture shall be equivalent to IDOT Class 1A, Salt Tolerant Lawn Mixture.
- C. The Contractor shall insure that the proposed grass seed meets the requirements of the IDOT class of seed specified, and shall be produced and tested in the current year, be of good quality, and free of weeds.

2.03 MULCH

- A. Mulch shall be native to the area and shall be in accordance with the applicable requirements of IDOT Standard Specification, Article 251.02.
- B. Mulch shall be applied in accordance with Method 2, in accordance with Article 251.03(b) of the IDOT Standard Specifications.

2.04 FERTILIZER

- A. All fertilizer used shall be a commercial mixture providing a complete plant food and containing nitrogen, phosphorous and potash in the proportions of 5 percent water soluble nitrogen, 3 percent available phosphorous and 2 percent water soluble potash or in other similar proportions approved by the Owner's Representative. The Contractor shall obtain approval from the Owner's Representative of the fertilizer proposed to be used before delivery of the fertilizer to the Work Site.
- B. Fertilizer shall be provided at 180 pounds of fertilizer nutrients per acre applied at a 5:2 ratio as follows:

Nitrogen Fertilizer Nutrient 90 lbs/acre
Potassium Fertilizer Nutrient 36 lbs/acre

- C. All commercial fertilizer (5-3-2) shall be delivered in standard size bags of the manufacturer, showing weight, analysis and name of manufacturer. The fertilizer shall be stored in such a manner that its effectiveness shall not be impaired, and as directed by the Owner's Representative.

PART 3 – EXECUTION

3.01 GENERAL

- A. Restoration of the plain grassy areas shall consist of removing all surplus excavated material; and after suitable settlement time (where settlement may be expected due to other excavation work of these Specifications) then installing (as a minimum) four inch (4") layer of topsoil raked into place and seeding the area to be restored. For all seeded areas, straw mulch shall be placed to retain the seed and water. The Contractor shall be responsible for the maintenance of seeded areas as specified herein.

3.02 PLACING TOPSOIL

- A. Place topsoil in all areas where sodding and planting will be performed. Place to the required depths, up to finished grade elevations.
- B. Use topsoil in relatively dry state. Place during dry weather.
- C. Fine grade topsoil, eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles and contours of subgrades.
- D. Remove stone, roots, grass, weeds, debris and other foreign material while spreading.
- E. Manually spread topsoil around trees, plants, equipment and building(s) to prevent damage which may be caused by grading equipment.
- F. The topsoil shall be feathered to match the existing terrain and adjacent curb or roadway.
- G. Fertilizer shall be applied in accordance with Article 250.04 of the SSRBC.
- H. Lightly compact placed topsoil.

3.03 MAINTENANCE

- A. The Contractor shall furnish all watering equipment for planting and maintenance until Final Payment.
- B. The first watering shall begin within 24-hours of the placement of the mulch. The recommended rate of watering is 3 gallons per square yard every other day until final acceptance by the Engineer, however it is the sole responsibility of the Contractor to make necessary adjustments as to not under or over water.
- C. All seeded areas shall be maintained by the Contractor until the Work is accepted with a minimum maintenance period of 30 days commencing with the completion of seed installation.
- D. Maintenance shall consist of watering (including supplemental watering), mowing, fertilizing, removing weeds and repair of damaged areas due to errant vehicles, severe weather, or other causes as directed by the Owner's Representative.
- E. Erosion, damage or other irregularity requiring repair during the maintenance period shall be made as directed by the Owner's Representative.
- F. When directed by the Owner's Representative, any defective or unsatisfactory Work shall be removed and replaced by the Contractor at the Contractor's expense, if such defective or unsatisfactory Work is determined by the Owner's Representative to be the fault of the Contractor.
- G. Should the seed not germinate because of prevailing cool weather, the period of establishment may be adjusted by the Engineer.
- H. The Village, at its sole discretion, may postpone seeding operations if deemed necessary. In such an event, the completion date may be extended accordingly.
- I. This work shall be completed April 1 to June 15 and August 1 to November 1 in accordance with Article 250.07 of the Standard Specifications.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

- A. Measurement will not be made for the Work specified in this section.

4.02 PAYMENT

- B. Payment for the Work specified in this section will be made at the lump sum price for TOPSOIL, SEEDING, AND MULCH.

--- END OF SECTION ---

DUCTILE-IRON PIPE AND FITTINGS
SECTION 33 05 19

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Provide and test ductile-iron pipe and fittings, as indicated and specified.
- B. Options:
 - 1. For buried exterior pipelines provide push-on joint pipe.
 - a. Provide restrained push-on pipe as indicated and specified.
 - b. Provide either restrained push-on joint fittings as specified and indicated or provide mechanical joint fittings with restraint system as specified herein.
 - 2. For piping exposed as in buildings and galleries, provide flanged or rigid-joint, grooved-coupled pipe and fittings.
 - 3. Cast iron pipe and fittings are not acceptable.

1.2 RELATED WORK:

- A. Section 31 23 16: Earth Excavation, Backfill, Fill and Grading
- B. Section 22 10 00: Process Valves and Appurtenances
- C. Section 22 13 19: Process Piping and Appurtenances

1.3 REFERENCES:

- A. American National Standards Institute, Inc. (ANSI) Standards:
 - 1. A21.4: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

2. A21.10: Ductile-Iron and Gray-Iron Fittings, 3 in. through 48 in., for Water and Other Liquids.
 3. A21.11: Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe Fittings.
 4. A21.15: Flanged Ductile-Iron Pipe with Threaded Flanges.
 5. A21.50: Thickness Design of Ductile-Iron Pipe.
 6. A21.51: Ductile-Iron Pipe, Centrifugally Cast in Metal Molds, or Sand-Lined Molds, for Water or Other Liquids.
 7. A21.53: Ductile-Iron Compact Fittings, 3-in through 16-in. for Water and Other Liquids.
 8. B16.1: Cast-Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, and 800.
 9. B16.21: Nonmetallic Flat Gaskets for Pipe Flanges.
 10. B16.42: Ductile Iron Pipe Flanges and Flanged Fittings.
- B. American Society for Testing and Materials (ASTM) Publications:
1. A307: Carbon Steel Bolts and Studs, 60,000 psi Tensile.
- C. American Water Works Association (AWWA) Standards:
1. C606: Grooved and Shoulder Joints.
- 1.4 SUBMITTALS:
- A. Submit the following in accordance with Section 01 33 00:
1. Piping layouts in full detail.
 2. Location of pipe hangers and supports.
 3. Location and type of thrust blocks.
 4. Large scale details of wall penetrations and special castings.
 5. Schedules of all pipe, fittings, special castings, couplings, expansion joints, and other appurtenances.

- B. Certificates: Sworn and notarized certificates in duplicate of shop tests showing compliance with appropriate standard.
- C. Manufacturer's Literature:
 - 1. Catalog cuts of joints, couplings, harnesses, expansion joints, gaskets, fasteners and other accessories.
 - 2. Brochures and technical data on coatings and lining's and proposed method of application.

1.5 QUALITY ASSURANCE:

- A. Provide in accordance with Section 01 43 00 and as specified.
- B. Inspect and test at foundry according to applicable standard specifications.
- C. Owner reserves right to inspect and test by independent service at manufacturer's plant or elsewhere at his own expense.
- D. Visually inspect before installation.

1.6 DELIVERY, STORAGE AND HANDLING:

- A. Provide in accordance with Section 01 60 00 and as specified.

PART 2 - PRODUCTS

2.1 PIPE:

- A. Ductile Iron:
 - 1. Design conforming to ANSI A21.50.
 - 2. Manufacture conforming to ANSI A21.15 or ANSI A21.51.
 - 3. Thickness class, unless otherwise indicated or specified:
 - a. Minimum Thickness Class 52.
 - b. Minimum thickness Class 53 for use with threaded flanges.
 - c. Minimum thickness Class 53 for use with flanged pipe.
 - d. Minimum thickness for use with grooved couplings conforming to AWWA C606.

2.2 PIPE FOR USE WITH COUPLINGS:

- A. As specified above except ends shall be plain.
- B. With bolted split sleeve couplings, ends cast or machined at right angles to axis.
- C. With grooved type coupling:
 - 1. Ductile-Iron of thickness class specified above.
 - 2. Grooved End dimensions conforming to AWWA C606 for flexible or rigid joints to suit joint requirements.

2.3 FITTINGS:

- A. Provide fittings conforming to ANSI A21.10 or ANSI A21.53, at least Class 150.
- B. Provide all bell push-on or mechanical-joint fittings unless otherwise indicated or specified.
- C. Face and drill flanged fittings conforming to ANSI A21.10 except special drilling or tapping as necessary for correct alignment and bolting.
- D. If flanged fittings are not available under ANSI A21.10 provide fittings conforming to ANSI B16.1 in 125 lb. pressure class.
- E. Provide standard base fittings where indicated.
- F. Provide grooved-end fittings ductile-iron conforming to ANSI A21.10 (AWWA C110) for center-to-face dimensions.
 - 1. End preparation for grooved-ends conforming to AWWA C606 for flexible or rigid joints as required by type of joint.

2.4 NONSTANDARD FITTINGS:

- A. Acceptable design.
- B. Same diameter and thickness as standard fittings.
- C. Manufactured to meet requirements of same specifications as standard fittings except for laying length and types of ends.

2.5 ADAPTERS:

- A. Furnish and install for joining pipe of different types, unless solid sleeves indicated.
 - 1. Provide ends conforming to above specifications for appropriate type of joint, to receive adjoining pipe.
 - 2. Joining two classes of pipe may be of lighter class provided annular space in bell- and-spigot type joints sufficient for jointing.

2.6 JOINTS:

- A. Provide push-on joint and mechanical joint pipe as indicated with necessary accessories, conforming to ANSI A21.11.
 - 1. Provide gasket composition suitable for exposure to liquid within pipe.
- B. Provide pipe flanges and accessories conforming to ANSI A21.15.
 - 1. Provide flat faced flanges.
 - 2. Provide 1/8 in. thick, full faced gaskets suitable for exposure to liquid within pipe.
- C. Provide restrained joint on pipe and fittings where indicated. Provide restrained joint which is:
 - 1. Boltless
 - 2. Capable of being deflected after assembly
 - 3. Designs using set screws or requiring field welding are not acceptable.
 - 4. Manufacturers:
 - a. American Cast Iron Pipe Co. Flex-Ring.
 - b. U.S. Pipe TR FLEX.
 - c. Clow Super-Lock.
 - d. Or acceptable equivalent.

2.7 MECHANICAL JOINT FITTINGS – RESTRAINT SYSTEM

- A. Provide restraint devices for pipe consisting of multiple gripping wedges

incorporated into a follower gland meeting requirements of ANSI/AWWA C110/A21.10.

1. Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, retaining full mechanical joint deflection during assembly and allowing joint deflection after assembly.
2. Provide actuation of the gripping wedges ensured with torque limiting twist off nuts.
3. Provide restraint devices Listed by Underwriters Laboratories (3" through 24" inch size) and Approved by Factory Mutual (3" through 12" inch size).

B. Working Pressure Rating:

1. 16-in and Smaller: 350 psi
2. 18-in and Larger: 250 psi
3. Minimum safety factor of 2 to 1.

C. Materials:

1. Gland body, wedges and wedge actuating components: Grade 65-45-12 ductile iron in accordance with ASTM A536.
2. Ductile iron gripping wedges: Heat treated, 370 to 470 BHN.
3. Provide three (3) test bars incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation in accordance with ASTM E8.
4. Provide chemical and nodularity tests performed as recommended by the Ductile Iron Society, on a per ladle basis.
5. Provide an identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number) cast into each gland body.
6. Record all physical and chemical test results such that they can be accessed via the identification number on the casting. Provide the Material Traceability Records (MTR's) available, in hard copy.

D. Manufacturer:

1. EBAA Iron MegaLug Series 1100 or acceptable equivalent product

2.8 FLANGE ADAPTORS:

- A. Provide restrained flange adaptors for pipe consisting of multiple individual gripping wedges incorporated into a follower gland meeting requirements of ANSI/AWWA C110/A21.10.
 - 1. Provide actuation of the gripping wedges ensured with torque limiting twist off nuts.
 - 2. Provide restraint devices Listed by Underwriters Laboratories (3-in through 12 in size) and Approved by Factory Mutual (4-in through 12-in size).
- B. Joint Deflection capability:
 - 1. 3-in thru 8-in: 5 degrees
 - 2. 10-in and 12-in: 3 degrees
 - 3. 14-in and 16-in: 2 degrees
- C. Provide flange adaptor to maintain seal with and 0.6 inch gap between end of pipe and mating flange
- D. Working Pressure Rating:
 - 1. 16-in and Smaller: 350 psi
 - 2. 18-in: 300 psi
 - 3. Minimum safety factor of 2 to 1.
- E. Materials:
 - 1. Gland body, wedges and wedge actuating components: Grade 65-45-12 ductile iron in accordance with ASTM A536.
 - 2. Ductile iron gripping wedges: Heat treated, 370 to 470 BHN.
 - 3. Provide three (3) test bars incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation in accordance with ASTM E8.
 - 4. Provide chemical and nodularity tests performed as recommended by the Ductile Iron Society, on a per ladle basis.

5. Provide an identification number consisting of year, day, plant and shift (YYDDD)(plant designation)(Shift number) cast into each gland body.
6. Record all physical and chemical test results such that they can be accessed via the identification number on the casting. Provide the Material Traceability Records (MTR's) available, in hard copy.

F. Manufacturer:

1. EBAA Iron MegaFlange Series 2100 or acceptable equivalent product

2.9 FLEXIBLE CONNECTIONS:

A. Provide double-ball flexible expansion joint.

1. Flexible expansion joints shall be manufactured of ductile iron in accordance with ASTM A536 Grade 65-45-12.
2. Each flexible expansion joint shall be capable of deflecting and expanding at the same time.
3. Each ball joint shall possess an external rubber boot to prevent penetration of outside debris.
4. All hardware nuts, bolts and straps shall be type 304 stainless steel.
5. All ductile iron components shall be coated internally and externally with 15 mils of fusion bonded epoxy and shall be holiday testes with a 1500 volt spark test, both of which conform to the requirements of ANSI/AWWA C213.
6. Every flexible joint unit shall be cycled and pressure tested at 350 PSI for 3"-24" and 250 PSI for 30" and above prior to shipment. Flexible expansion joints shall be Star Pipe Products, Starflex Series 5000 or approved equal.

2.10 BOLTED SPLIT SLEEVE COUPLINGS:

- A. Provide in accordance with Section 22 13 19.
- B. Pressure rating at least equal to that of related pipeline.
- C. Provide with gaskets of composition suitable for exposure to liquid within pipe.

2.11 GROOVED COUPLINGS:

- A. Conform to AWWA C606.

- B. Minimum pipe wall thickness specified under "Pipe For Use With Couplings."
- C. Where grooved couplings are indicated to provide for expansion or flexibility, cut pipe grooves to provide necessary expansion or flexibility.
- D. Where grooved couplings are used instead of flanged joints, joint to be of rigid type with pipe grooves cut to bring pipe ends together. Beam strength of joint shall be equal to or greater than that of flanged joint.
- E. Hardware: Type 316 Stainless Steel
- F. Manufacturer:
 - 1. Victaulic Company or acceptable equivalent product.

2.12 FILLING RINGS:

- A. Provide where necessary.
- B. Materials, workmanship, facing, and drilling, conforming to 125-lb. ANSI Standard.
- C. Suitable length with nonparallel faces and corresponding drilling, if necessary, for correct assembly of adjoining piping or equipment.

2.13 CONNECTIONS - TAPPED:

- A. Provide service saddles for all taps for lines 24-inch and smaller.
 - 1. Body: Ductile iron ASTM A395 or Bronze.
 - 2. Straps and Hardware: Type 316 stainless steel.

2.14 GASKETS, BOLTS, AND NUTS:

- A. Provide ring or full face synthetic rubber gaskets for flanged joints and neoprene faced phenolic for insulating gaskets.
 - 1. 1/8 in. thick.
- B. Make flanged joints with:
 - 1. Bolts.
 - 2. Bolt studs with nut on each end.
 - 3. Studs with nuts where flange is tapped.

4. Plastic bolt sleeves and washers for insulating joints.
- C. Number and size of bolts conform to same ANS as flanges.
- D. Provide bolts and nuts, except as specified or indicated, Grade B, ASTM A307.
- E. Provide bolt studs and studs of same quality as machine bolts.
- F. Provide Type 316 stainless steel bolts, washers and nuts in the following areas:
 1. Submerged
 2. Wet Wells
 3. Chemical Area

PART 3 - EXECUTION

3.1 INSPECTION BEFORE INSTALLATION:

- A. Visually inspect.

3.2 HANDLING AND CUTTING:

- A. Mark pipe and fittings "Rejected" and remove from site when cracked or has received a severe blow.
- B. If permitted, cut on sound barrel at a point at least 12 in. from visible limit of crack, at Contractor's expense.
- C. Machine cut with milling type cutters, knives, or saws. Snap cutters, torch, or hammer and chisel NOT ALLOWED. Examine for possible cracks.
- D. Chamfer cut ends if used for push-on joints.
- E. Do not cut polyethelene lined pipes.
- F. Do not cut glass lined pipes.

3.3 INSTALLATION:

- A. Piping Support: Provide in accordance with Section 22 13 13.
- B. Pipe and Fittings:

1. Remove and replace defective pieces.
 2. Clear of all debris and dirt before installing and keep clean until accepted.
 3. Lay accurately to lines and grades indicated or required. Provide accurate alignment, both horizontally and vertically.
 4. Provide firm bearing along entire length of buried pipelines.
- C. No deflection of pipe will be allowed unless specified on the plans or approved by the Engineer.

3.4 JOINTS AND COUPLINGS:

A. Push-on Joints:

1. Insert gasket into groove bell. Apply thin film of nontoxic gasket lubricant over inner surface of gasket in contact with spigot end.
2. Insert chamfered end into gasket. Force pipe past it until it seats against socket bottom.

B. Flanged Joint:

1. Make up tight.
2. Do not put strain on nozzles, valves, and other equipment.

C. Mechanical Joints:

1. Wire brush surfaces in contact with gasket and clean gasket.
2. Lubricate gasket, bell, and spigot with soapy water.
3. Slip gland and gasket over spigot, and insert spigot into bell until seated.
4. Seat gasket and press gland firmly against gasket.
5. After bolts inserted and nuts made finger-tight, tighten diametrically opposite nuts progressively and uniformly around joint by torque wrench. Torque bolts to values specified above.

D. Flexible Connections:

1. Flexible connections shall not be used to correct mis-alignments made during construction, but shall be installed with minimal alignment change

between flanged ends..

E. Grooved Couplings:

1. Clean grooves and other parts.
2. Coat ends of pipe and outside of gasket with soft soap or silicone and slip gasket over one pipe end.
3. Bring pipes to correct position and center gasket over pipe ends with lips against pipe.
4. Place housing sections, insert bolts and tighten nuts until housing sections in metal- to-metal contact.
5. After assembly and inspection and before backfilling, coat exterior surfaces of buried couplings, including bolts and nuts, with heavy-bodied bituminous mastic.

F. Tapped Connection:

1. Drill and tap normal to longitudinal axis.
2. Drilled by skilled mechanics using proper tools.
3. Use only tapered threads.

3.5 TESTING:

A. Clean of all dirt, dust, oil, grease and other foreign material, before conducting pressure and leakage tests.

B. Pressure and Leakage Tests:

1. Conduct combined pressure and leakage test in pipelines in accordance with Section 41-2.14 of the Standard Specification for Water and Sewer Main Construction in Illinois.
2. Furnish and install temporary testing plugs or caps; pressure pumps, pipe connections, meters, gages, equipment, and labor.
3. Test when desired and comply with specifications.
4. Test pipelines in excavation or embedded in concrete before backfill or placing of concrete and test exposed piping before field painting.

5. Fill section of pipe with water and expel air. If hydrants or blowoffs are not available at high points for releasing air, make necessary taps and plug after test completion.
6. Maintain section full of water for 24 hours before conducting combined pressure and leakage test.
7. Conduct pressure and leakage test consisting of first raising water pressure (based on elevation of lowest point of section under test and corrected to gage location) to pressure in psi numerically equal to pipe pressure rating, but not more than 150 psi.
8. If unable to achieve and maintain specified pressure for two hours with no additional pumping, section fails test. If specified pressure is maintained, the Contractor shall proceed immediately with the leakage test.
9. If section fails pressure and leakage test, locate, uncover, and repair or replace defective pipe, fitting, or joint, at no additional expense. Conduct additional tests and repairs until section passes test.
10. Modify test procedure only if permitted by Engineer.

3.6 TOUCH-UP FIELD PAINTING:

- A. Repair or replace damaged or defective coating areas.
- B. Remove damaged or defective coatings by sand-blast cleaning in accordance with SSPC-SP-6, Commercial Grade, immediately prior to priming.
- C. Before priming, provide surfaces dry and free of dust, oil, grease and other foreign material. Apply approved coating in accordance with valve manufacturer's printed recommendations.
- D. When small areas of coating need touch up, surface preparation may be done with suitable power needle gun to match specified blast cleaning.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the price per foot for DUCTILE IRON FORCE MAIN, 14-INCH.

--- END OF SECTION ---

WASTEWATER PUMPING CONTROL SYSTEM SECTION 33 09 30

PART 1 – GENERAL

1.01 GENERAL SPECIFICATIONS

- A. The intent of this specification is to provide a complete, integrated Pump Control System as described herein. It shall be factory assembled, wired and tested. The manufacturer shall supply AutoCAD schematic drawings complete with a bill-of-materials and catalog cut sheets for submittal purposes. AutoCAD as-wired drawings shall be supplied upon completion of construction. Two (2) copies of these drawings shall be provided inside the pump control panel for installation assistance. An equipment data tag shall be permanently affixed on the inside of the exterior door with the station designation, power source, pump horsepower, pump full load amps and the sizes of all fuses utilized in the system. In addition to the label requirements of UL 508A, an engraved legend plate shall be permanently affixed on the inside of the exterior door with the name, address and telephone number of the service representative for the control panel.

The wet well is classified as a Class I, Division 1, and Group D hazardous location per NFPA Article 820. All applicable installation procedures per NEC, ANSI, EPA, and all other codes and laws for this installation requirement shall be followed. Intrinsically safe barriers shall be provided for the level sensors located in the wet well. All pump and control conduits entering or exiting the pump control panel shall terminate in a vented termination enclosure.

The pump power and level sensor cables will run through conduit and shall terminate in a junction box mounted adjacent to the pump control panel. The conduit between the junction box and control panel will be sealed. The conduit between the wet well and junction box will be sealing with “re-enterable” conduit seal. In this way the control panel and junction box are protected by conduit seal and the pump can be removed and electrically disconnected (at the junction box) without disturbing the control panel seal.

1.02 QUALITY ASSURANCE

- A. The pump control panel shall be supplied and fabricated by a current UL508A listed industrial control panel manufacturer. The panel manufacturer shall show its UL follow-up service procedure file number on submittals. All devices within the panel shall be UL listed and/or recognized where applicable and shall be mounted and wired in accordance with the most current edition of UL508, UL698A and NFPA.

The panel manufacturer shall have a minimum of ten (10) years of experience manufacturing systems specifically for water and wastewater applications. The

Pump Control System shall be fully tested by the factory prior to shipment. It shall include testing of both power and control devices as well as for all control functions. A final inspection shall be performed prior to shipment and a copy of this form shall be provided with the panel.

The Pump Control System described is manufactured by Wunderlich Malec Environmental, Inc., 937 National Avenue, Addison, IL 60101 without substitution.

1.03 SUBMITTALS

A. Compliance Submittals:

1. Submit as specified in Section 01 33 00.
2. Includes, but not limited to, the following:
 - a. Fabrication drawings, front elevation, wiring diagrams, and bills of material for pump control panel.
 - b. Engraving schedule and physical dimensions for nameplates and phenolic overlays.
 - c. Electrical and mechanical connection diagrams for all separately mounted instruments.
 - d. Individual specification or descriptive sheets for instruments and similar major system components to conform to ISA S20.
 - e. Instruction Books:
 - 1) For all instruments, transducers, and similar major system equipment.
 - 2) In addition to the requirements as specified in Section 01 33 00, submit single-page specification sheets for each instrument which lists the type, model number, function, scale, input, actuation, output and other specific features of that instrument.
 - f. Programming and Configuration Records
 - 1) The contractor shall provide complete and thoroughly documented records of the programming and configuration of the PLC and the OIT. PLC documentation shall include a searchable label and a plain-English description of the function of each bit or word of logic used and a description of each

ladder logic rung or equivalent unit of the program. These records shall be furnished in both PDF document format and in the application files used by the software package used to program and configure these PLC and OIT. The software product name, revision number, and vendor shall be specified for each PLC and OIT. The Contractor shall furnish four identical CD-ROMs for each location containing this information and labeled to clearly identify the contents of the CD-ROM and the facility for which it is prepared.

- 2) Records of the adjustable hardware settings such as selector and DIP switches shall be provided. Records of fieldconfigurable software settings for instrumentation shall also be provided, which shall include all settings which differ from the factory default settings. These records may consist of PDF images of the instrumentation manual pages that describe these hardware and software settings with the switch positions and software settings clearly marked. These shall be submitted as PDF images on four identical CD-ROMs for each location containing this information and labeled to clearly identify the contents of the CD ROM and the facility for which it is prepared.

3. The panel layout shall be approved by the Owner.

1.04 Basic Operation

- A. The pumps shall be operated automatically or manually as a pump down, lead/lag, common off system. Each pump shall be controlled primarily through a "Hand-Off-Auto" three position selector switch. Control function requirements are further defined in the control section of these specifications.

1. Position Commands

- a. OFF - In this position the applicable pump will not run under any circumstance.
- b. HAND - In this position the applicable pump shall run without regard for the level sensing commands and will rely on operator discipline to run and stop. The over temperature lock out will be active in this mode.
- c. AUTO - In this position both pumps shall be controlled by level sensing commands. The level sensing equipment will sense the appropriate level in the wet well and initiate start and stop

commands to the pump. The over temperature lock out will be active in this mode.

2. Pump Sequence

- a. LEVEL 5 - High Level Alarm
- b. LEVEL 4 - Start lag pump
- c. LEVEL 3 - Start lead pump; pumps shall alternate on each call
- d. LEVEL 2 - Off; all pumps stop
- e. LEVEL 1 – Low Level Alarm; redundant pump stop

3. Utility Power

- a. Utility power to the panel shall be 120V/240 volts, 4-wire, 3 phase, 60 Hz.

4. Wet Well

- a. The wet well is classified as a Class I, Division 1, and Group D hazardous location as per NFPA Article 820.

PART 2 - PRODUCTS

2.01 CONTROL PANEL

A. Enclosure

A U.L. Listed and NEMA Type 3R rated enclosure properly sized to contain the required components of the control system(s) shall be applied as per the following specifications:

1. The enclosure shall be constructed of 14 gauge 304 stainless steel body and door(s) with continuous stainless steel piano hinge. A drip shield shall be welded on the top of the enclosure; screws to secure the drip shield shall not be allowed. The enclosure shall be suitable for pad mounting as shown on the drawings and shall consist of three separate compartments. Electrical service entrance equipment shall be located in one compartment, high voltage power and control equipment in the second and low voltage control in the third. All hardware shall be corrosion resistant. A 3-point latch with nylon rollers and padlock provisions on handle shall be provided on each compartment. Oil-resistant door

gasketing around all four sides of each opening shall be applied. Painted white enamel steel mounting panel(s) shall be provided for mounting of components.

2. Voltage identification labels and comprehensive Arc Flash Hazard warning labels shall be provided. To maintain the environmental rating of the specified equipment and enclosure, install in the openings only certified or recognized devices with the same integrity as the enclosure, in compliance with the installation instructions of the device.

B. Enclosure Accessories

The enclosure shall also provide for and include the following mechanical and electrical facilities.

1. Inner Swing Panel - Provision of a "dead front" feature shall be provided using a full size hinged inner door to mount all operator devices. Material shall be painted steel with turned down flanges on all four sides for added rigidity. The inner door(s) shall be large enough to fill the entire opening of the enclosure, the screw used to secure the inner swing door mounting hardware to the enclosure shall be UL and NEMA Type 4X rated/listed and shall not violate the environmental integrity of the enclosure. Mounting hardware which penetrates the enclosure and violates the environmental rating of the enclosure shall not be allowed. Quarter-turn latches shall be provided for securing the inner door in the closed position; captive screws are not acceptable. In addition, an inner door handle shall be provided for operator convenience.
2. Condensation Heater - A 200 watt (minimum), 120VAC heater shall be provided to protect the enclosure from the harmful effects of condensation corrosion and low temperatures. The heater shall be complete with an adjustable thermostat. Branch protection shall be provided.

C. High Voltage Section

1. Main Circuit Breaker - A service entrance rated main circuit breaker sized for the incoming power conductors shall be provided for the main power connection. Breaker shall be a molder case, thermal magnetic design with fixed trip and 25kA interrupting rating at 240VAC. Main breaker shall be Square D.
2. Surge Protector - The system shall be protected by a surge protector for the electrical service and shall be capable of handling up to 40kA (8/20us) transient amps per phase. It shall be parallel MOV design and provide protection for transient surges as defined in ANS/IEEE C62.41 and UL1449 without degradation of components. The enclosure shall be

molded UV resistant polycarbonate or equal material. All electrical connections shall be sealed in a UL component recognized epoxy to exclude moisture, dirt and corrosion. Leads shall be color coded and a minimum of 18 inches long. Surge protector shall be Citel M40-600.

3. Lugs - Lugs shall be provided for both incoming service neutral and ground. Lugs shall be suitable for copper and/or aluminum wire.
4. Manual Transfer Switch - A manual transfer switch sized for the incoming service shall be provided. The switch shall consist of two molded case circuit breakers and a mechanical interlock to prevent both breakers from being simultaneously closed. The normal breaker shall be connected to the load side of the automatic transfer switch. The emergency breaker shall be connected to the portable generator receptacle. Manual transfer switch shall be Square D.
5. Generator Receptacle - A portable generator receptacle shall be provided to allow emergency connection of the Owner's portable generator. The units shall be a heavy duty circuit breaking receptacle assembly suitable for three phase, four wire service. Receptacle shall be Crouse Hinds AR2041-S22 with AJ78 back box for compatibility with Owner's existing generator.
6. Automatic Transfer Switch - Provide space in the control panel to install an automatic transfer switch provided by the Generator Manufacturer. See Section 26 36 23 – Automatic Transfer Switch for more information.

D. Motor Control Section

1. Branch Disconnect and Short Circuit Protection - Each pump shall have a thermal magnetic circuit breaker and starter sized for the pump motor to be supplied. The starter shall be single speed, NEMA rated and UL Listed, full voltage non-reversing type complete with a solid state overload relay providing Class 10 overload and ground fault protection. The relay shall be set based on the actual pump full load amps and service factor, and not NEC Table 430-150. Auxiliary contacts shall be provided as required by the system.
2. Power Distribution System - Associated with this installation will require the individual branch disconnect and short-circuit protection to have a U.L. interrupting rating of 25 kA at 240 VAC.
3. Control Power - The 120 VAC, single-phase power shall be derived from one leg of the power to neutral.

- a. Control power shall have an overcurrent protection device suitable for the interrupting requirements of the system. Fuses and branch circuit breakers shall be provided in accordance with NEC and the system requirements. UL489 applications shall be met utilizing circuit breakers. Fuses are acceptable as supplementary protection.
 - b. Provide branch protection for the sump pump receptacle, a cabinet mounted GFCI receptacle and lights, power for the controls, generator block heater power, generator battery charger power, flow transmitter power, valve vault lights, valve vault receptacle power, meter vault receptacle power, and two spare breakers.
4. Three Phase Power Monitor – A U.L. recognized three-phase power monitor shall interrupt the control power in the event of phase loss, phase reversal, low voltage and phase unbalance. It shall have primary fuse protection. Contacts shall be rated for 15A resistive at 120VAC. The three-phase power monitor shall automatically reset when proper power is re-applied.

E. Control Section

1. Components - Operator control devices shall be 30mm, NEMA and U.L. listed for Types 12, 3R, 4 and 4X. Contact blocks shall be self-wiping and color coded bridge type rated at 10A and must have a rated insulation of 600V. Pilot lights shall be full voltage, push-to-test type with LED lamps. Terminal connections shall be suitable for two 14 AWG control wires. All control and time delay relays shall be DPDT minimum, rated 10A @ 120VAC, socket mount type. Sockets shall have pressure plate terminals that accept two 14AWG wires and shall be rated a minimum of 300V. All terminal blocks supplied shall be box lug type rated at the proper voltage/ampereage and shall accept two 14AWG wires.

All control wiring shall be minimum 16 AWG, MTW and shall be color coded in accordance with all applicable codes and laws, spiral wrap, tie wrap, fasteners and wire duct shall be provided as required for aesthetics and safety.

All components mounted on the door shall be wired with insulated connectors (where "finger proof" terminals are not provided) to prevent accidental shock hazards. All components on the back panel shall be mounted on DIN rail or fastened via drilled and tapped screws to facilitate easy component replacement. Pop rivets shall not be allowed. Ammeter loops shall be provided between the disconnect switch and combination starter for better heat dissipation and an easy means of meter readings.

2. Mode Select - Method of operation shall be by a three position maintained "Hand-Off-Auto" selector switch for each pump which shall provide for mode selection. A running and overload trip pilot light shall be provided for each pump.
3. Pump Thermal Trip and Seal Leak Detection - Seal leak and over temperature monitoring relays specifically designed to interface with the pump monitoring system shall be supplied by the pump manufacturer for mounting in the control panel. One relay shall be provided for each pump. The relays shall monitor the shaft seal and stator temperature of the pump motor. Over temperature shall be detected by a low temperature switch mounted on the stator. An over temperature condition will cause immediate shutdown and the pump shall remain locked out until manually reset. The over temperature function shall incorporate a bistable relay that retains its position during power failures. Detection of a seal leak occurring within the motor chamber shall not shutdown or lockout the pump. Pilot lights (two each pump) shall indicate a thermal trip or seal leak condition.
4. Elapsed Time Meter - Digital non-resettable type hour meters shall be provided for each pump to record hours of operation and labeled accordingly. These shall be wired with insulated connectors to prevent accidental shock hazards.
5. Pump Current - The wiring circuits for each pump shall include a module to indicate the ampere draw of the pump, NK Technologies AT Series, AT0-420. The current transmitter shall provide a 4-20 mAdc output to the PLC that will indicate the pump ampere draw. The PLC logic shall compare the pump ampere draws with an operator adjustable set point and provide an alarm if the current is outside normal conditions. It is the intention of the current monitoring to alarm a pump problem prior to failure of the pump.
6. Intrinsically Safe Barrier - Intrinsically Safe Barriers will be provided per Article 504 of the N.E.C. and ANSI/ISA-RP12.6. Barriers shall be interfaced with each float switch and the submersible level transmitter. Intrinsically safe relays for each wet well float shall be PR Electronics, Part No. 5202B2. Intrinsic Safety Barriers for the wet well level transducer shall be PR Electronics Part No. 5104BB2B to match Owner's existing equipment.
7. Convenience Outlet - A 15A GFI duplex outlet shall be provided. It shall be mounted on the inner swing door. A dedicated 15A circuit breaker shall be provided for this outlet.
8. Level Controls

- a. Controller - The pump controller shall consist of a Programmable Logic Controller (PLC) and Operator Interface Terminal (OIT) to control normal operation of the lift station. Acceptable products for the PLC processor, power supply, input / output modules, and communication modules are Allen Bradley CompactLogix 5370-L3 1769-L30ER Series and related accessories, no substitutions allowed. The PLC shall be furnished fully programmed by the controls supplier. Programming shall utilize the designated software, Version V21 or higher. The programming and configuration files specific to the pump station shall be furnished, fully documented to the satisfaction of the Owner, on two CD-R. Acceptable manufacturer for the OIT are Automation Direct C-more EA7-T8CCCFL-Full with compatible power supply, no substitutions allowed.

The operator interface shall display wet well level, operating status of the pumps, lift station discharge flow rate, and all active alarm conditions. The OIT shall also be able to support the following:

- 1) Display trends of level, flow, and on/off status for each pump on a single screen.
 - 2) Display history of run time for each pump and total flow for most recent 7-day period
 - 3) Have a first screen PIN-number entry screen to disable lift station entry alarms with 1-minute time delay.
- b. Float Backup Controller - A float backup controller shall be provided to control the pumps in event of failure of the primary level controller. The control system shall be relay/timer based to allow ease of maintenance. A selector switch shall be provided to enable the operator to select float or transducer control. Float-based automatic pump control shall be activated when the high alarm float is tripped or the "heartbeat" pulse output from the PLC is lost for more than 1 minute. When backup control is active, a pilot light shall indicate the condition.

The float controller shall include a selector switch which will allow the operator to select either pump as the lead pump or allow automatic alternation of the pumps each pumping cycle. An override circuit to start the second pump should the first pump fail shall be provided.

- 1) Alarms - A weatherproof red flashing incandescent alarm light and a horn rated 90dB at ten feet shall be provided to indicate a high level alarm condition. Alarm power shall be derived from the 120V control power. They shall be mounted on the exterior of the Pump Control Panel and shall be UL recognized for NEMA 4 to maintain the environmental rating of the enclosure. The horn shall be furnished with a disconnecting means.

9. Ethernet switch, Hirschmann Spyder 5 port.

10. Alarms – The following alarm conditions shall be indicated on the OIT and transmitted to the SCADA system. Other station alarms are transmitted to the SCADA system independent of the pump control panel.

- a. Pump 1 fail (motor starter overload and pump protection relay overload and seal failure conditions)
- b. Pump 1 fail (motor starter overload and pump protection relay overload and seal failure conditions)
- c. High wet well level alarm
- d. Low wet well level alarm
- e. Float control system activated
- f. Power failure
- g. Pump chamber lid opened - Hard-wired sensing switch shall be installed
- h. TBE panel door(s) opened, Hard-wired sensing switches shall be installed
- i. Valve vault chamber lid(s) opened – Hard-wired sensing switch shall be installed
- j. Meter vault chamber lid opened – Hard-wired sensing switch shall be installed
- k. Valve vault flooding, float to be installed
- l. Meter vault flooding, float to be installed
- m. On-off status of all pumps

- n. Check valve flow confirmation by counterweight arm movement – Hard-wired switches shall be installed.
 - o. Generator alarms: The control panel shall be designed and the OIT shall be capable of indicating the following alarm conditions of the possible existing, or potential future generator:
 - 1) Generator enclosure opened, Hard-wired sensing switch shall be installed
 - 2) Generator running
 - 3) Generator general failure
 - 4) Generator ready to run
 - 5) Generator fuel level (as a 4-20mA signal)
 - 6) Generator fuel tank containment failure
11. SCADA and Modem. Local controls shall be set up to provide SCADA communication and data set equivalent to the existing SCADA link, plus transmitting the wet well level and discharge flow rate real-time data. Integration of the pump station local controls and supply of the cable modem shall be by the Village's system integrator under a separate contract. The following list of integer value data shall be calculated by the PLC for reading by the public works master SCADA system:
- a. Scale Station Flow 0-1000 GPM
 - b. Gen Runtime
 - c. Pump 1 Run time Divide value by 12 to get Minutes
 - d. Pump 2 Run time Divide value by 12 to get Minutes
 - e. Scaled Wet Well Level 0-30' (0-300)
 - f. Pump 1 ampere draw
 - g. Pump 2 ampere draw
 - h. Scaled Fuel Level 0-15"

- i. Scaled Station Temperature 0-120 F
- j. Total Flow Scaled in 1000's of Gallons
- k. From HMI: High Level Alarm Setpoint
- l. Trend Value for Level
- m. Trend Value for Pump 1 Run
- n. Trend Value for Pump 2 Run
- o. Pump 1 Vibration Warning
- p. Pump 1 Vibration Excessive
- q. Pump 2 Vibration Warning
- r. Pump 2 Vibration Excessive

F. Instrumentation

1. Submersible Level Transmitter - The level transmitter shall be a hydrostatic pressure unit immersed in the wet well. The housing and the diaphragm shall be of 316 stainless steel. The transmitter shall be supplied with 40 feet of oil resistant steel-reinforced PVC cable. The transmitter shall be 12-30 V DC loop powered providing a 4-20 mA output proportional to level. The transmitter shall be barometrically compensated via a rigid breather tube connected to a panel mounted sealed breather system. Measuring range shall be 0-30 ft. Accuracy shall be 0.5% of full scale. The level transmitter shall be Measurement Specialties 750 to match Owner's existing equipment. The support wire shall be 304 stainless steel aircraft cable and a 15# PVC coated weight shall be attached to cable to hold the switches in place in sump.
2. Float Switches - Sealed non-mercury float switches shall be provided and installed. Floats shall be installed as shown on the plans. The float switches shall be sealed in a corrosion-resistant, Teflon coated, stainless steel housing having a minimum 5" diameter. The support wire shall be 304 stainless steel aircraft cable and a 15# PVC coated weight shall be attached to cable to hold the switches in place in sump. The assembly shall be designed so that levels can be changed without entering the wet well. The float switches shall hang in the sump supported only by the cord that is held to the NEMA 4 junction box or the control panel pedestal.

Three float switches shall be used to control level. Two for pump turn-on and one for pump turn-off. Two float switches shall be provided for alarm.

3. Electromagnetic Flow Meter - Electromagnetic flow meter shall be installed on the discharge piping in the meter pit as shown on the drawings.
 - a. Flow meter shall be 6-inch diameter to match the size of the discharge piping. The flow meter sensor shall be mounted to the meter tube. Flow meter shall be Siemens Sitrans FM MAG 5100 W 7ME6520. Meter shall be suitable for operation under continuous submergence conditions. Flow meter transmitter shall be Siemens Sitrans FM MAG 5000 and shall be mounted in the Traffic Box Enclosure in the same TEE compartment as the Pump Control Panel. Accuracy shall be 0.4%. Transmitter shall have alphanumeric display in English and shall indicate station flow rate in gallons per minute and totalized flow in 1000 gallons. Transmitter shall provide a 4-20mA output signal to the PLC for station flow rate and totalized flow. Provide sufficient length of meter manufacturer recommended cable to connect meter sensor to the pump control panel and potting kit for terminal box.
 - b. Furnish space flanged end spool (length to match length of flow meter) to be installed when meter is removed for service. Contractor shall set pipe spool in place to verify fit, then replace with the flow meter as the final installation.

G. Accessories

1. Mounting Pad - The pump control panel shall be arranged for mounting on a reinforced concrete equipment pad. The overall dimensions of the equipment pad shall be as shown on the Drawings and provide a minimum of approximately 6 inches larger than the base of the panel. Concrete for the equipment pad shall be in accordance with the applicable requirements Specified in Section 03 00 00 and as shown on the Drawings. The concrete pad shall be arranged for electrical conduit entry to the panel as required.
2. Terminal Box and Cable Protector - A terminal box shall be provided adjacent to the control panel for connection of the level sensors and pumps. It shall contain tubular screw type terminal blocks for level sensor, float switches, pump power and control leads. In addition, it shall include a barrier to separate the power and intrinsically safe circuit provisions per NEC Article 504 of and ANS/ISA-RP12.6. The terminal box shall be sized for the application, fabricated of 304 stainless steel, rated NEMA 4X and include a padlockable handle.

The terminal box shall be mounted atop a cable protector. The cable protector shall be fabricated of 304 stainless steel and shall be a minimum of 20" height with width and depth matching the terminal box. The door and sides of the cable protector shall be diamond pattern, expanded 304 stainless steel with 75% open area. The door shall include a padlockable handle. Contractor shall provide Kellums type cord grips to support all cables entering the terminal box.

3. Cable Modem - Each panel shall be supplied with a power supply for remote SCADA communications and space for installation of a cable modem supplied by the Owner's SCADA supplier. All SCADA work remote from the pump station will be supplied by the Owner's SCADA supplier under a separate contract with the Owner. Contractor shall coordinate with SCADA supplier to allow access into panel and confirmation of lift station monitoring with central SCADA at Village Public Works.

PART 3 - EXECUTION

A. Installation

1. Cleaning - The control panel shall be cleaned of accumulated debris or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

B. Testing - Submit a complete testing protocol for the control of the lift station. Protocol shall include:

1. Verification of all I/O points
2. Calibration of all transmitters
3. Demonstration of transducer based control.
4. Demonstration of float backup control.
5. Validation of all SCADA communications

C. As Installed Drawings - Five (5) sets of as-installed drawings of all system components shall be submitted to the Engineer after startup and acceptance of the system. Four sets of drawings shall be included in the O&M instructions described below. One set shall be placed inside the control panel.

D. Supervisory Services - The equipment manufacturer shall provide supervisory personnel as follows: one 8 hour day during installation of the pumps, one eight

hour day for equipment start-up and operator training, one 8 hour day for validation of SCADA communications and one 4 hour period after pumps have been operating approximately 30 days for equipment adjustment and additional operator training. The field supervisor shall be a trained employee of the controls integrator.

Personnel shall make the necessary test and adjustments to place the equipment into proper operation. The instructions shall include demonstrations, assistance, and review of the operation and maintenance manual.

- E. Operation and Maintenance Instructions The manufacturer shall provide four complete sets of "Operation and Maintenance Instructions" which shall be bound in hard cover. The instructions shall define the sequence and timing of the necessary controls, valves, pumps, and meters.
- F. Guarantee - All equipment shall be guaranteed for a period of one year from the date of acceptance of the project by the Engineer. During this period of time the pump station shall pump at or above the design flow rate and function in accordance with these plans and specifications.

All adjustments necessary to comply with this guarantee shall be made at the Contractor's expense.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

- A. Measurement will not be made for the Work specified in this Section.

4.02 PAYMENT

- A. Payment for the Work specified in this Section will be made at the lump sum prices for:

1. WASTEWATER PUMPING CONTROL SYSTEM COMPLETE

- a. Includes all work in this Section including the Automatic Transfer Switch specified in Section 26 36 23.

--- END OF SECTION ---

**PUBLIC GRAVITY STORM AND SANITARY SEWER PIPING AND STRUCTURES
SECTION 33 31 11**

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This work shall be done in accordance with the Standard Specifications for Water and Sewer Construction in Illinois, Current Edition, and the Standard Specifications for Road and Bridge Construction in Illinois, Current Edition, except as herein modified.

1.2 SUBMITTALS:

- A. Submit the following in accordance with Section 01 33 00:
 - 1. Piping, couplings, drainage structures and castings.
- B. Manufacturer's Literature:
 - 1. Catalog cuts of pipe, joints, couplings, harnesses, expansion joints, gaskets, fasteners and other accessories.
 - 2. Brochures and technical data on coatings and lining's and proposed method of application.

1.3 QUALITY ASSURANCE:

- A. Inspect and test at manufacturer's facility according to standard specifications.
- B. Owner reserves right to inspect and test by independent service at manufacturer's plant or elsewhere at his own expense.
- C. Visually inspect before installation.

1.4 DELIVERY, STORAGE AND HANDLING:

- A. Provide in accordance with Section 01 60 00 and per manufacturer's requirements.

PART 2 - PRODUCTS

2.1 PIPE:

- A. PVC SDR 26:
 - 1. Pipe design conforming to ASTM D3034

2. Joints conforming to ASTM D3212.

B. PVC C-900

1. All pipe shall meet the requirements of AWWA C-900, UL 1285, CAN/CSA-B137.3 and BNQ3624-250 Standards, as indicated, for potable water transmission mains and for fire protection systems.
2. The gasketed joint shall meet the requirements of ASTM D-3139, and the joint gasket shall conform to ASTM F-477.

C. DUCTILE IRON

1. Conforming to Section 2.1 of Section 33 05 19.

D. GRAVITY PIPE COUPLINGS

1. Couplings shall be non-shear Band Seal Couplings or approved equal.

2.2 DRAINAGE STRUCTURES:

A. INLETS

1. Inlets shall be precast with designed openings or mechanically cored in the field.
2. Inlets shall be Type A per IDOT Standard 602301-04.
3. Yard inlets shall have Type 8 Grate, EJIW 6517 or Neenah R-4340-B.
4. Inlets under depressed curb shall have a Type 10 frame and grate per IDOT Standard 604046-03.
5. Inlets shall be placed on a minimum of 4" of CA-6 bedding.

B. ADJUSTING RINGS

1. No more than 2 precast adjusting rings with 6" maximum height shall be allowed.
2. A minimum of 1 HDPE adjusting ring shall be installed on new structures and shall be 2".
3. All adjustment rings less than 2" shall be HDPE rings. Only one HDPE may be used within precast tolerances.

4. Only HDPE or precast concrete rings are permitted.
5. ½" x 3.5" mastic shall be used between all frames, rings, and structures. Mortar shall be allowed around rings but not in between.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Sanitary Sewer

1. This work shall be done in accordance with Section 30 of the Standard Specifications for Water and Sewer Construction in Illinois, Current Edition, except as herein modified. Pipe bedding, haunching, initial backfill, and trench backfill shall be in accordance with the plans details, shall be placed in accordance with Section 30 and shall be included in the cost of the pipe. Testing for acceptance of sanitary sewers shall be done in accordance with Article 31-1.12 of the Standard Specifications for Water and Sewer Construction in Illinois, Current Edition, Method A (Exfiltration of air under pressure) and Method D (Deflection) shall be used.

B. Storm Sewer

1. This work shall be done in accordance with Section 550 of the Standard Specifications for Road and Bridge Construction in Illinois, Current Edition, except as herein modified. Pipe bedding, haunching, initial backfill, and trench backfill shall be in accordance with the plans details, shall be placed in accordance with Section 550 and shall be included in the cost of the pipe.

C. Drainage Structures

1. This work shall be done in accordance with Section 602 of the Standard Specifications for Road and Bridge Construction in Illinois, Current Edition, and shall include 4" CA-6 stone bedding.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT:

A. Sewer

1. This work will be measured in place in feet regardless of depth. When a sewer enters a manhole or drainage structure, the measurement will end at the inside of the structure.

B. Drainage Structures

1. This work will be measured in place per each structure installed of the type specified.

4.02 PAYMENT

A. SANITARY SEWER, DUCTILE IRON, 18"

1. This work will be paid for at the contract unit price per Foot for SANITARY SEWER, DUCTILE IRON, 18", Trench backfill and the testing for acceptance shall not be paid for separately but shall be considered included in the cost of the sanitary sewer.

B. STORM SEWER, PVC SDR 26, 8"

1. This work will be paid for at the contract unit price per Foot for STORM SEWER, PVC SDR 26, 8", Trench backfill and the testing for acceptance shall not be paid for separately but shall be considered included in the cost of the sanitary sewer.

C. INLET, TYPE A

1. This work will be paid for at the contract unit price per Each for INLET, TYPE A, and shall include the cost of all work described herein including 4" CA-6 bedding and connections to existing storm sewers.

--- END OF SECTION ---